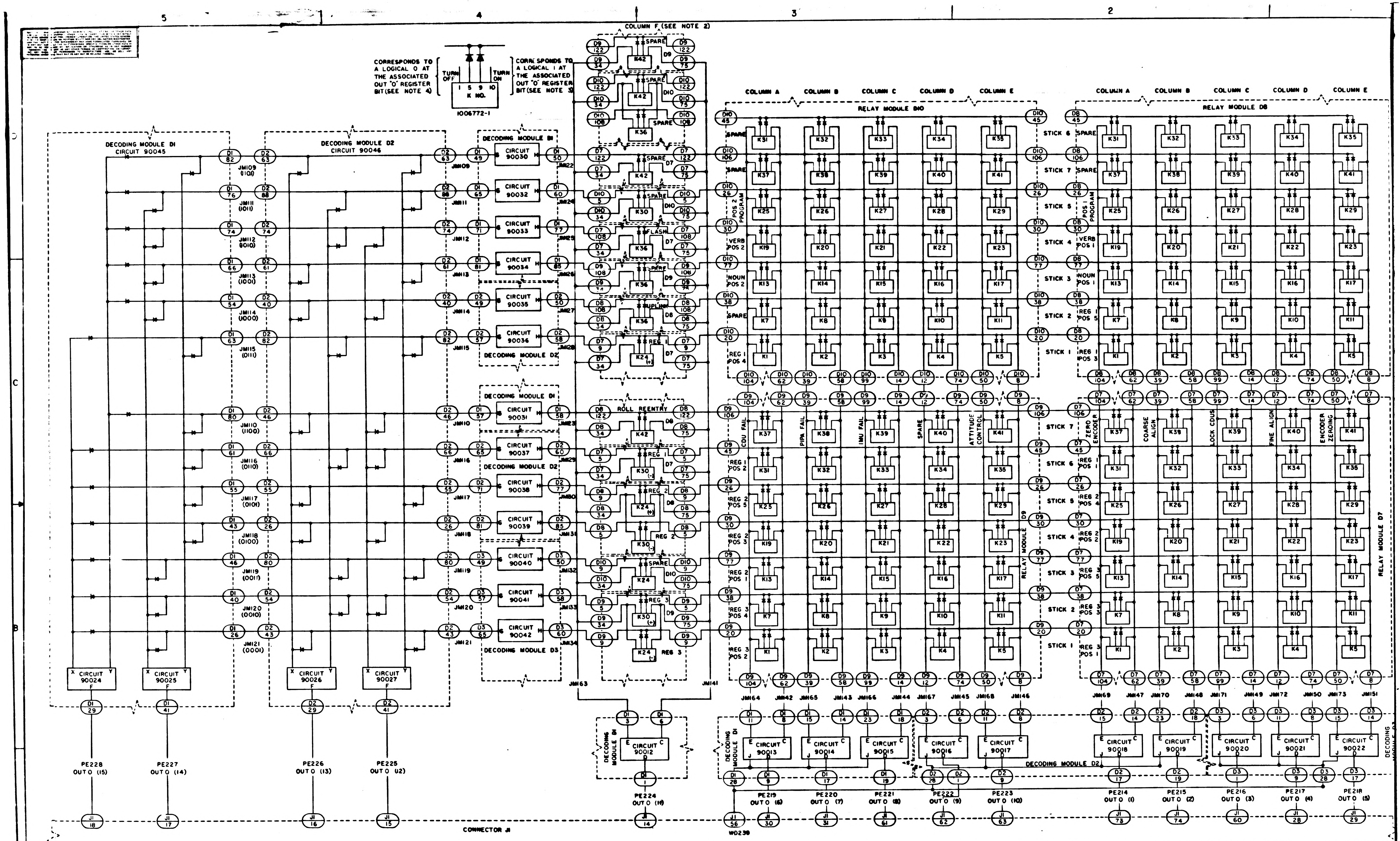
CORRESPONDS TO A LOGICAL 0 AT THE ASSOCIATED OUT "O" REGISTER BIT (SEE NOTE 4)
TURN OFF
1 5 9 10
K NO.
TURN ON
CORRESPONDS TO A LOGICAL 1 AT THE ASSOCIATED OUT "O" REGISTER BIT (SEE NOTE 3)
1006772-1
COLUMN F (SEE NOTE 2)
DECODING MODULE D1
CIRCUIT 90045
DECODING MODULE D2
CIRCUIT 90046
DECODING MODULE B1
DECODING MODULE D2
DECODING MODULE D1
DECODING MODULE D3
CIRCUIT 90030
CIRCUIT 90032
CIRCUIT 90033
CIRCUIT 90034
CIRCUIT 90035
CIRCUIT 90036
CIRCUIT 90031
CIRCUIT 90037
CIRCUIT 90038
CIRCUIT 90039
CIRCUIT 90040
CIRCUIT 90041
CIRCUIT 90042
CIRCUIT 90024
CIRCUIT 90025
CIRCUIT 90026
CIRCUIT 90027
CIRCUIT 90012
CIRCUIT 90013
CIRCUIT 90014
CIRCUIT 90015
CIRCUIT 90016
CIRCUIT 90017
CIRCUIT 90018
CIRCUIT 90019
CIRCUIT 90020
CIRCUIT 90021
CIRCUIT 90022
JM109 (1101)
JM111 (1011)
JM112 (1010)
JM113 (1001)
JM114 (1000)
JM115 (0111)
JM110 (1100)
JM116 (0110)
JM117 (0101)
JM118 (0100)
JM119 (0011)
JM120 (0010)
JM121 (0001)
SPARE
FLASH
UPLINK
REG 1
REG 2
REG 3
ROLL REENTRY
K42
K36
K30
K24
COLUMN A
COLUMN B
COLUMN C
COLUMN D
COLUMN E
RELAY MODULE D10
RELAY MODULE D8
RELAY MODULE D9
RELAY MODULE D7
STICK 7
STICK 6
STICK 5
STICK 4
STICK 3
STICK 2
STICK 1
POS 2 PROGRAM
POS 1 PROGRAM
VERB POS 2
VERB POS 1
NOUN POS 2
NOUN POS 1
REG 1 POS 5
REG 1 POS 3
REG 1 POS 2
REG 1 POS 1
REG 2 POS 5
REG 2 POS 4
REG 2 POS 3
REG 2 POS 2
REG 2 POS 1
REG 3 POS 5
REG 3 POS 4
REG 3 POS 3
REG 3 POS 2
REG 3 POS 1
CDU FAIL
PIPA FAIL
IMU FAIL
SPARE
ATTITUDE CONTROL
ZERO ENCODER
COARSE ALIGN
LOCK CDUS
FINE ALIGN
ENCODER ZEROING
PE228 OUT O (15)
PE227 OUT O (14)
PE226 OUT O (13)
PE225 OUT O (12)
PE224 OUT O (11)
PE219 OUT O (6)
PE220 OUT O (7)
PE221 OUT O (8)
PE222 OUT O (9)
PE223 OUT O (10)
PE214 OUT O (1)
PE215 OUT O (2)
PE216 OUT O (3)
PE217 OUT O (4)
PE218 OUT O (5)
CONNECTOR J1
W0230
DECODING MODULE D2
5
4
3
2
C
B

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. COLUMN F RELAYS OF INDICATED MODULES TO BE LOCATED IN THE FOLLOWING STICKS:
   - K24 – STICK 4
   - K30 – STICK 5
   - K36 – STICK 6
   - K42 – STICK 7
3. A LOGICAL "1" IN OUT O PROVIDES A LOW IMPEDENCE TO GROUND AT THE INDICATED INTERFACE
4. A LOGICAL "0" IN OUT O PROVIDES A HIGH IMPEDENCE TO GROUND AT THE INDICATED INTERFACE
5. OPEN CIRCUIT WHEN INDICATED CODE PRESENT (SEE NOTES 3 & 4)
6. GROUNDED WHEN INDICATED CODE PRESENT (SEE NOTES 3 & 4)

REF DWGS

1. 1006164 – INTERCONNECTION DIAGRAM
2. 1006161 – RELAY MODULE SCHEMATIC
3. 1006162 – DECODING MODULE SCHEMATIC
4. 1006080 – INTERFACE DRAWING
5. 1004252 – SIGNAL PIN ASSIGNMENTS
6. 1006772-1 – RELAY, ARMATURE
7. 1003524 – AGC KEYBOARD & DISPLAY ASSY
8. 1006815-2 – RELAY, ARMATURE

TYPE "C" & "R" CONTROL NETWORK

DECODING LINE (SEE NOTE 5)	RELAY SELECTION LINE (SEE NOTE 6)	RELAY WORD CODE			
		PE228	PE227	PE226	PE225
JM109	JM122	1	1	0	1
JM111	JM124	1	0	1	1
JM112	JM125	1	0	1	0
JM113	JM126	1	0	0	1
JM114	JM127	1	0	0	0
JM115	JM128	0	1	1	1
JM110	JM123	1	1	0	0
JM116	JM129	0	1	1	0
JM117	JM130	0	1	0	1
JM118	JM131	0	1	0	0
JM119	JM132	0	0	1	1
JM120	JM133	0	0	1	0
JM121	JM134	0	0	0	1

NEXT ASSY | USED ON

APPLICATION

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MATERIAL

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FINAL FINISH

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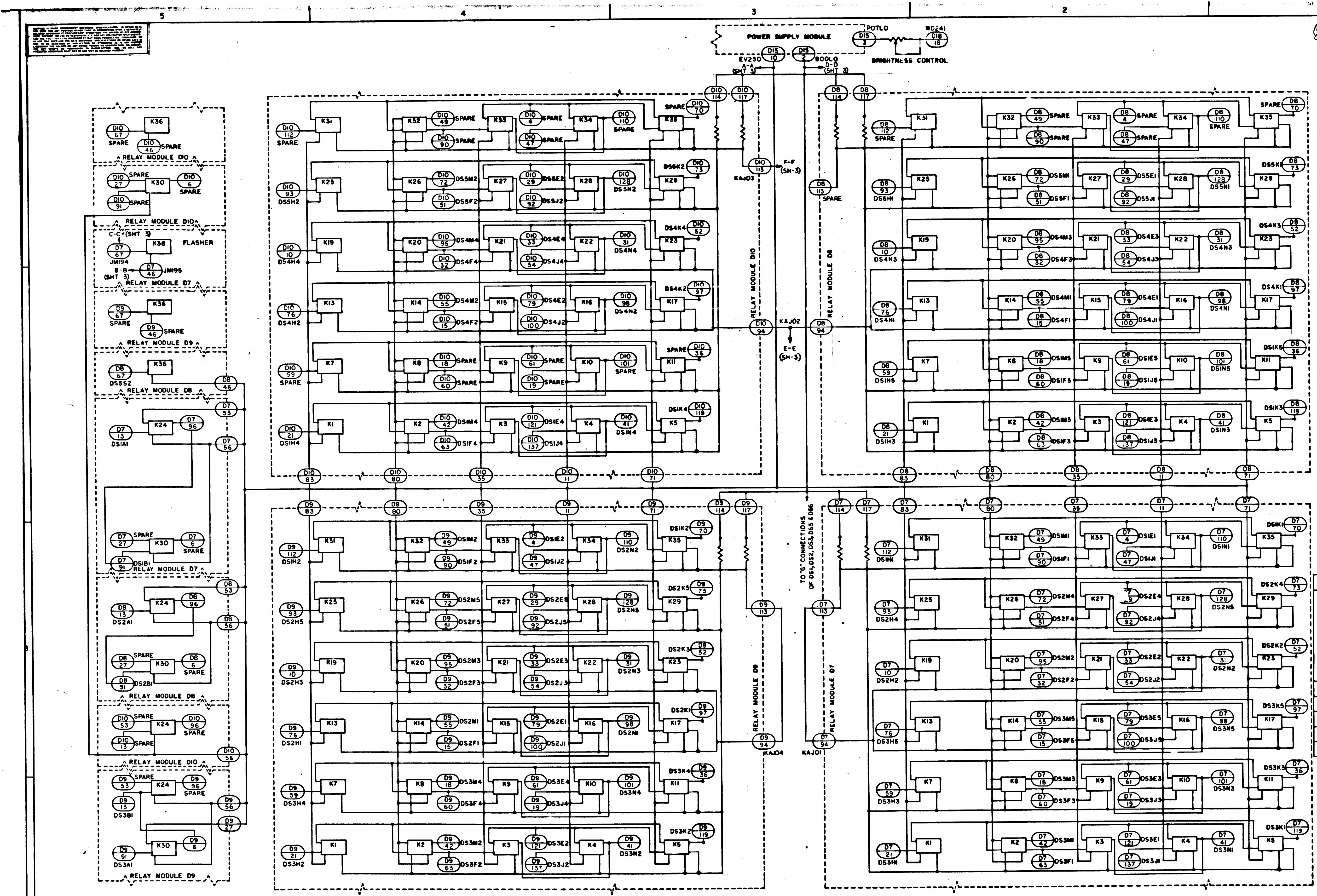
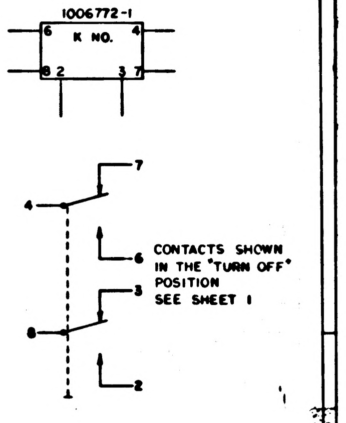
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

[illegible]

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISE PER TDRR 06050		
B	CHARGED PER TDRR 07070 DR CHK		

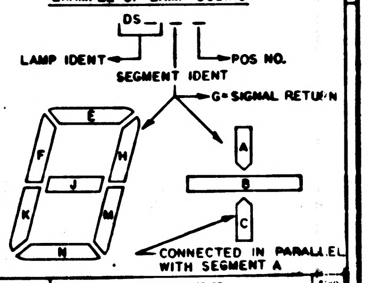

POWER SUPPLY MODULE
D15 3
POTLO
WD241
D18 18
BRIGHTNESS CONTROL
D15 10
D15 2
EV250
A-A (SHT 3)
BOOLO
D-D (SHT 3)
F-F (SH-3)
E-E (SH-3)
KAJO3
KAJO2
KAJO4
KAJO1
RELAY MODULE D10
RELAY MODULE D8
RELAY MODULE D9
RELAY MODULE D7
TO "G" CONNECTIONS OF DS1, DS2, DS3, DS5 & DS6
C-C (SHT 3)
B-B (SHT 3)
FLASHER
JM194
JM195
K36
K30
K24
SPARE
DS5S2
DS2A1
DS2B1
DS3B1
DS3A1
DS1A1
DS1B1

TYPE "R" CONTACT NETWORK


1006772-1
6
K NO.
4
8
2
3
7
4
7
6
3
8
2
CONTACTS SHOWN IN THE "TURN OFF" POSITION SEE SHEET 1

DISPLAY CODE TABLE (SEE NOTE 3)						
INDICATOR DISPLAY	PROG ALM DS6S3				COUNTER FAIL DS6S1	
	RUPT LOCK DS6S6		TC TRAP DS6S5		SCALER FAIL DS6S4	
	PARITY FAIL DS6S9		TL FAIL DS6S8		CHECK FAIL DS6S7	
			KEY RLSE DS6S11			
PROGRAM DISPLAY	UPTL DS5S2	COMP DS5S1			POS 2 DS5_2	POS 1 DS5_1
VERB NOUN	POS 4 DS4_4	POS 3 DS4_3			POS 2 DS4_2	POS 1 DS4_1
REGISTER 1	± DS1_1	POS 5 DS1_5	POS 4 DS1_4	POS 3 DS1_3	POS 2 DS1_2	POS 1 DS1_1
REGISTER 2	± DS2_1	POS 5 DS2_5	POS 4 DS2_4	POS 3 DS2_3	POS 2 DS2_2	POS 1 DS2_1
REGISTER 3	± DS3_1	POS 5 DS3_5	POS 4 DS3_4	POS 3 DS3_3	POS 2 DS3_2	POS 1 DS3_1

EXAMPLE OF LAMP CODING


DS _ _ _
LAMP IDENT
SEGMENT IDENT
POS NO.
G=SIGNAL RETURN
E
F
H
J
K
M
N
A
B
C
CONNECTED IN PARALLEL WITH SEGMENT A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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APPROVAL 3 Jan 64
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INTERCONNECTION FLOW DIAGRAM AGC DSKY NAV

CODE IDENT NO. —
SIZE J
NASA DRAWING NO. 10.06167
SCALE
WT
SHEET 2 OF

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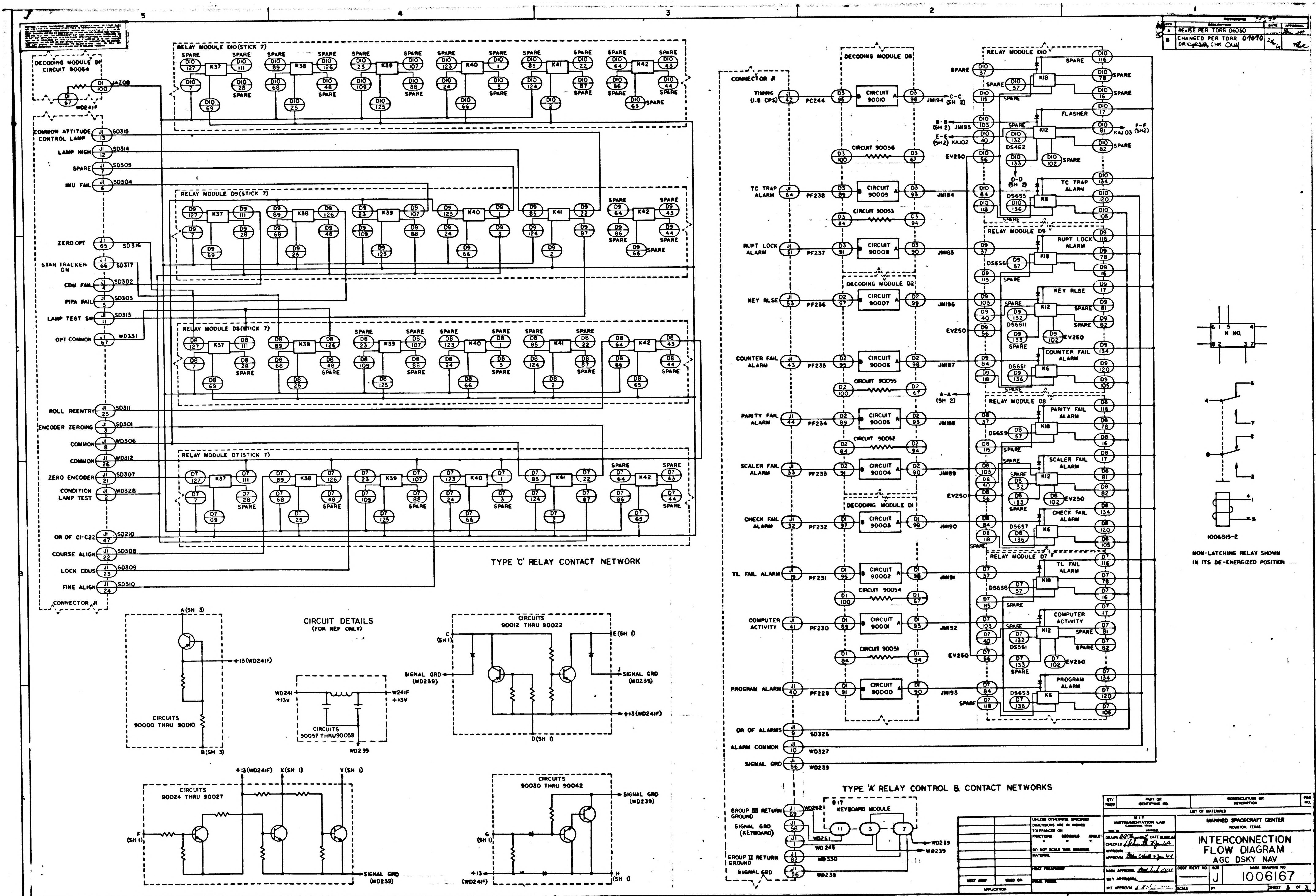
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISE PER TDRR 06050		
B	CHANGED PER TDRR 07070 DR CHK	64	


DECODING MODULE D1
CIRCUIT 90054
JAZ08
WD241F
RELAY MODULE D10 (STICK 7)
RELAY MODULE D9 (STICK 7)
RELAY MODULE D8 (STICK 7)
RELAY MODULE D7 (STICK 7)
K37
K38
K39
K40
K41
K42
SPARE
COMMON ATTITUDE CONTROL LAMP
SD315
LAMP HIGH
SD314
SPARE
SD305
IMU FAIL
SD304
ZERO OPT
SD316
STAR TRACKER ON
SD317
CDU FAIL
SD302
PIPA FAIL
SD303
LAMP TEST SW
SD313
OPT COMMON
WD331
ROLL REENTRY
SD311
ENCODER ZEROING
SD301
COMMON
WD306
COMMON
WD312
ZERO ENCODER
SD307
CONDITION LAMP TEST
WD328
OR OF CI-C22
SD210
COURSE ALIGN
SD308
LOCK CDUS
SD309
FINE ALIGN
SD310
CONNECTOR J1
TYPE 'C' RELAY CONTACT NETWORK
CIRCUIT DETAILS
(FOR REF ONLY)
A (SH 3)
+13 (WD241F)
CIRCUITS 90000 THRU 90010
B (SH 3)
WD241 +13V
W241F +13V
CIRCUITS 90057 THRU 90059
WD239
CIRCUITS 90012 THRU 90022
C (SH 1)
E (SH 1)
SIGNAL GRD (WD239)
J SIGNAL GRD (WD239)
+13 (WD241F)
D (SH 1)
CIRCUITS 90024 THRU 90027
+13 (WD241F)
X (SH 1)
Y (SH 1)
F (SH 1)
SIGNAL GRD (WD239)
CIRCUITS 90030 THRU 90042
G (SH 1)
SIGNAL GRD (WD239)
+13 (WD241F)
H (SH 1)
CONNECTOR J1
TIMING (.5 CPS)
PC244
DECODING MODULE D3
CIRCUIT 90010
JM194
C-C (SH 2)
B-B (SH 2) JM195
E-E (SH 2) KAJ02
CIRCUIT 90056
EV250
TC TRAP ALARM
PF238
CIRCUIT 90009
JM184
CIRCUIT 90053
RUPT LOCK ALARM
PF237
CIRCUIT 90008
JM185
DECODING MODULE D2
KEY RLSE
PF236
CIRCUIT 90007
JM186
COUNTER FAIL ALARM
PF235
CIRCUIT 90006
JM187
CIRCUIT 90055
A-A (SH 2)
PARITY FAIL ALARM
PF234
CIRCUIT 90005
JM188
CIRCUIT 90052
SCALER FAIL ALARM
PF233
CIRCUIT 90004
JM189
DECODING MODULE D1
CHECK FAIL ALARM
PF232
CIRCUIT 90003
JM190
TL FAIL ALARM
PF231
CIRCUIT 90002
JM191
CIRCUIT 90054
COMPUTER ACTIVITY
PF230
CIRCUIT 90001
JM192
CIRCUIT 90051
PROGRAM ALARM
PF229
CIRCUIT 90000
JM193
OR OF ALARMS
SD326
ALARM COMMON
WD327
SIGNAL GRD
WD239
RELAY MODULE D10
K18
FLASHER
K12
F-F (SH2)
KAJ03
DS462
D-D (SH 2)
TC TRAP ALARM
DS655
K6
RELAY MODULE D9
RUPT LOCK ALARM
DS656
KEY RLSE
DS6511
COUNTER FAIL ALARM
DS651
RELAY MODULE D8
PARITY FAIL ALARM
DS659
SCALER FAIL ALARM
CHECK FAIL ALARM
DS657
RELAY MODULE D7
TL FAIL ALARM
DS658
COMPUTER ACTIVITY
DS551
PROGRAM ALARM
DS653
K NO.
1006815-2
NON-LATCHING RELAY SHOWN IN ITS DE-ENERGIZED POSITION
TYPE 'A' RELAY CONTROL & CONTACT NETWORKS
GROUP III RETURN GROUND
WD252
SIGNAL GRD (KEYBOARD)
WD251
WD245
GROUP II RETURN GROUND
WD330
SIGNAL GRD
WD239
B17 KEYBOARD MODULE
WD239
WD239

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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Cambridge, Mass.

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CHECKED 3 Jan 64
APPROVAL
APPROVAL 3 Jan 64
NASA APPROVAL
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INTERCONNECTION FLOW DIAGRAM AGC DSKY NAV

CODE IDENT NO. ——
SIZE J
NASA DRAWING NO. 1006167
SCALE
WT
SHEET 3 OF 3

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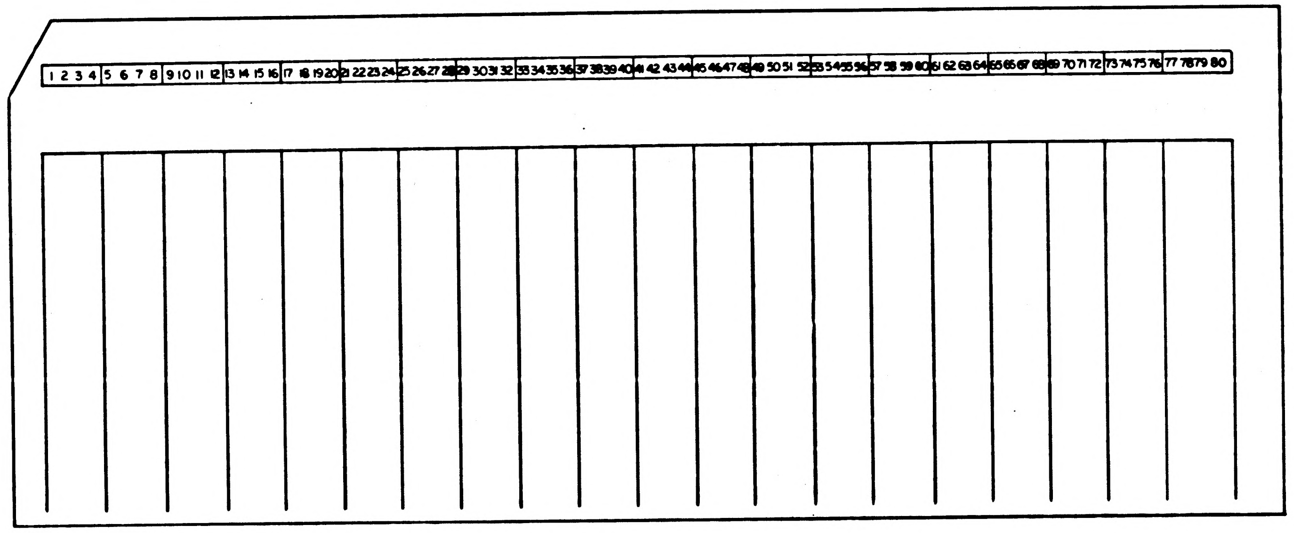
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
Ⓝ	INITIAL RELEASE PER TDRR 07058	3/7/64	WK
A	REVISED PER TDRR 07505	4/14/64	WK



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS / USAGE

CARD COLUMNS	USAGE
3-9	DRAWING NUMBER
12-15	CARD NUMBER
16	PATTERN CODE
17	TABLE ROTATIONAL POSITION
18	A-TOOL Z-LEVEL
19	B-TOOL Z-LEVEL
20-21	A-TOOL X-POSITION
22-23	LOWEST Y IN BOTH UNITS
24-25	B-TOOL X-POSITION
26-27	LOWEST Y IN OTHER UNIT
28-29	HIGHEST Y IN FIRST UNIT
30-31	HIGHEST Y IN OTHER UNIT
32-35	NEXT CARD NUMBER
36-37	A-TOOL X POSITION IN TRP-1
38-39	A-TOOL Y POSITION IN TRP-1
40-41	A-DRESSING FINGER X POSITION IN TRP-1
42-43	A-DRESSING FINGER Y POSITION IN TRP-1
44-45	B-DRESSING FINGER X POSITION IN TRP-1
46-47	B-DRESSING FINGER Y POSITION IN TRP-1
48-49	B-TOOL X POSITION IN TRP-1
50-51	B-TOOL Y POSITION IN TRP-1
70-73	SIGNAL SEQUENCE NUMBER(CKT)
74-75	WIRE COUNTER

REF DRAWING NUMBER: 1003189
1006170

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DRAWN DATE 20 FEB 64
CHECKED 20 Feb 64
APPROVAL
APPROVAL 9 Mar 64
NASA APPROVAL 3/11/64
MIT APPROVAL 17 Mar 64

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WIREWRAP CARD DECK
COMPUTER END CONNECTOR

CODE IDENT NO. ——
SIZE D
NASA DRAWING NO. 1006169
SCALE ——
WT ——
SHEET 1 OF 1

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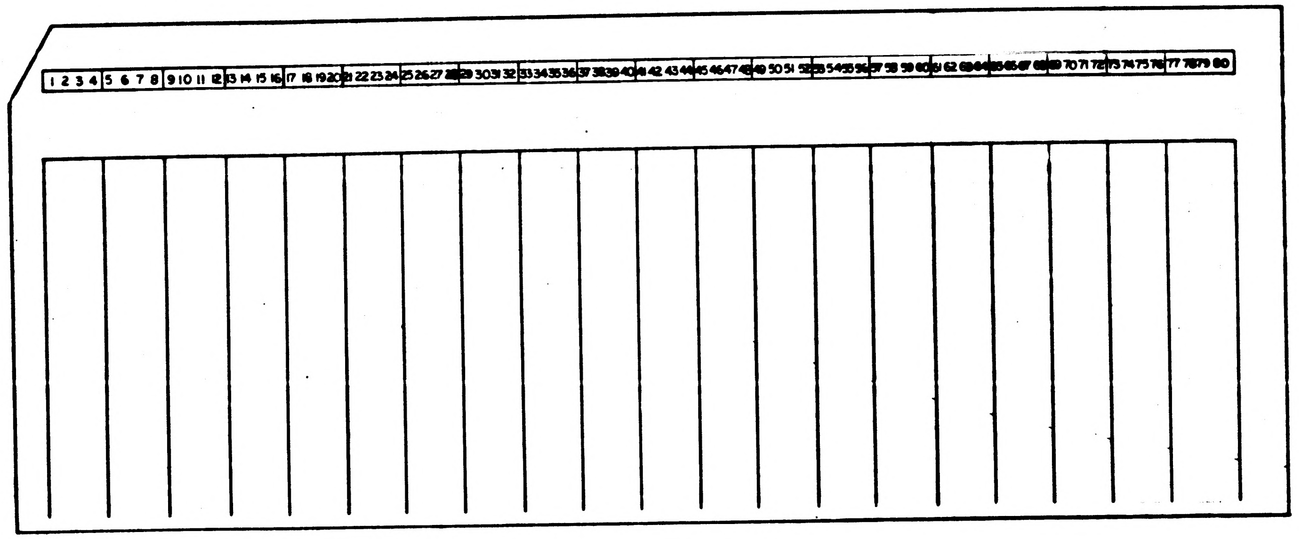
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
	INITIAL RELEASE PER TDRR 07058	3/17/64	WR.
A	REVISED PER TDRR 07505	4/8/64	WR.
B	REVISED PER TDRR 08852 DR R Boudreau CHK A.R.B.	4 Jun 64	HAC



NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS / USAGE

CARD COLUMNS	USAGE
3-9	DRAWING NUMBER
12-15	CARD NUMBER
16	PATTERN CODE
17	TABLE ROTATIONAL POSITION
18	A-TOOL Z-LEVEL
19	B-TOOL Z-LEVEL
20-21	A-TOOL X-POSITION
22-23	LOWEST Y IN BOTH UNITS
24-25	B-TOOL X-POSITION
26-27	LOWEST Y IN OTHER UNIT
28-29	HIGHEST Y IN FIRST UNIT
30-31	HIGHEST Y IN OTHER UNIT
32-35	NEXT CARD NUMBER
36-37	A-TOOL X POSITION IN TRP-1
38-39	A-TOOL Y POSITION IN TRP-1
40-41	A-DRESSING FINGER X POSITION IN TRP-1
42-43	A-DRESSING FINGER Y POSITION IN TRP-1
44-45	B-DRESSING FINGER X POSITION IN TRP-1
46-47	B-DRESSING FINGER Y POSITION IN TRP-1
48-49	B-TOOL X POSITION IN TRP-1
50-51	B-TOOL Y POSITION IN TRP-1
70-73	SIGNAL SEQUENCE NUMBER(CKT)
74-78	WIRE COUNTER

REF DRAWING NUMBER: 1003169
1006170

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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WIREWRAP CARD DECK
COMPUTER END CONNECTOR

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006169
SCALE —
WT —
SHEET 1 OF 1

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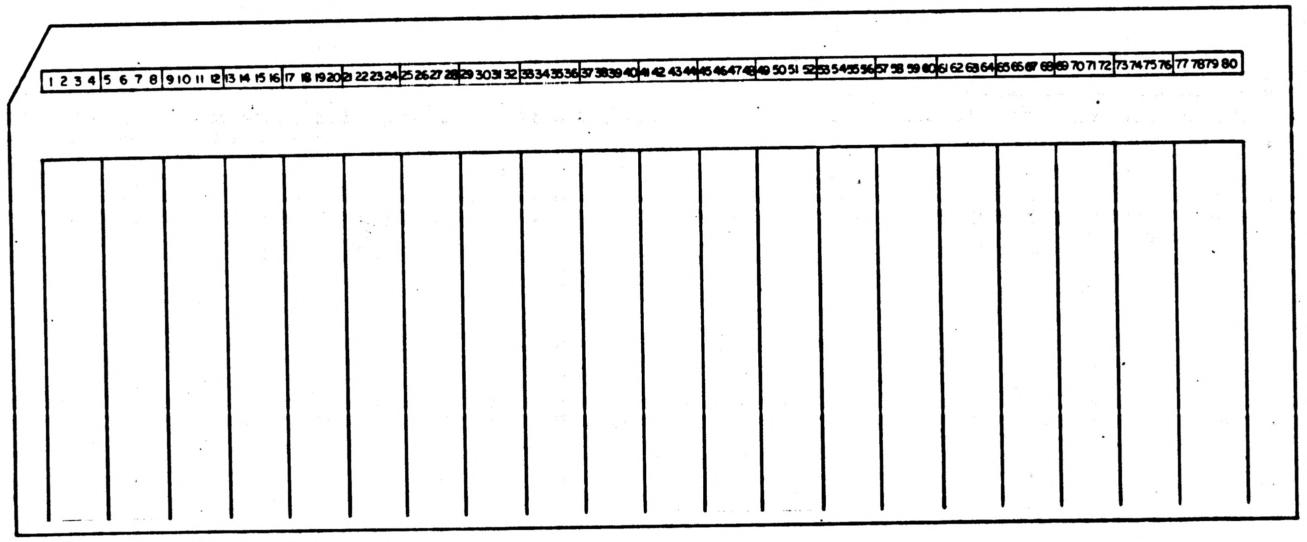
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	INITIAL RELEASE PER TDRR 07058	3/17/64	WK



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2.

CARD COLUMNS	USAGE
3-9	DRAWING NUMBER
12-15	CARD NUMBER
16	PATTERN CODE
17	TABLE ROTATIONAL POSITION
18	A-TOOL Z-LEVEL
19	B-TOOL Z-LEVEL
20-21	A-TOOL X-POSITION
22-23	LOWEST Y IN BOTH UNITS
24-25	B-TOOL X-POSITION
26-27	LOWEST Y IN OTHER UNIT
28-29	HIGHEST Y IN FIRST UNIT
30-31	HIGHEST Y IN OTHER UNIT
32-35	NEXT CARD NUMBER
36-37	A-TOOL X POSITION IN TRP-1
38-39	A-TOOL Y POSITION IN TRP-1
40-41	A-DRESSING FINGER X POSITION IN TRP-1
42-43	A-DRESSING FINGER Y POSITION IN TRP-1
44-45	B-DRESSING FINGER X POSITION IN TRP-1
46-47	B-DRESSING FINGER Y POSITION IN TRP-1
48-49	B-TOOL X POSITION IN TRP-1
50-51	B-TOOL Y POSITION IN TRP-1
70-73	SIGNAL SEQUENCE NUMBER(CKT)
74-75	WIRE COUNTER

REF DRAWING NUMBER 1003169
1006170

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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CONTRACT
DRAWN D.Q. Clemont DATE [illegible]
CHECKED [illegible] 28 Feb 64
APPROVAL
APPROVAL [illegible] 9 Mar 64
NASA APPROVAL [illegible] 3/17/64
MIT APPROVAL [illegible] 17 Mar 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIREWRAP CARD DECK
COMPUTER END CONNECTOR

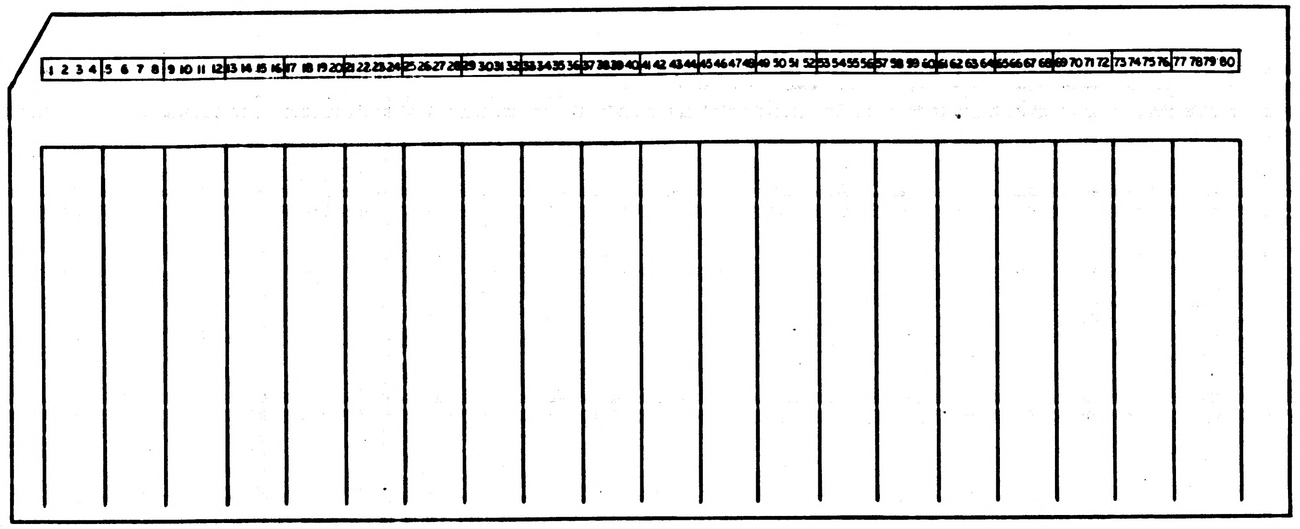
CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006169
SCALE —
WT —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 05629	1/7/64	



NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2.

CARD COLUMNS	USAGE
2 - 5	CARD NUMBER
6 - 7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
18 - 24	SIGNAL NAME
33 - 38	END CONNECTOR PIN NUMBER
42 - 70	NOTES AS REQUIRED
73 - 79	NASA DRAWING NUMBER
80	REVISION LETTER

REF DRAWING NUMBER 1003189

1006170 A

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN L. T. Berkeley DATE 12-26-63
CHECKED
APPROVAL
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL 1/7/64
MIT APPROVAL 1/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPUTER END
CONNECTOR WIRING

CODE IDENT NO. | SIZE D | NASA DRAWING NO. 1006170
SCALE — | WT — | SHEET — OF —

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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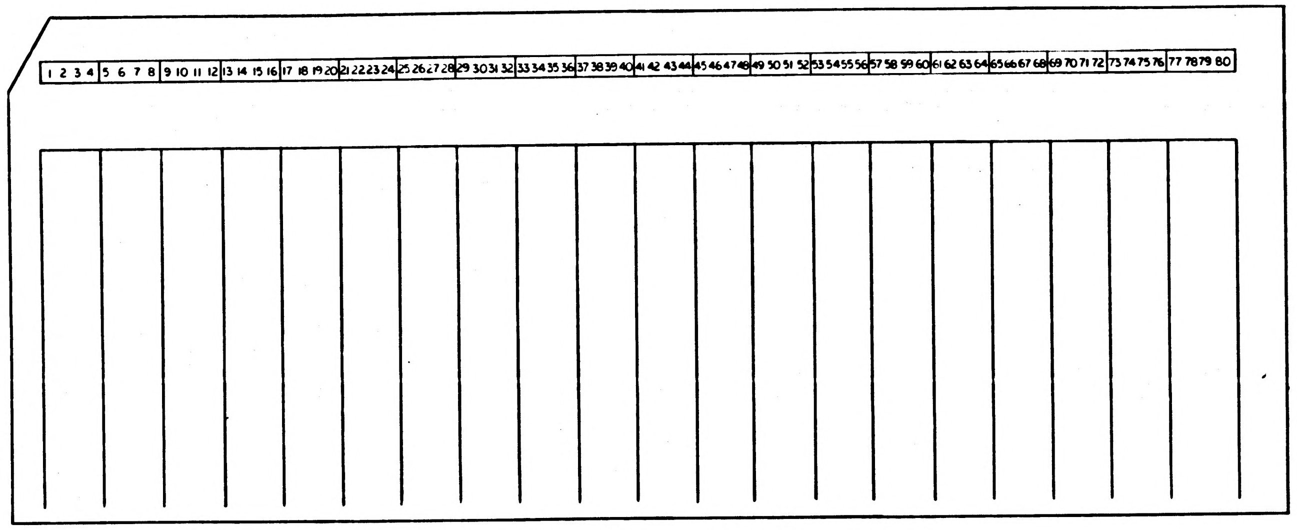
C	REVISED PER TDRR 07508	4/7/64	WK



NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS / USAGE

CARD COLUMNS	USAGE
2 - 5	CARD NUMBER
6 - 7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
18 - 24	SIGNAL NAME
33 - 38	END CONNECTOR PIN NUMBER
42 - 70	NOTES AS REQUIRED
73 - 79	NASA DRAWING NUMBER
80	REVISION LETTER

REF DRAWING NUMBER 1003189

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT
DRAWN L.J. Berkeley DATE 12-26-63
CHECKED
APPROVAL
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPUTER END CONNECTOR WIRING

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006170
SCALE —
WT —
SHEET — OF —

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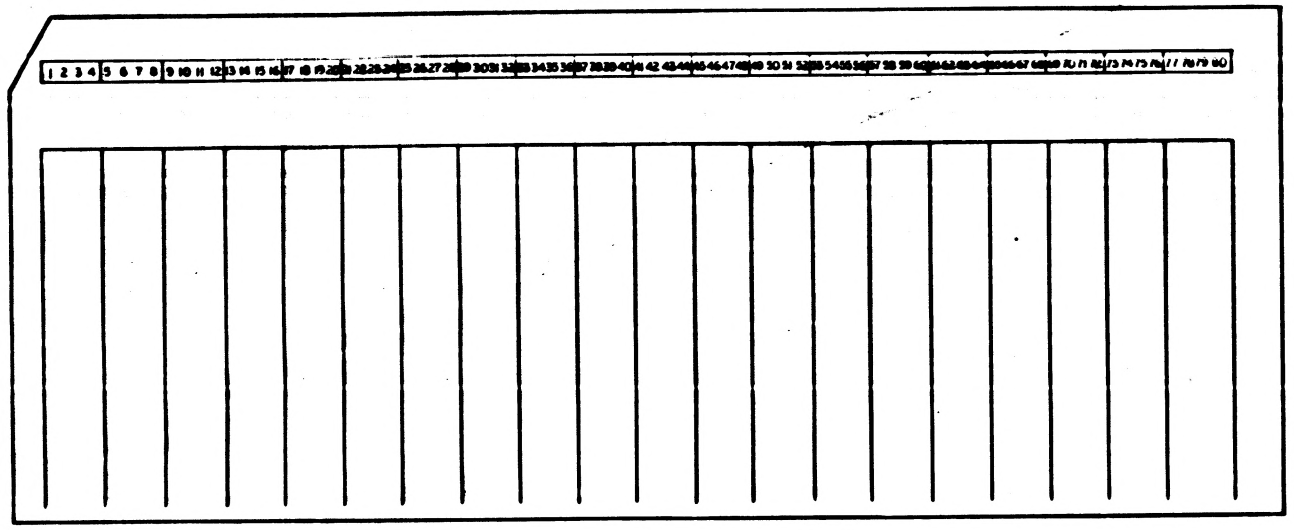
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 05629	[illegible]	[illegible]
B	REVISED PER TDRR 07508	[illegible]	[illegible]
C	REVISED PER TDRR 06855 DR R Bandeau CHK R.H.E.	Jan 64	[illegible]



NOTES:

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2. CARD COLUMNS / USAGE

CARD COLUMNS	USAGE
2 - 5	CARD NUMBER
6 - 7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
18 - 24	SIGNAL NAME
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FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN [illegible] DATE [illegible]
CHECKED
APPROVAL
APPROVAL Eldon C. Hall 7 Jan 64
NASA APPROVAL [illegible] 1/7/64
MIT APPROVAL [illegible] 1/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPUTER END
CONNECTOR WIRING

CODE IDENT NO. —
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SCALE — WT — SHEET — OF —

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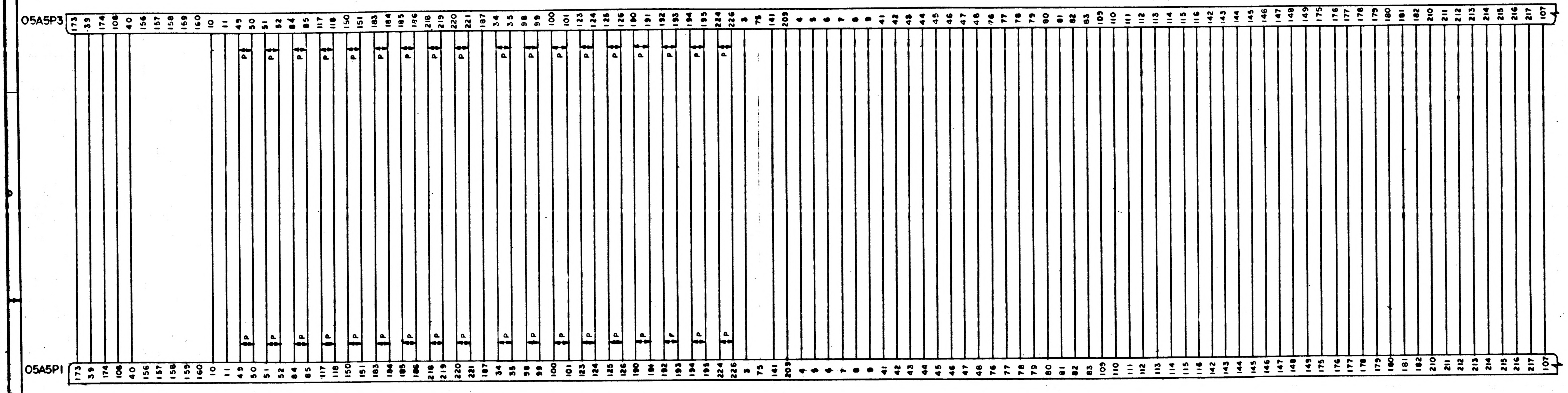
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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P
05A5P1
173 39 174 108 40 156 157 158 159 160 10 11 49 50 51 52 84 85 117 118 150 151 183 184 185 186 218 219 220 221 187 34 35 98 99 100 101 123 124 125 126 190 191 192 193 194 195 224 226 3 75 141 209 4 5 6 7 8 9 41 42 43 44 45 46 47 48 76 77 78 79 80 81 82 83 109 110 111 112 113 114 115 116 142 143 144 145 146 147 148 149 175 176 177 178 179 180 181 182 210 211 212 213 214 215 216 217 107

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

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INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN A. Di Leo DATE
CHECKED D. J. Borden 30 JAN
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

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HOUSTON, TEXAS

WIRING DIAGRAM AGC
05A5P3 – 05A5P1

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006180
SCALE — WT — SHEET 1 OF 1

A	1819001		

REVISIONS 06100			
LTR	DESCRIPTION	DATE	APPROVAL
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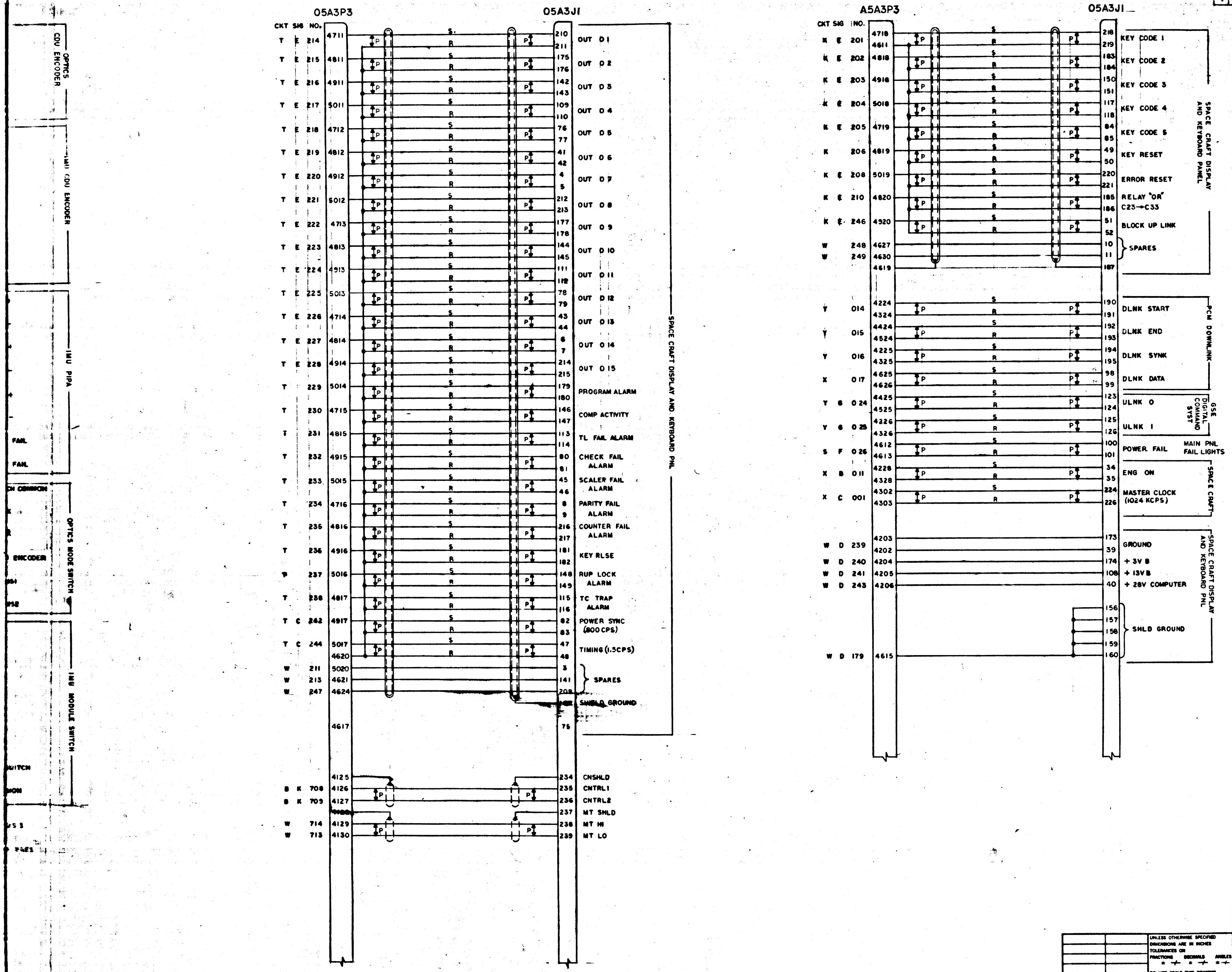
4
3
2
1
D
C
B
A
OPTICS CDU ENCODER
IMU CDU ENCODER
IMU PIPA
FAIL
FAIL
CN COMMON
ENCODER
OPTICS MODE SWITCH
IMU MODULE SWITCH
SWITCH
05A3P3
05A3J1
CKT SIG NO.
S
R
P
T E 214 4711 210 211 OUT 0 1
T E 215 4811 175 176 OUT 0 2
T E 216 4911 142 143 OUT 0 3
T E 217 5011 109 110 OUT 0 4
T E 218 4712 76 77 OUT 0 5
T E 219 4812 41 42 OUT 0 6
T E 220 4912 4 5 OUT 0 7
T E 221 5012 212 213 OUT 0 8
T E 222 4713 177 178 OUT 0 9
T E 223 4813 144 145 OUT 0 10
T E 224 4913 111 112 OUT 0 11
T E 225 5013 78 79 OUT 0 12
T E 226 4714 43 44 OUT 0 13
T E 227 4814 6 7 OUT 0 14
T E 228 4914 214 215 OUT 0 15
T 229 5014 179 180 PROGRAM ALARM
T 230 4715 146 147 COMP ACTIVITY
T 231 4815 113 114 TL FAIL ALARM
T 232 4915 80 81 CHECK FAIL ALARM
T 233 5015 45 46 SCALER FAIL ALARM
T 234 4716 8 9 PARITY FAIL ALARM
T 235 4816 216 217 COUNTER FAIL ALARM
T 236 4916 181 182 KEY RLSE
T 237 5016 148 149 RUP LOCK ALARM
T 238 4817 115 116 TC TRAP ALARM
T C 242 4917 82 83 POWER SYNC (800 CPS)
T C 244 5017 4620 47 48 TIMING (1.5CPS)
W 211 5020 3
W 213 4621 141
W 247 4624 209
SPARES
SHIELD GROUND
4617 75
SPACE CRAFT DISPLAY AND KEYBOARD PNL.
4125 234 CNSHLD
B K 708 4126 235 CNTRL1
B K 709 4127 236 CNTRL2
237 MT SHLD
W 714 4129 238 MT HI
W 713 4130 239 MT LO
A5A3P3
05A3J1
CKT SIG NO.
K E 201 4718 4611 218 219 KEY CODE 1
K E 202 4818 183 184 KEY CODE 2
K E 203 4918 150 151 KEY CODE 3
K E 204 5018 117 118 KEY CODE 4
K E 205 4719 84 85 KEY CODE 5
K 206 4819 49 50 KEY RESET
K E 208 5019 220 221 ERROR RESET
K E 210 4820 185 186 RELAY "OR" C23→C33
K E 246 4920 51 52 BLOCK UP LINK
W 248 4627 10
W 249 4630 11
SPARES
4619 187
SPACE CRAFT DISPLAY AND KEYBOARD PANEL
Y 014 4224 4324 190 191 DLNK START
Y 015 4424 4524 192 193 DLNK END
Y 016 4225 4325 194 195 DLNK SYNK
X 017 4625 4626 98 99 DLNK DATA
PCM DOWNLINK
Y G 024 4425 4525 123 124 ULNK 0
Y G 025 4226 4326 125 126 ULNK 1
GSE DIGITAL COMMAND SYST
S F 026 4612 4613 100 101 POWER FAIL
MAIN PNL FAIL LIGHTS
X B 011 4228 4328 34 35 ENG ON
X C 001 4302 4303 224 226 MASTER CLOCK (1024 KCPS)
SPACE CRAFT
4203 173 GROUND
W D 239 4202 39
W D 240 4204 174 + 3V B
W D 241 4205 108 + 13V B
W D 243 4206 40 + 28V COMPUTER
156
157
158
159
W D 179 4615 160
SHLD GROUND
SPACE CRAFT DISPLAY AND KEYBOARD PNL
1006181 A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
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MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

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CAMBRIDGE, MASS.
DRAWN G. Di Leo
CHECKED D.J. Bowden
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRING DIAGRAM
AGC TO SPACE CRAFT &PSA

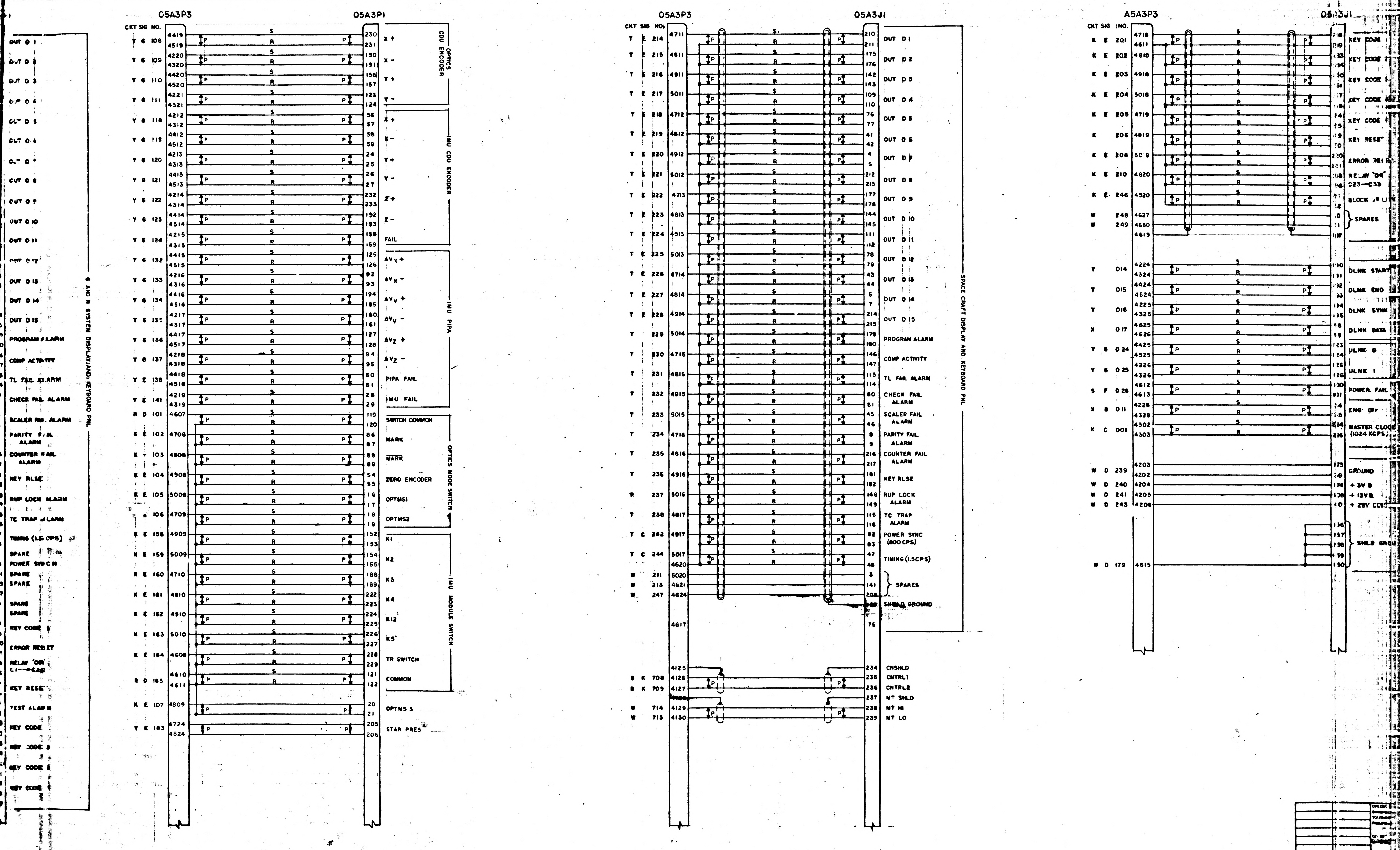
CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	J	1006181
SCALE —	WT —	SHEET 1 OF 1

006181 A

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

E-3

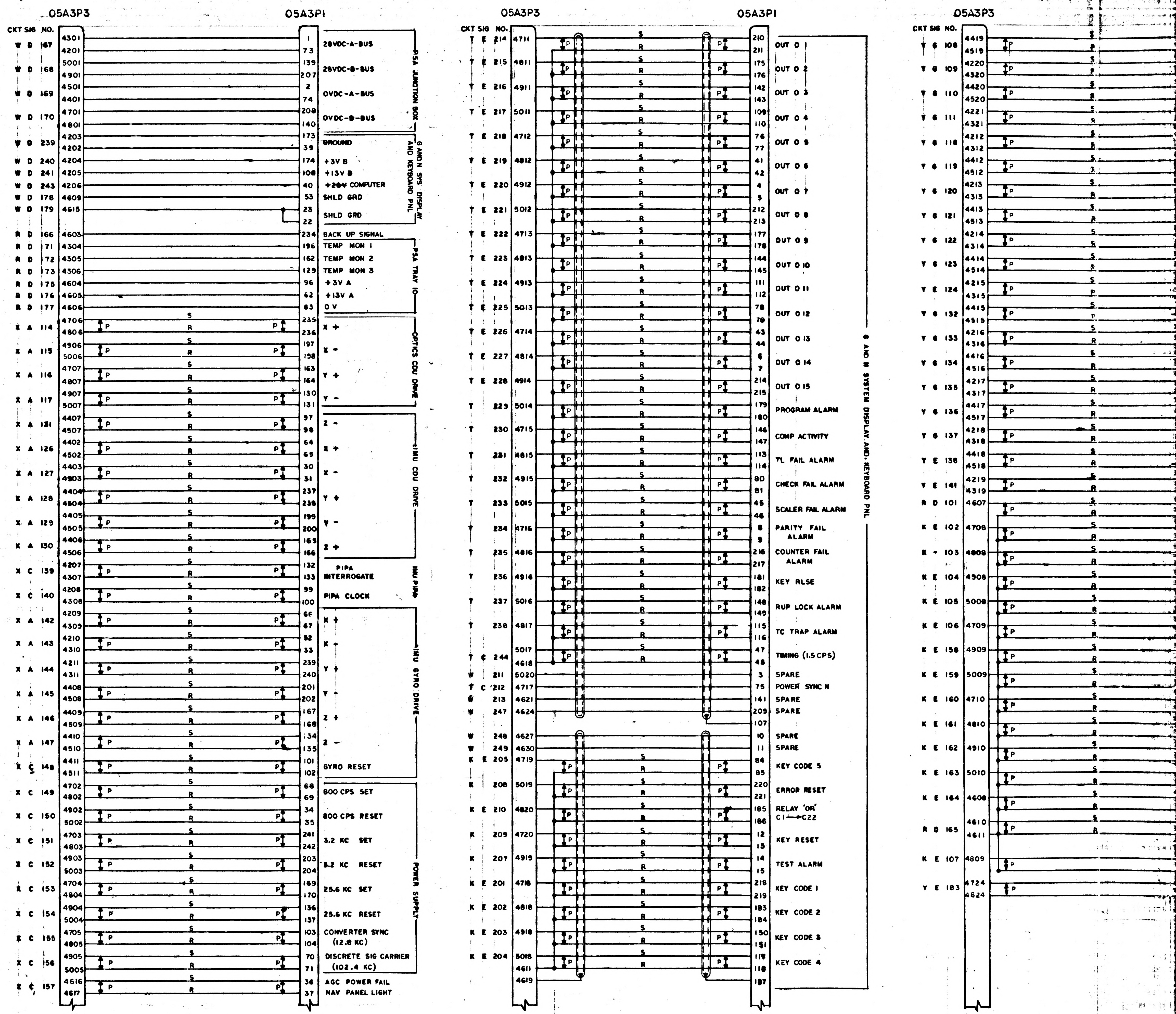

05A3P3
05A3P1
CKT SIG NO.
OPTICS CDU ENCODER
IMU CDU ENCODER
IMU PIPA
OPTICS MODE SWITCH
IMU MODULE SWITCH
X + X − Y + Y − Z + Z − FAIL
ΔVx + ΔVx − ΔVy + ΔVy − ΔVz + ΔVz −
PIPA FAIL
IMU FAIL
SWITCH COMMON
MARK
MARK
ZERO ENCODER
OPTMS1
OPTMS2
K1 K2 K3 K4 K12 K5
TR SWITCH
COMMON
OPTMS 3
STAR PRES
G AND N SYSTEM DISPLAY AND KEYBOARD PNL.
OUT D 1 OUT D 2 OUT D 3 OUT D 4 OUT D 5 OUT D 6 OUT D 7 OUT D 8 OUT D 9 OUT D 10 OUT D 11 OUT D 12 OUT D 13 OUT D 14 OUT D 15
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
TIMING (1.5 CPS)
SPARE
POWER SYNC
KEY CODE
ERROR RESET
RELAY "OR" C1→C22
KEY RESET
TEST ALARM
05A3P3
05A3J1
SPACE CRAFT DISPLAY AND KEYBOARD PNL.
POWER SYNC (800 CPS)
TIMING (1.5CPS)
SPARES
SHIELD GROUND
CNSHLD
CNTRL1
CNTRL2
MT SHLD
MT HI
MT LO
A5A3P3
05A3J1
KEY CODE
KEY RESET
ERROR RESET
RELAY "OR" C23→C33
BLOCK UPLINK
SPARES
DLNK START
DLNK END
DLNK SYNC
DLNK DATA
ULNK 0
ULNK 1
POWER FAIL
ENG ON
MASTER CLOCK (1024 KCPS)
GROUND
+ 3V B
+ 13V B
+ 28V CCI
SHLD GROUND
S R P

1006181 A

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

F-2


05A3P3
05A3P1
CKT SIG NO.
28VDC-A-BUS
28VDC-B-BUS
OVDC-A-BUS
OVDC-B-BUS
PSA JUNCTION BOX
GROUND
+3V B
+13V B
+28V COMPUTER
SHLD GRD
SHLD GRD
G AND N SYS DISPLAY AND KEYBOARD PNL
BACK UP SIGNAL
TEMP MON 1
TEMP MON 2
TEMP MON 3
+3V A
+13V A
0 V
PSA TRAY 10
X +
X -
Y +
Y -
OPTICS CDU DRIVE
Z -
X +
X -
Y +
Y -
Z +
IMU CDU DRIVE
PIPA INTERROGATE
PIPA CLOCK
IMU PIPA
X +
X -
Y +
Y -
Z +
Z -
GYRO RESET
IMU GYRO DRIVE
800 CPS SET
800 CPS RESET
3.2 KC SET
3.2 KC RESET
25.6 KC SET
25.6 KC RESET
CONVERTER SYNC (12.8 KC)
DISCRETE SIG CARRIER (102.4 KC)
POWER SUPPLY
AGC POWER FAIL
NAV PANEL LIGHT
OUT 0 1
OUT 0 2
OUT 0 3
OUT 0 4
OUT 0 5
OUT 0 6
OUT 0 7
OUT 0 8
OUT 0 9
OUT 0 10
OUT 0 11
OUT 0 12
OUT 0 13
OUT 0 14
OUT 0 15
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
TIMING (1.5 CPS)
SPARE
POWER SYNC N
SPARE
SPARE
SPARE
SPARE
KEY CODE 5
ERROR RESET
RELAY 'OR' C1→C22
KEY RESET
TEST ALARM
KEY CODE 1
KEY CODE 2
KEY CODE 3
KEY CODE 4
G AND N SYSTEM DISPLAY AND KEYBOARD PNL
P
S
R

NOTES:

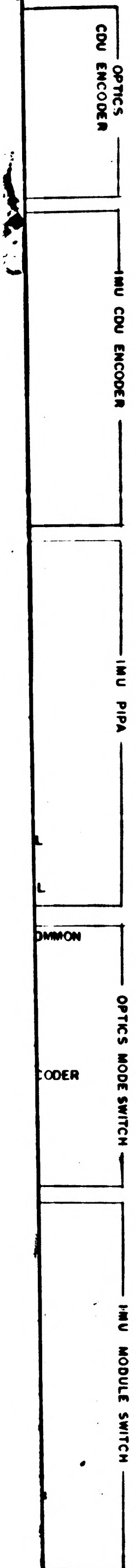
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

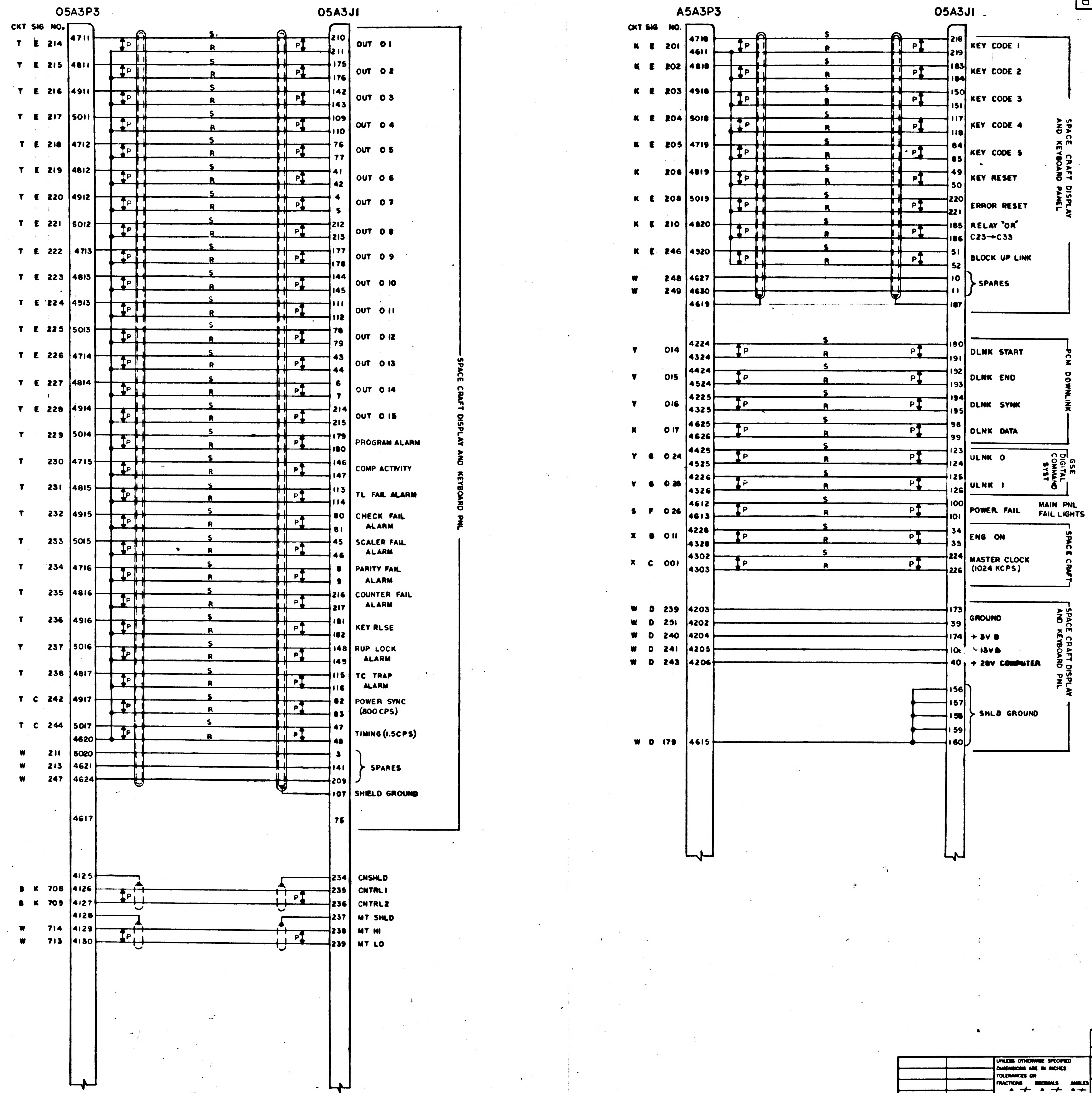
INCHES
PHOTOGRAPHIC SCALE ONLY

B 1819001

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 06500		WK
B	REVISED PER TDRR 07?? DR CHK R.F.E. RB	4/27/64	

REVISIONS 06100


OPTICS CDU ENCODER
IMU CDU ENCODER
IMU PIPA
OMMON
OPTICS MODE SWITCH
CODER
IMU MODULE SWITCH


05A3P3
05A3J1
CKT SIG NO.
T E 214 4711 210 211 OUT 01
T E 215 4811 175 176 OUT 02
T E 216 4911 142 143 OUT 03
T E 217 5011 109 110 OUT 04
T E 218 4712 76 77 OUT 05
T E 219 4812 41 42 OUT 06
T E 220 4912 4 5 OUT 07
T E 221 5012 212 213 OUT 08
T E 222 4713 177 178 OUT 09
T E 223 4813 144 145 OUT 010
T E 224 4913 111 112 OUT 011
T E 225 5013 78 79 OUT 012
T E 226 4714 43 44 OUT 013
T E 227 4814 6 7 OUT 014
T E 228 4914 214 215 OUT 015
T 229 5014 179 180 PROGRAM ALARM
T 230 4715 146 147 COMP ACTIVITY
T 231 4815 113 114 TL FAIL ALARM
T 232 4915 80 81 CHECK FAIL ALARM
T 233 5015 45 46 SCALER FAIL ALARM
T 234 4716 8 9 PARITY FAIL ALARM
T 235 4816 216 217 COUNTER FAIL ALARM
T 236 4916 181 182 KEY RLSE
T 237 5016 148 149 RUP LOCK ALARM
T 238 4817 115 116 TC TRAP ALARM
T C 242 4917 82 83 POWER SYNC (800 CPS)
T C 244 5017 4620 47 48 TIMING (1.5CPS)
W 211 5020 3
W 213 4621 141
W 247 4624 209
SPARES
107 SHIELD GROUND
4617 75
SPACE CRAFT DISPLAY AND KEYBOARD PNL
4125 234 CNSHLD
B K 708 4126 235 CNTRL1
B K 709 4127 236 CNTRL2
4128 237 MT SHLD
W 714 4129 238 MT HI
W 713 4130 239 MT LO
S
R
P
A5A3P3
05A3J1
CKT SIG NO.
K E 201 4718 4611 218 219 KEY CODE 1
K E 202 4818 183 184 KEY CODE 2
K E 203 4918 150 151 KEY CODE 3
K E 204 5018 117 118 KEY CODE 4
K E 205 4719 84 85 KEY CODE 5
K 206 4819 49 50 KEY RESET
K E 208 5019 220 221 ERROR RESET
K E 210 4820 185 186 RELAY "OR" C23→C33
K E 246 4920 51 52 BLOCK UP LINK
W 248 4627 10
W 249 4630 11
SPARES
4619 187
SPACE CRAFT DISPLAY AND KEYBOARD PANEL
Y 014 4224 4324 190 191 DLNK START
Y 015 4424 4524 192 193 DLNK END
Y 016 4225 4325 194 195 DLNK SYNK
X 017 4625 4626 98 99 DLNK DATA
PCM DOWNLINK
Y 6 024 4425 4525 123 124 ULNK 0
Y 6 025 4226 4326 125 126 ULNK 1
GSE DIGITAL COMMAND SYST
S F 026 4612 4613 100 101 POWER FAIL
MAIN PNL FAIL LIGHTS
X B 011 4228 4328 34 35 ENG ON
X C 001 4302 4303 224 226 MASTER CLOCK (1024 KCPS)
SPACE CRAFT
W D 239 4203 173 GROUND
W D 251 4202 39
W D 240 4204 174 + 3V B
W D 241 4205 10 - 13V B
W D 243 4206 40 + 28V COMPUTER
156 157 158 159 160 SHLD GROUND
W D 179 4615
SPACE CRAFT DISPLAY AND KEYBOARD PNL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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FINAL FINISH —

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CAMBRIDGE MASS
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CHECKED D. J. B...
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

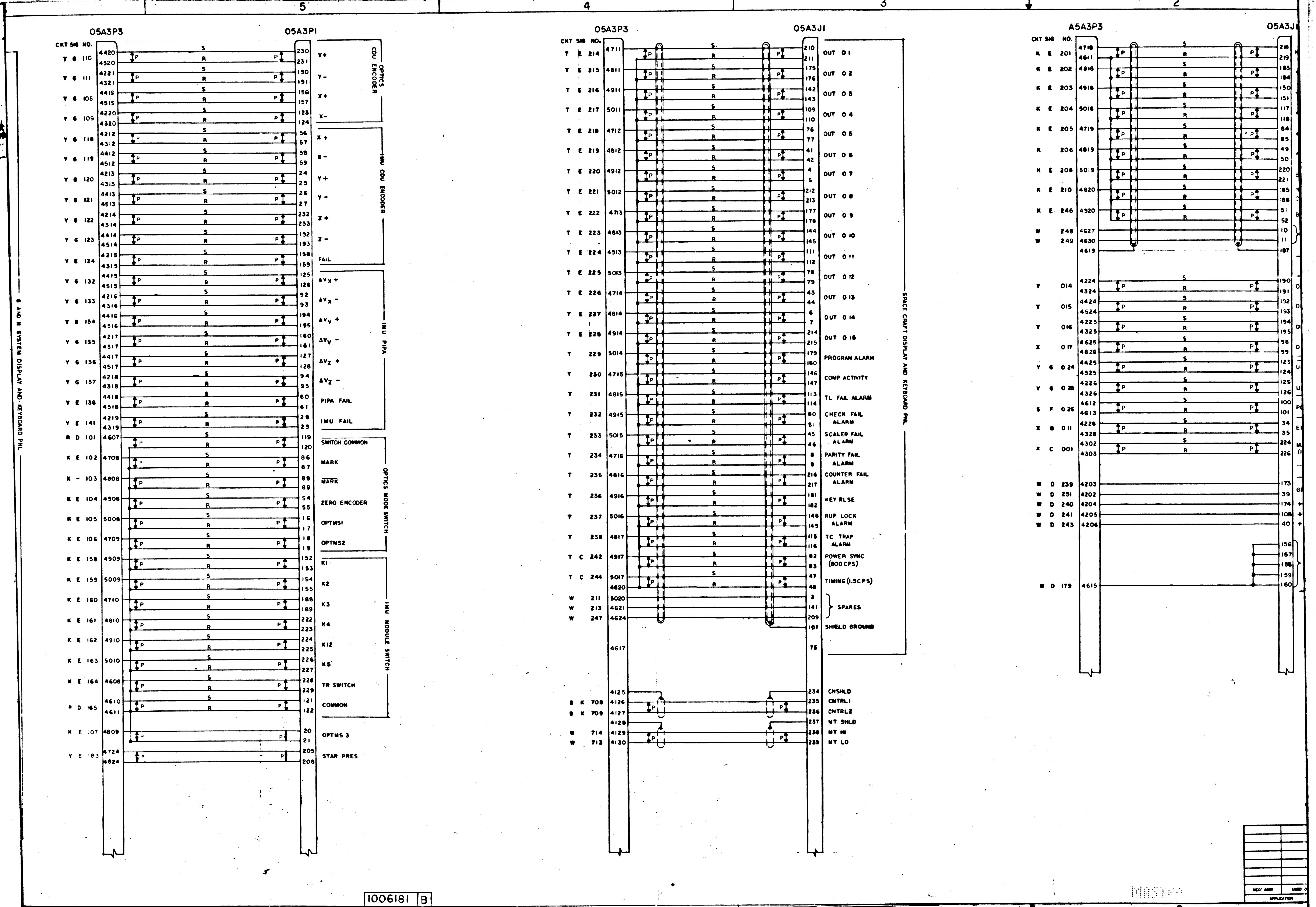
WIRING DIAGRAM
TRAY C

CODE IDENT NO. — SIZE J NASA DRAWING NO. 1006181
SCALE — WT — SHEET 1 OF 2

1006181 B

MASTER

E3/43



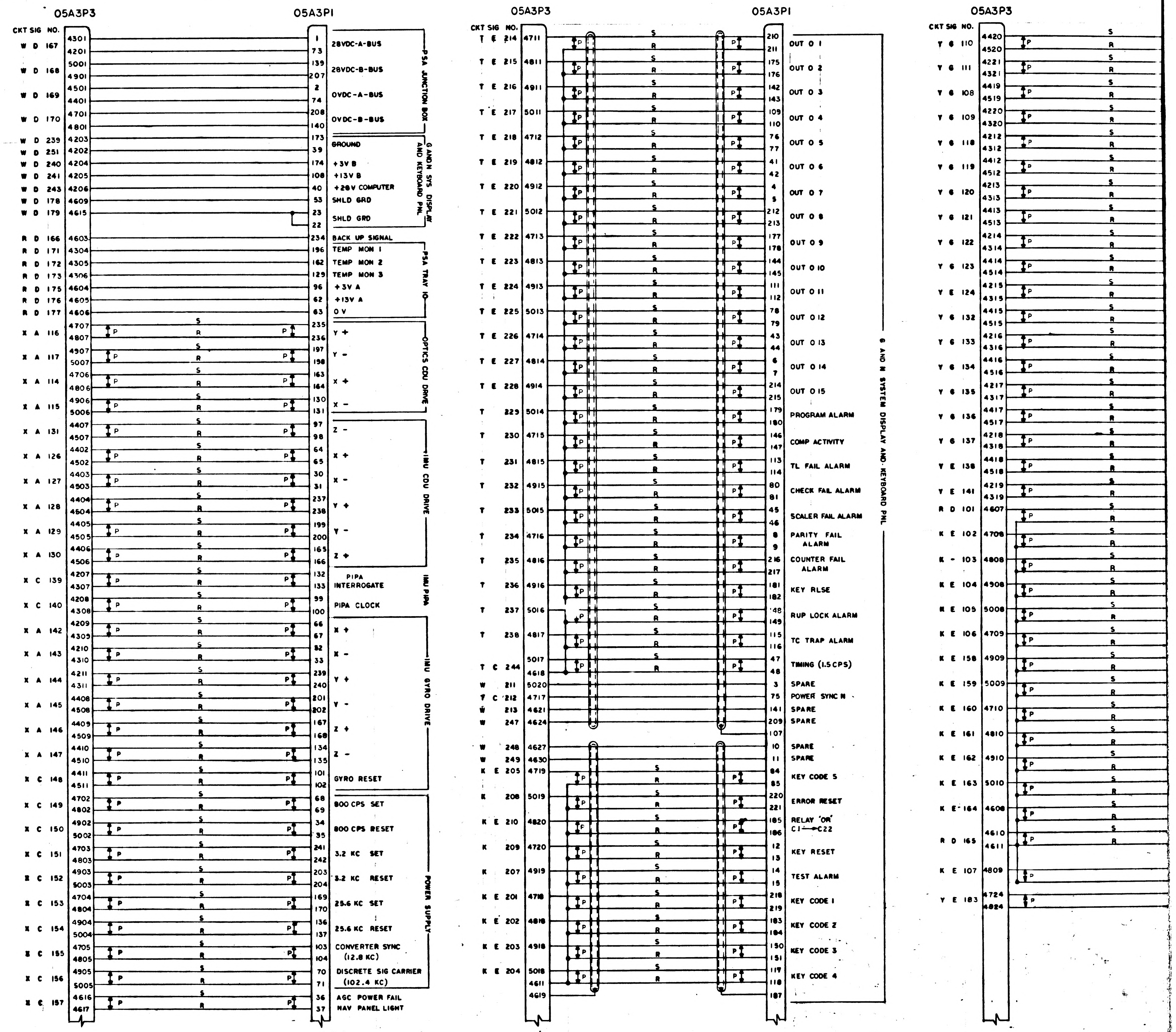
5
4
3
2
05A3P3
05A3P1
CKT SIG NO.
OPTICS CDU ENCODER
Y+
Y-
X+
X-
IMU CDU ENCODER
Z+
Z-
FAIL
IMU PIPA
ΔVX +
ΔVX -
ΔVY +
ΔVY -
ΔVZ +
ΔVZ -
PIPA FAIL
IMU FAIL
OPTICS MODE SWITCH
SWITCH COMMON
MARK
MARK
ZERO ENCODER
OPTMS1
OPTMS2
IMU MODULE SWITCH
K1
K2
K3
K4
K12
K5
TR SWITCH
COMMON
OPTMS 3
STAR PRES
G AND N SYSTEM DISPLAY AND KEYBOARD PNL
05A3P3
05A3J1
OUT 01
OUT 02
OUT 03
OUT 04
OUT 05
OUT 06
OUT 07
OUT 08
OUT 09
OUT 010
OUT 011
OUT 012
OUT 013
OUT 014
OUT 015
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
POWER SYNC (800 CPS)
TIMING (1.5CPS)
SPARES
SHIELD GROUND
SPACE CRAFT DISPLAY AND KEYBOARD PNL
CNSHLD
CNTRL1
CNTRL2
MT SHLD
MT HI
MT LO
A5A3P3
05A3J
SPACE CRAFT DISPLAY AND KEYBOARD PNL
DIGITAL COMMAND
SPACE CRAFT
MASTER

1006181 B

1006181 B 2/3

SHEET 1

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DRAWINGS FOR REFERENCE: 1014523 INTERCONNECTION DIAGRAM, APOLLO GUIDANCE EQUIPMENT, LOWER EQUIPMENT BAY 1010150 PSA FAMILY TREE
3. REFER TO DRAWINGS LISTED IN NOTE 2 FOR LISTING OF OTHER PSA JUNCTION BOX INTERCONNECTION WIRING DRAWINGS AND DEFINITION OF REFERENCE NUMBERS
4. NUMBERS IN CONDUCTORS GIVE DESTINATION OF THAT CONDUCTOR


05A3P3
CKT SIG NO.
W D 167 4301 4201
W D 168 5001 4901
W D 169 4501 4401
W D 170 4701 4801
W D 239 4203
W D 251 4202
W D 240 4204
W D 241 4205
W D 243 4206
W D 178 4609
W D 179 4615
R D 166 4603
R D 171 4304
R D 172 4305
R D 173 4306
R D 175 4604
R D 176 4605
R D 177 4606
X A 116 4707 4807
X A 117 4907 5007
X A 114 4706 4806
X A 115 4906 5006
X A 131 4407 4507
X A 126 4402 4502
X A 127 4403 4503
X A 128 4404 4504
X A 129 4405 4505
X A 130 4406 4506
X C 139 4207 4307
X C 140 4208 4308
X A 142 4209 4309
X A 143 4210 4310
X A 144 4211 4311
X A 145 4408 4508
X A 146 4409 4509
X A 147 4410 4510
X C 148 4411 4511
X C 149 4702 4802
X C 150 4902 5002
X C 151 4703 4803
X C 152 4903 5003
X C 153 4704 4804
X C 154 4904 5004
X C 155 4705 4805
X C 156 4905 5005
X C 157 4616 4617
P
S
R
05A3P1
1 73 28VDC-A-BUS
139 207 28VDC-B-BUS
2 74 OVDC-A-BUS
208 140 OVDC-B-BUS
PSA JUNCTION BOX
173 39 GROUND
174 +3V B
108 +13V B
40 +28V COMPUTER
53 SHLD GRD
23 22 SHLD GRD
G AND N SYS DISPLAY AND KEYBOARD PNL
234 BACK UP SIGNAL
196 TEMP MON 1
162 TEMP MON 2
129 TEMP MON 3
96 +3V A
62 +13V A
63 0 V
PSA TRAY 10
235 236 Y +
197 198 Y -
163 164 X +
130 131 X -
OPTICS CDU DRIVE
97 98 Z -
64 65 X +
30 31 X -
237 238 Y +
199 200 Y -
165 166 Z +
IMU CDU DRIVE
132 133 PIPA INTERROGATE
99 100 PIPA CLOCK
IMU PIPA
66 67 X +
32 33 X -
239 240 Y +
201 202 Y -
167 168 Z +
134 135 Z -
101 102 GYRO RESET
IMU GYRO DRIVE
68 69 800 CPS SET
34 35 800 CPS RESET
241 242 3.2 KC SET
203 204 3.2 KC RESET
169 170 25.6 KC SET
136 137 25.6 KC RESET
103 104 CONVERTER SYNC (12.8 KC)
70 71 DISCRETE SIG CARRIER (102.4 KC)
POWER SUPPLY
36 AGC POWER FAIL
37 NAV PANEL LIGHT
05A3P3
CKT SIG NO.
T E 214 4711
T E 215 4811
T E 216 4911
T E 217 5011
T E 218 4712
T E 219 4812
T E 220 4912
T E 221 5012
T E 222 4713
T E 223 4813
T E 224 4913
T E 225 5013
T E 226 4714
T E 227 4814
T E 228 4914
T 229 5014
T 230 4715
T 231 4815
T 232 4915
T 233 5015
T 234 4716
T 235 4816
T 236 4916
T 237 5016
T 238 4817
5017
T C 244 4618
W 211 5020
T C 212 4717
W 213 4621
W 247 4624
W 248 4627
W 249 4630
K E 205 4719
K 208 5019
K E 210 4820
K 209 4720
K 207 4919
K E 201 4718
K E 202 4818
K E 203 4918
K E 204 5018
4611
4619
05A3P1
210 211 OUT 0 1
175 176 OUT 0 2
142 143 OUT 0 3
109 110 OUT 0 4
76 77 OUT 0 5
41 42 OUT 0 6
4 5 OUT 0 7
212 213 OUT 0 8
177 178 OUT 0 9
144 145 OUT 0 10
111 112 OUT 0 11
78 79 OUT 0 12
43 44 OUT 0 13
6 7 OUT 0 14
214 215 OUT 0 15
179 180 PROGRAM ALARM
146 147 COMP ACTIVITY
113 114 TL FAIL ALARM
80 81 CHECK FAIL ALARM
45 46 SCALER FAIL ALARM
8 9 PARITY FAIL ALARM
216 217 COUNTER FAIL ALARM
181 182 KEY RLSE
148 149 RUP LOCK ALARM
115 116 TC TRAP ALARM
47 48 TIMING (1.5 CPS)
3 SPARE
75 POWER SYNC N
141 SPARE
209 SPARE
107
10 SPARE
11 SPARE
84 85 KEY CODE 5
220 221 ERROR RESET
185 186 RELAY 'OR' C1 → C22
12 13 KEY RESET
14 15 TEST ALARM
218 219 KEY CODE 1
183 184 KEY CODE 2
150 151 KEY CODE 3
117 118 KEY CODE 4
187
G AND N SYSTEM DISPLAY AND KEYBOARD PNL
05A3P3
CKT SIG NO.
Y G 110 4420 4520
Y G 111 4221 4321
Y G 108 4419 4519
Y G 109 4220 4320
Y G 118 4212 4312
Y G 119 4412 4512
Y G 120 4213 4313
Y G 121 4413 4513
Y G 122 4214 4314
Y G 123 4414 4514
Y E 124 4215 4315
Y G 132 4415 4515
Y G 133 4216 4316
Y G 134 4416 4516
Y G 135 4217 4317
Y G 136 4417 4517
Y G 137 4218 4318
Y E 138 4418 4518
Y E 141 4219 4319
R D 101 4607
K E 102 4708
K - 103 4808
K E 104 4908
K E 105 5008
K E 106 4709
K E 158 4909
K E 159 5009
K E 160 4710
K E 161 4810
K E 162 4910
K E 163 5010
K E-164 4608
R D 165 4610 4611
K E 107 4809
Y E 183 4724 4824

SHEET 1

1006181 B

SYM	REVISIONS DESCRIPTION	DATE	APPROVAL
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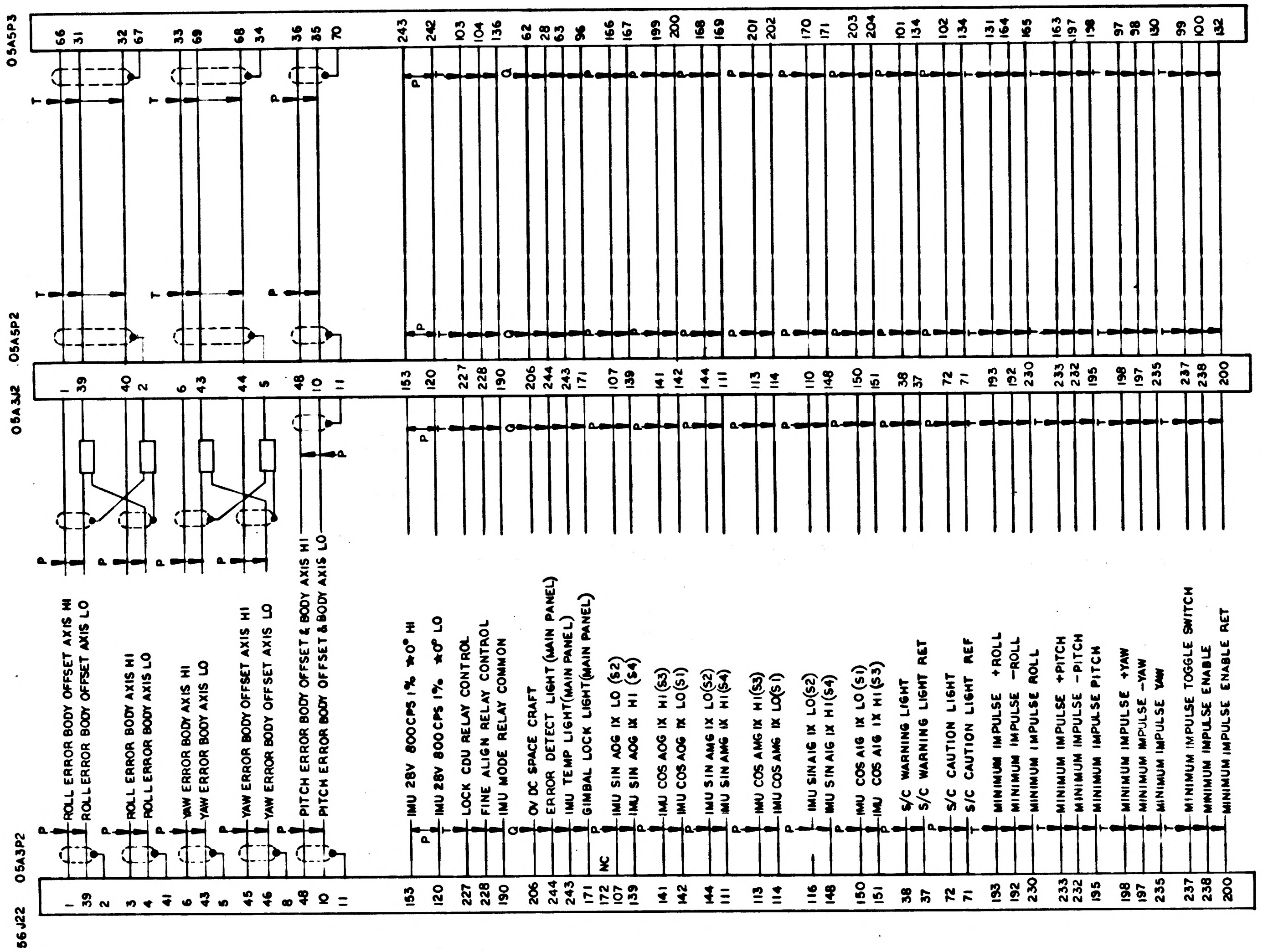


05A5P3
05A5P2
05A3J2
05A3P2
56J22
ROLL ERROR BODY OFFSET AXIS HI
ROLL ERROR BODY OFFSET AXIS LO
ROLL ERROR BODY AXIS HI
ROLL ERROR BODY AXIS LO
YAW ERROR BODY AXIS HI
YAW ERROR BODY AXIS LO
YAW ERROR BODY OFFSET AXIS HI
YAW ERROR BODY OFFSET AXIS LO
PITCH ERROR BODY OFFSET & BODY AXIS HI
PITCH ERROR BODY OFFSET & BODY AXIS LO
IMU 28V 800CPS 1% ★0° HI
IMU 28V 800CPS 1% ★0° LO
LOCK CDU RELAY CONTROL
FINE ALIGN RELAY CONTROL
IMU MODE RELAY COMMON
0V DC SPACE CRAFT
ERROR DETECT LIGHT (MAIN PANEL)
IMU TEMP LIGHT (MAIN PANEL)
GIMBAL LOCK LIGHT (MAIN PANEL)
NC
IMU SIN AOG IX LO (S2)
IMU SIN AOG IX HI (S4)
IMU COS AOG IX HI (S3)
IMU COS AOG IX LO (S1)
IMU SIN AMG IX LO (S2)
IMU SIN AMG IX HI (S4)
IMU COS AMG IX HI (S3)
IMU COS AMG IX LO (S1)
IMU SIN AIG IX LO (S2)
IMU SIN AIG IX HI (S4)
IMU COS AIG IX LO (S1)
IMU COS AIG IX HI (S3)
S/C WARNING LIGHT
S/C WARNING LIGHT RET
S/C CAUTION LIGHT
S/C CAUTION LIGHT REF
MINIMUM IMPULSE +ROLL
MINIMUM IMPULSE -ROLL
MINIMUM IMPULSE ROLL
MINIMUM IMPULSE +PITCH
MINIMUM IMPULSE -PITCH
MINIMUM IMPULSE PITCH
MINIMUM IMPULSE +YAW
MINIMUM IMPULSE -YAW
MINIMUM IMPULSE YAW
MINIMUM IMPULSE TOGGLE SWITCH
MINIMUM IMPULSE ENABLE
MINIMUM IMPULSE ENABLE RET
P
T
Q

Ⓑ THIS SHEET ADDED PER TDRR 07496

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

NEXT ASSY | USED ON
APPLICATION

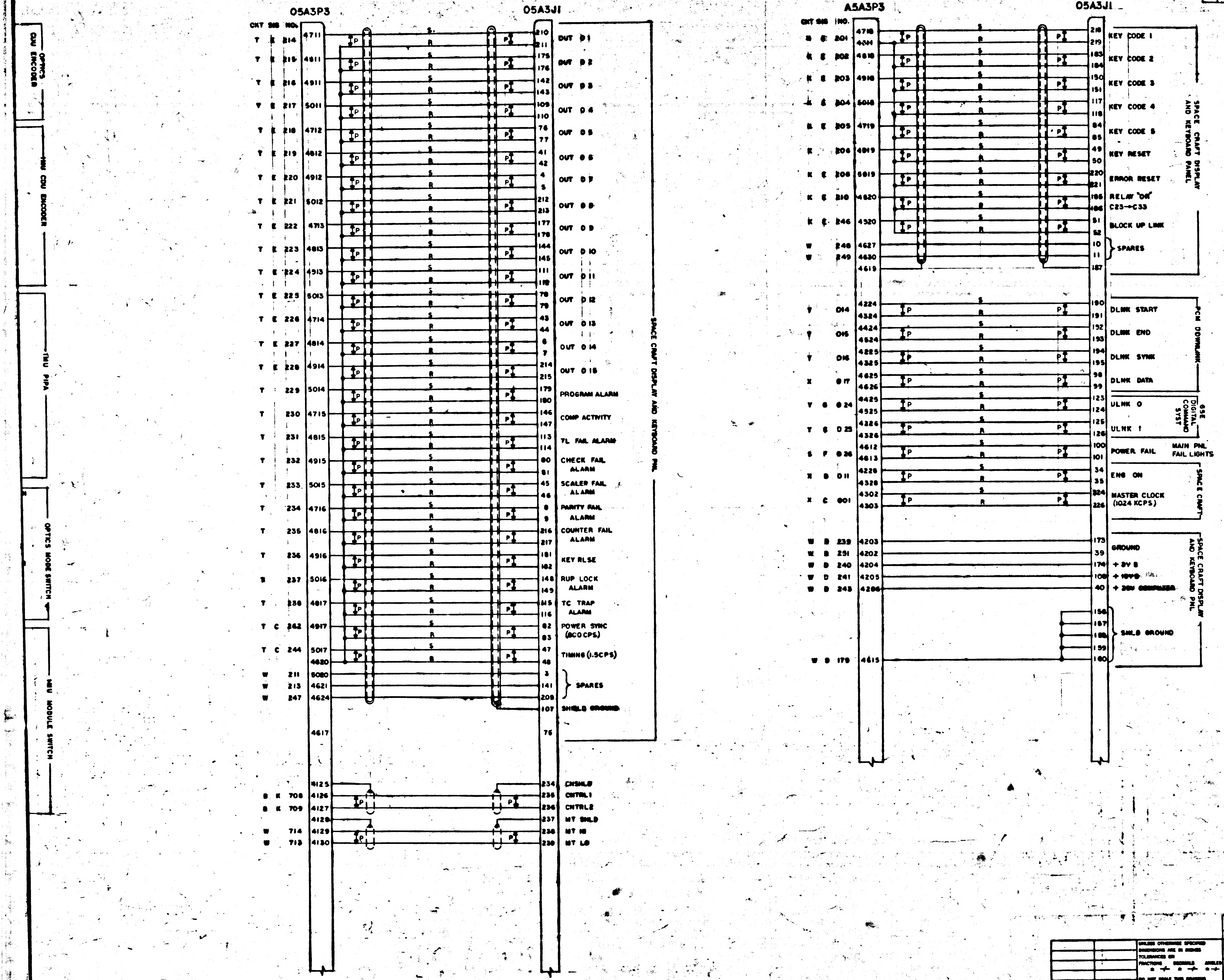
MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN R.W.D. DATE 4-1-64
CHECKED R. Edwards
APPROVAL
APPROVAL Eldon C. Hall
NASA APPROVAL W. J. 5-12-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRING DIAGRAM
TRAY C

CODE IDENT NO. —
SIZE J
NASA DRAWING NO. 1006181
SCALE —
WT
SHEET 2 OF 2

1006181 B


OPTICS CDU ENCODER
IMU CDU ENCODER
IMU PIPA
OPTICS MODE SWITCH
IMU MODULE SWITCH
05A3P3
05A3J1
CKT SIG NO.
T E 214 4711 210 211 OUT D1
T E 215 4811 175 176 OUT D2
T E 216 4911 142 143 OUT D3
T E 217 5011 109 110 OUT D4
T E 218 4712 76 77 OUT D5
T E 219 4812 41 42 OUT D6
T E 220 4912 4 5 OUT D7
T E 221 5012 212 213 OUT D8
T E 222 4713 177 178 OUT D9
T E 223 4813 144 145 OUT D10
T E 224 4913 111 112 OUT D11
T E 225 5013 78 79 OUT D12
T E 226 4714 43 44 OUT D13
T E 227 4814 6 7 OUT D14
T E 228 4914 214 215 OUT D15
T 229 5014 179 180 PROGRAM ALARM
T 230 4715 146 147 COMP ACTIVITY
T 231 4815 113 114 TL FAIL ALARM
T 232 4915 80 81 CHECK FAIL ALARM
T 233 5015 45 46 SCALER FAIL ALARM
T 234 4716 8 9 PARITY FAIL ALARM
T 235 4816 216 217 COUNTER FAIL ALARM
T 236 4916 181 182 KEY RLSE
T 237 5016 148 149 RUP LOCK ALARM
T 238 4817 115 116 TC TRAP ALARM
T C 242 4917 82 83 POWER SYNC (800CPS)
T C 244 5017 4620 47 48 TIMING (1.5CPS)
W 211 5080 3
W 213 4621 141
W 247 4624 209
SPARES
107 SHIELD GROUND
4617 75
SPACE CRAFT DISPLAY AND KEYBOARD PNL
4125 234 CNSHLD
B K 708 4126 235 CNTRL1
B K 709 4127 236 CNTRL2
4128 237 MT SHLD
W 714 4129 238 MT HI
W 713 4130 239 MT LO
S R P
A5A3P3
05A3J1
CKT SIG NO.
K E 201 4718 4311 218 219 KEY CODE 1
K E 202 4818 183 184 KEY CODE 2
K E 203 4918 150 151 KEY CODE 3
K E 204 5018 117 118 KEY CODE 4
K E 205 4719 84 85 KEY CODE 5
K 206 4819 49 50 KEY RESET
K E 208 5019 220 221 ERROR RESET
K E 210 4820 185 186 RELAY "OR" C23→C33
K E 246 4920 51 52 BLOCK UP LINK
W 248 4627 10
W 249 4630 11
SPARES
4619 187
SPACE CRAFT DISPLAY AND KEYBOARD PANEL
Y D14 4224 4324 190 191 DLNK START
Y D15 4424 4524 192 193 DLNK END
Y D16 4225 4325 194 195 DLNK SYNK
X D17 4625 4626 98 99 DLNK DATA
PCM DOWNLINK
Y G D24 4425 4525 123 124 ULNK 0
Y G D25 4226 4326 125 126 ULNK 1
G&E DIGITAL COMMAND SYST
S F D26 4612 4613 100 101 POWER FAIL
MAIN PNL FAIL LIGHTS
X B D11 4228 4328 34 35 ENG ON
X C D01 4302 4303 224 226 MASTER CLOCK (1024 KCPS)
SPACE CRAFT
W B 239 4203 173 GROUND
W B 251 4202 39
W D 240 4204 174 + 3V B
W D 241 4205 108 + 10VB
W D 243 4206 40 + 28V COMPUTER
156 157 158 159 160 SHLD GROUND
W B 179 4615
SPACE CRAFT DISPLAY AND KEYBOARD PNL

1006181 C

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 06500		GK
B	REVISED PER TDRR 07916 DR R.D. CHK R.H.E. RQ	4/27/64	Hac
C	REVISED PER TDRR 10128 DR R.W.Q. CHK R.H.E.	4 Jun 64	Hac

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY | USED ON
APPLICATION

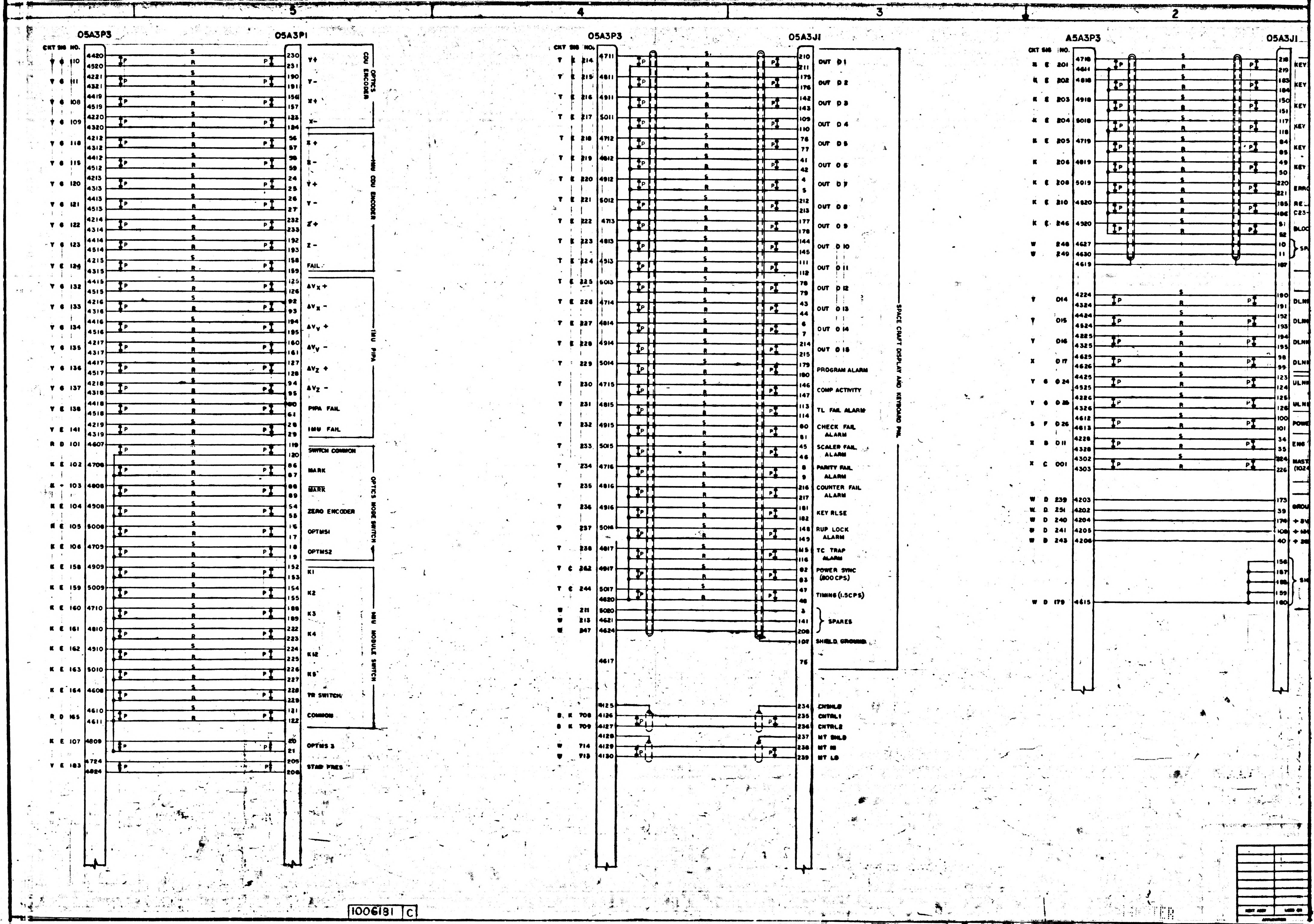
MIT INSTRUMENTATION LAB
Cambridge, Mass.
DRAWN
CHECKED D.J. R
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRING DIAGRAM
TRAY C

CODE IDENT NO. —
SIZE J
NASA DRAWING NO. 1006181
SCALE —
SHEET 1 OF

1006181 C

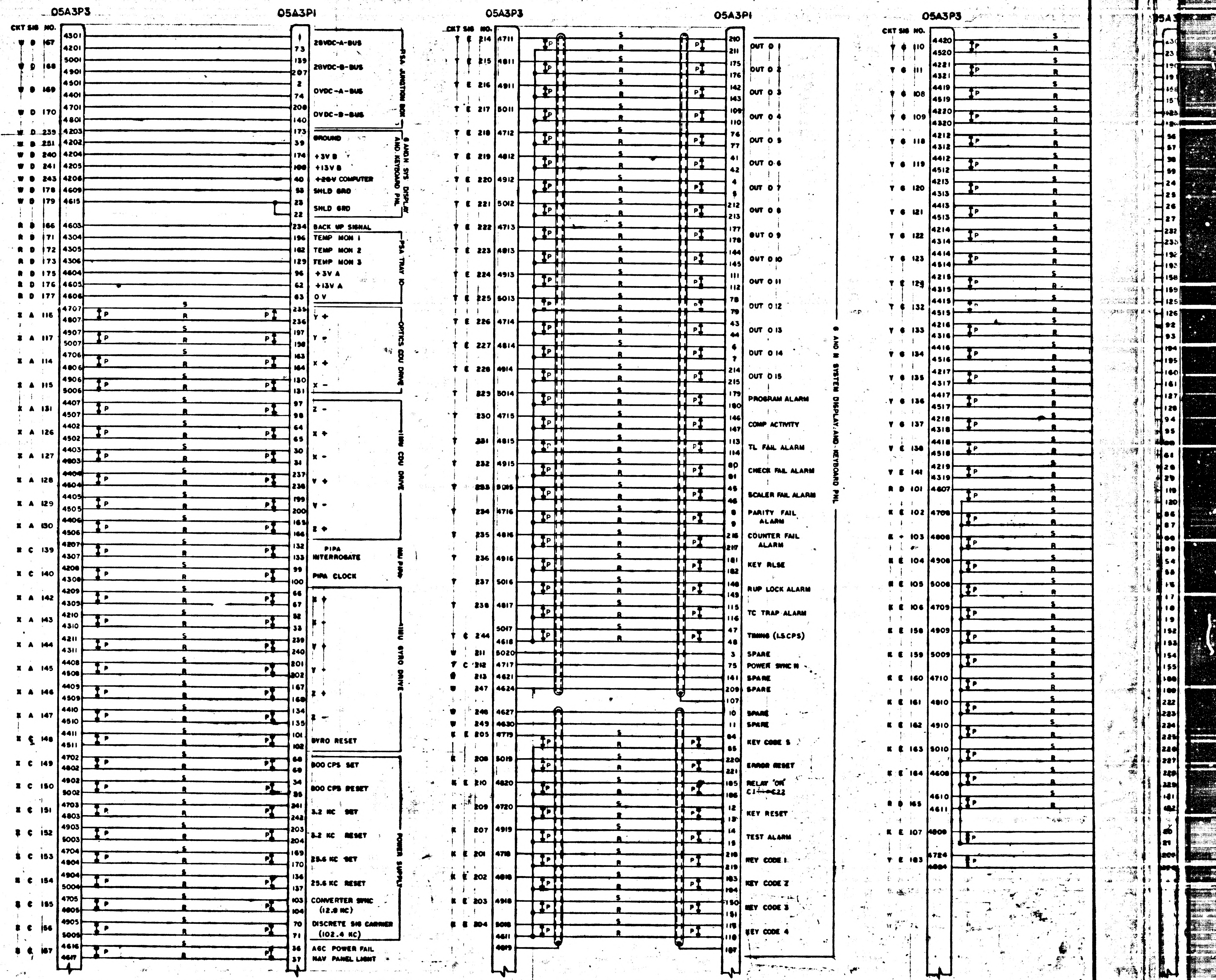

5
4
3
2
05A3P3
05A3P1
05A3P3
05A3J1
A5A3P3
05A3J1
CKT SIG NO.
S
R
P
OPTICS CDU ENCODER
IMU CDU ENCODER
IMU PIPA
OPTICS MODE SWITCH
IMU MODULE SWITCH
Y+
Y-
X+
X-
Z+
Z-
FAIL
ΔVX +
ΔVX -
ΔVY +
ΔVY -
ΔVZ +
ΔVZ -
PIPA FAIL
IMU FAIL
SWITCH COMMON
MARK
MARK
ZERO ENCODER
OPTMS1
OPTMS2
K1
K2
K3
K4
K12
K5
TR SWITCH
COMMON
OPTMS 3
STAB PRES
SPACE CRAFT DISPLAY AND KEYBOARD PNL
OUT D1
OUT D2
OUT D3
OUT D4
OUT D5
OUT D6
OUT D7
OUT D8
OUT D9
OUT D10
OUT D11
OUT D12
OUT D13
OUT D14
OUT D15
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
POWER SYNC (800 CPS)
TIMING (1.5CPS)
SPARES
SHIELD GROUND
CNSHLD
CNTRL1
CNTRL2
MT SHLD
MT HI
MT LO
KEY
ERRO
RE
C23
BLOC
SP
DLNK
ULNK
POWE
ENG
MAST (1024
GROU
+8V
+16
+28
SH
SPACE CRAFT DISPLAY
PCM DOWNLINK
PNL LIGHTS
SPACE CRAFT DISPLAY

1006181 C

1006181 C

SHEET 1

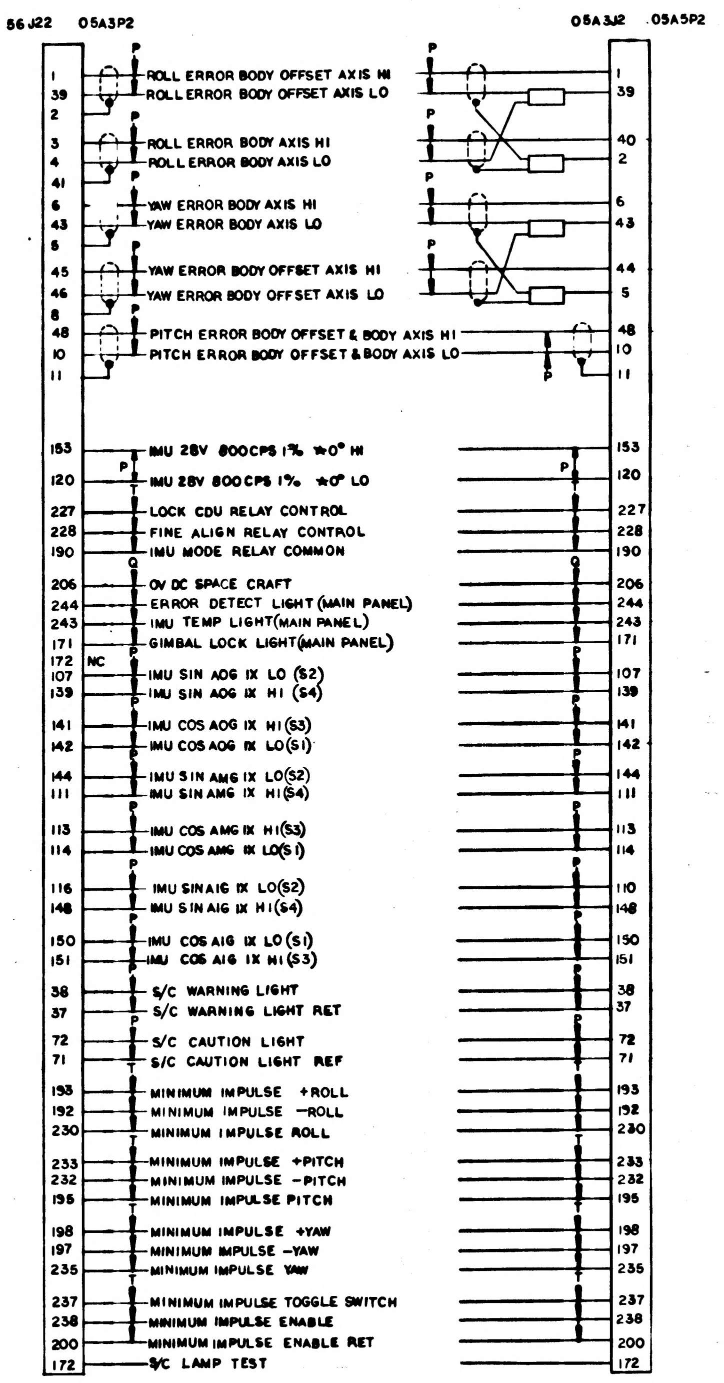
NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DRAWINGS FOR REFERENCE: 1014523 INTERCONNECTION DIAGRAM, APOLLO GUIDANCE EQUIPMENT, LOWER EQUIPMENT BAY 1010150 PSA FAMILY TREE
3. REFER TO DRAWINGS LISTED IN NOTE 2 FOR LISTING OF OTHER PSA JUNCTION BOX INTERCONNECTION WIRING DRAWINGS AND DEFINITION OF REFERENCE NUMBERS
4. NUMBERS IN CONDUCTORS GIVE DESTINATION OF THAT CONDUCTOR


05A3P3
05A3P1
05A3P3
05A3P1
05A3P3
CKT SIG NO.
28VDC-A-BUS
28VDC-B-BUS
0VDC-A-BUS
0VDC-B-BUS
PSA JUNCTION BOX
GROUND
+3V B
+13V B
+28V COMPUTER
SHLD GRD
SHLD GRD
G AND N SYS DISPLAY AND KEYBOARD PNL
BACK UP SIGNAL
TEMP MON 1
TEMP MON 2
TEMP MON 3
+3V A
+13V A
0 V
PSA TRAY 10
Y +
Y -
X +
X -
OPTICS CDU DRIVE
Z -
X +
X -
Y +
Y -
Z +
IMU CDU DRIVE
PIPA INTERROGATE
PIPA CLOCK
IMU PIPA
X +
X -
Y +
Y -
Z +
Z -
GYRO RESET
IMU GYRO DRIVE
800 CPS SET
800 CPS RESET
3.2 KC SET
3.2 KC RESET
25.6 KC SET
25.6 KC RESET
CONVERTER SYNC (12.8 KC)
DISCRETE SIG CARRIER (102.4 KC)
POWER SUPPLY
AGC POWER FAIL
NAV PANEL LIGHT
OUT 0 1
OUT 0 2
OUT 0 3
OUT 0 4
OUT 0 5
OUT 0 6
OUT 0 7
OUT 0 8
OUT 0 9
OUT 0 10
OUT 0 11
OUT 0 12
OUT 0 13
OUT 0 14
OUT 0 15
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
TIMING (1.5CPS)
SPARE
POWER SYNC N
SPARE
SPARE
SPARE
SPARE
KEY CODE 5
ERROR RESET
RELAY 'OR' C1—C22
KEY RESET
TEST ALARM
KEY CODE 1
KEY CODE 2
KEY CODE 3
KEY CODE 4
G AND N SYSTEM DISPLAY AND KEYBOARD PNL
P
S
R

SHEET 1

1006181 C

SYM	DESCRIPTION	DATE	APPROVAL
B	THIS SHEET ADDED PER TDRR 07496		
C	REVISED PER TDRR 10128 DR		



56J22
05A3P2
05A3J2
05A5P2
1 ROLL ERROR BODY OFFSET AXIS HI
39 ROLL ERROR BODY OFFSET AXIS LO
2
3 ROLL ERROR BODY AXIS HI
4 ROLL ERROR BODY AXIS LO
41
6 YAW ERROR BODY AXIS HI
43 YAW ERROR BODY AXIS LO
5
45 YAW ERROR BODY OFFSET AXIS HI
46 YAW ERROR BODY OFFSET AXIS LO
8
48 PITCH ERROR BODY OFFSET & BODY AXIS HI
10 PITCH ERROR BODY OFFSET & BODY AXIS LO
11
153 IMU 28V 800CPS 1% ★0° HI
120 IMU 28V 800CPS 1% ★0° LO
227 LOCK CDU RELAY CONTROL
228 FINE ALIGN RELAY CONTROL
190 IMU MODE RELAY COMMON
206 OV DC SPACE CRAFT
244 ERROR DETECT LIGHT (MAIN PANEL)
243 IMU TEMP LIGHT (MAIN PANEL)
171 GIMBAL LOCK LIGHT (MAIN PANEL)
172 NC
107 IMU SIN AOG IX LO (S2)
139 IMU SIN AOG IX HI (S4)
141 IMU COS AOG IX HI (S3)
142 IMU COS AOG IX LO (S1)
144 IMU SIN AMG IX LO (S2)
111 IMU SIN AMG IX HI (S4)
113 IMU COS AMG IX HI (S3)
114 IMU COS AMG IX LO (S1)
116 IMU SIN AIG IX LO (S2)
148 IMU SIN AIG IX HI (S4)
150 IMU COS AIG IX LO (S1)
151 IMU COS AIG IX HI (S3)
38 S/C WARNING LIGHT
37 S/C WARNING LIGHT RET
72 S/C CAUTION LIGHT
71 S/C CAUTION LIGHT REF
193 MINIMUM IMPULSE +ROLL
192 MINIMUM IMPULSE −ROLL
230 MINIMUM IMPULSE ROLL
233 MINIMUM IMPULSE +PITCH
232 MINIMUM IMPULSE −PITCH
195 MINIMUM IMPULSE PITCH
198 MINIMUM IMPULSE +YAW
197 MINIMUM IMPULSE −YAW
235 MINIMUM IMPULSE YAW
237 MINIMUM IMPULSE TOGGLE SWITCH
238 MINIMUM IMPULSE ENABLE
200 MINIMUM IMPULSE ENABLE RET
172 S/C LAMP TEST
1
39
40
2
6
43
44
5
48
10
11
153
120
227
228
190
206
244
243
171
107
139
141
142
144
111
113
114
110
148
150
151
38
37
72
71
193
192
230
233
232
195
198
197
235
237
238
200
172
P
Q
T

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MASTER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY | USED ON
APPLICATION

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

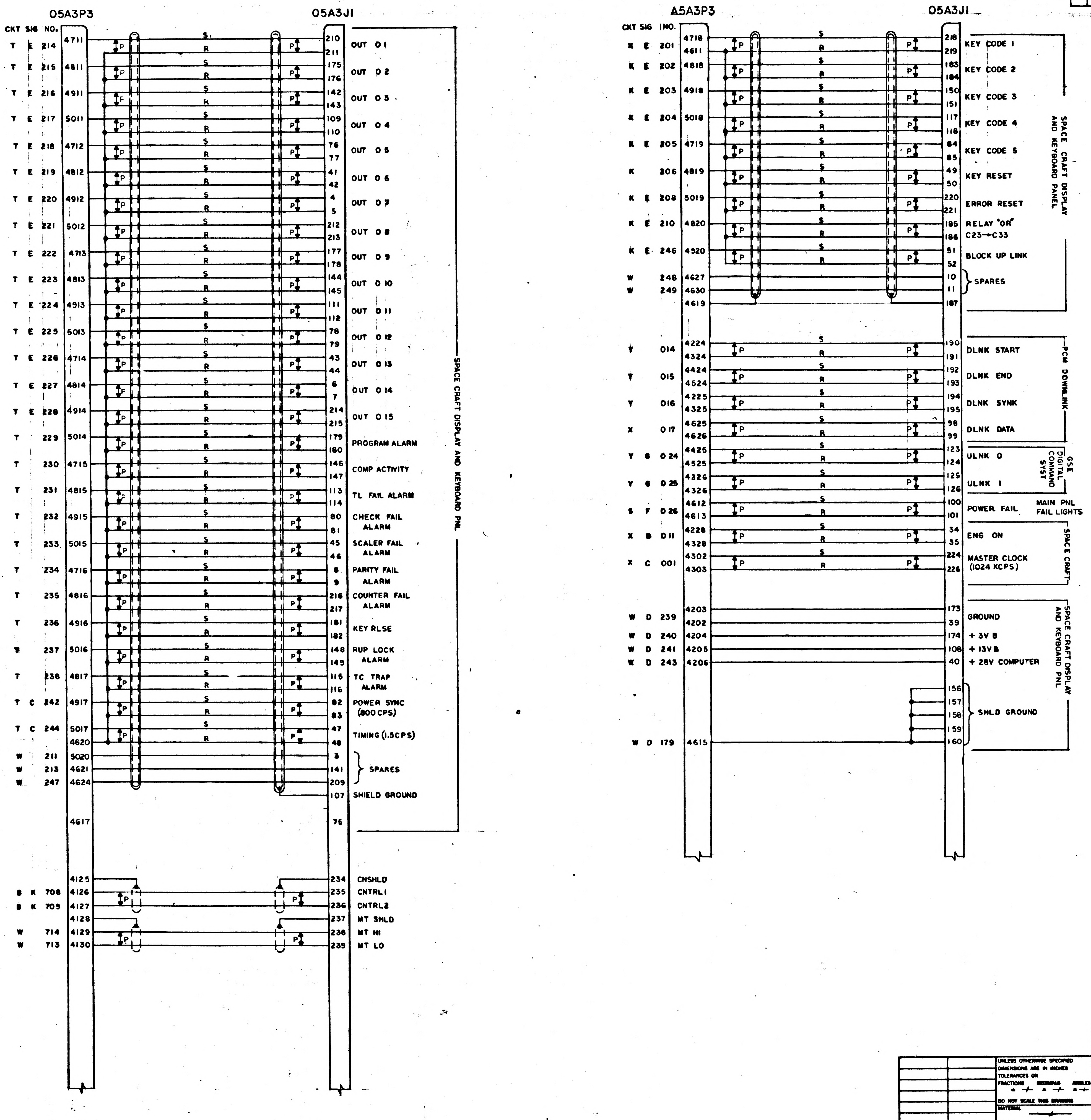
WIRING DIAGRAM
TRAY C

SIZE J

NASA DRAWING NO. 1006181

SHEET 2 OF 2

1006181 C


05A3P3
05A3J1
CKT SIG NO.
OUT 0 1
OUT 0 2
OUT 0 3
OUT 0 4
OUT 0 5
OUT 0 6
OUT 0 7
OUT 0 8
OUT 0 9
OUT 0 10
OUT 0 11
OUT 0 12
OUT 0 13
OUT 0 14
OUT 0 15
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
POWER SYNC (800 CPS)
TIMING (1.5 CPS)
SPARES
SHIELD GROUND
SPACE CRAFT DISPLAY AND KEYBOARD PNL
CNSHLD
CNTRL1
CNTRL2
MT SHLD
MT HI
MT LO
A5A3P3
05A3J1
KEY CODE 1
KEY CODE 2
KEY CODE 3
KEY CODE 4
KEY CODE 5
KEY RESET
ERROR RESET
RELAY "OR" C23→C33
BLOCK UP LINK
SPARES
SPACE CRAFT DISPLAY AND KEYBOARD PANEL
DLNK START
DLNK END
DLNK SYNK
DLNK DATA
PCM DOWNLINK
ULNK 0
ULNK 1
GSE DIGITAL COMMAND SYST
POWER FAIL
MAIN PNL FAIL LIGHTS
ENG ON
MASTER CLOCK (1024 KCPS)
SPACE CRAFT
GROUND
+ 3V B
+ 13V B
+ 28V COMPUTER
SHLD GROUND
SPACE CRAFT DISPLAY AND KEYBOARD PNL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN A. D. Lee DATE
CHECKED D. J. Bowler 30 JAN
APPROVAL
APPROVAL 3 Feb 64
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

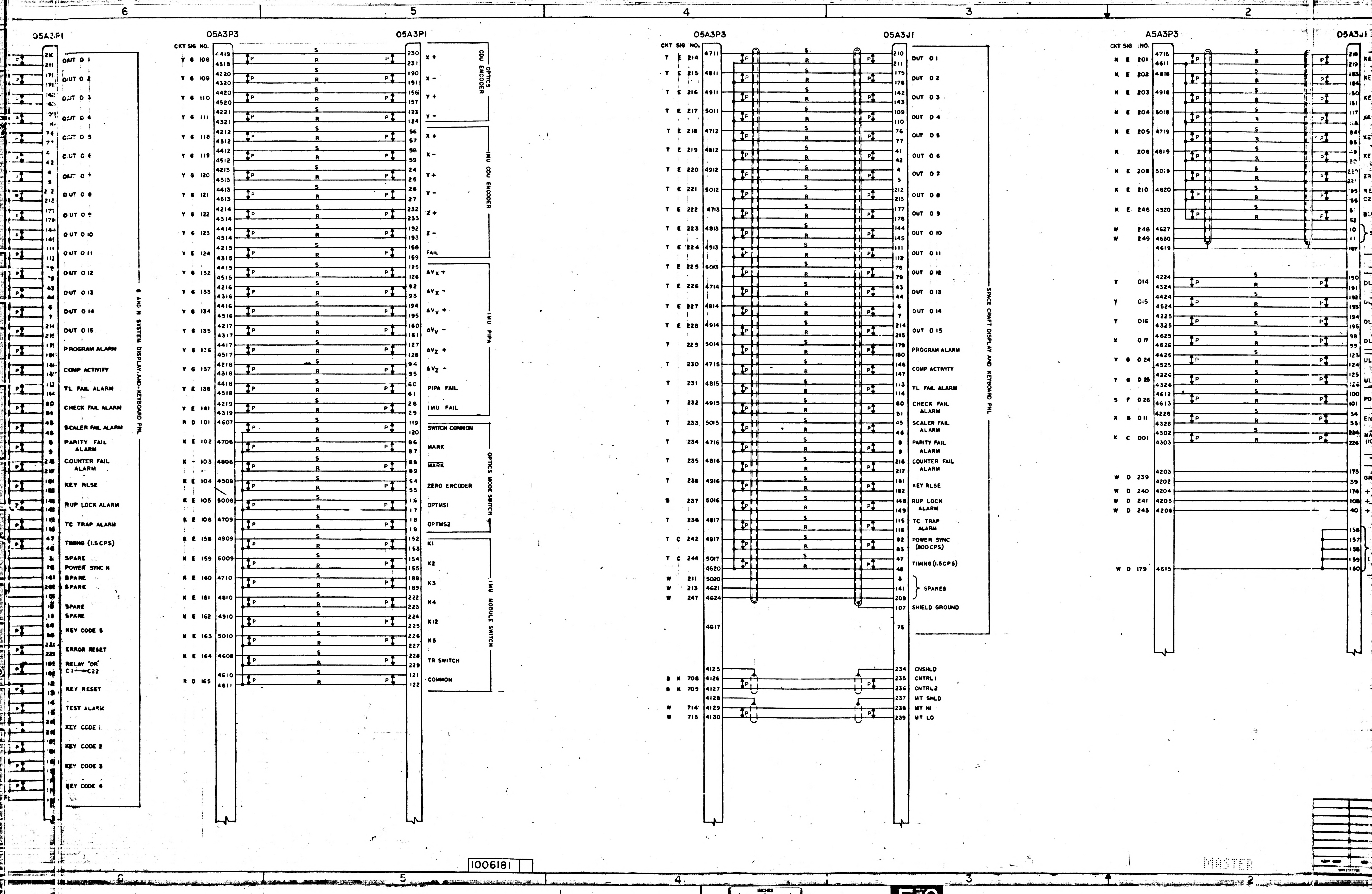
WIRING DIAGRAM
AGC TO SPACE CRAFT & PSA

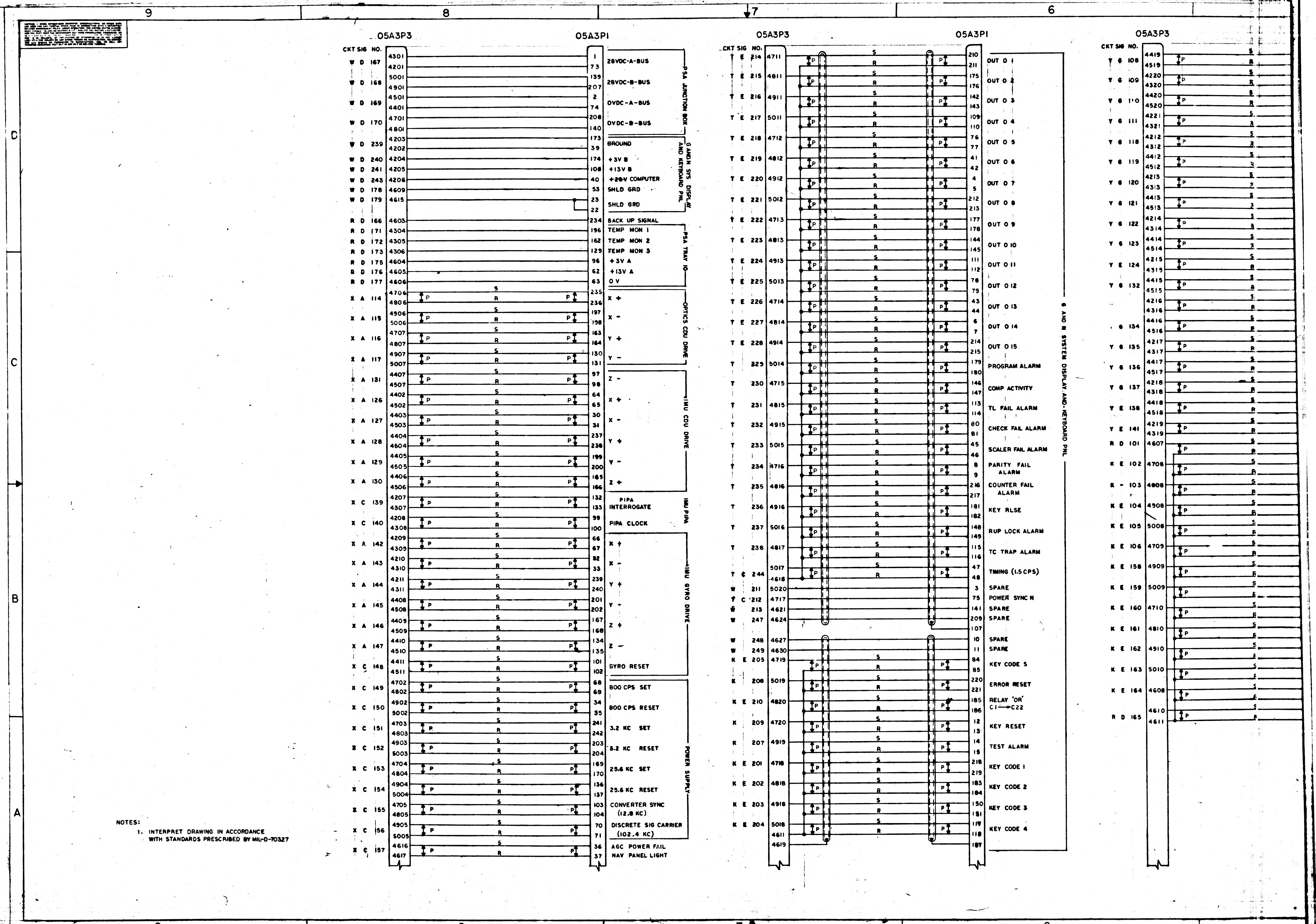
CODE IDENT NO. — SIZE J NASA DRAWING NO. 1006181
SCALE — WT — SHEET 1 OF 1

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

E3


6
5
4
3
2
05A3P1
05A3P3
05A3P1
05A3P3
05A3J1
A5A3P3
05A3J1
CKT SIG NO.
OUT 0 1
OUT 0 2
OUT 0 3
OUT 0 4
OUT 0 5
OUT 0 6
OUT 0 7
OUT 0 8
OUT 0 9
OUT 0 10
OUT 0 11
OUT 0 12
OUT 0 13
OUT 0 14
OUT 0 15
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
TIMING (1.5CPS)
SPARE
POWER SYNC N
SPARE
SPARE
SPARE
SPARE
KEY CODE 5
ERROR RESET
RELAY "OR" C1→C22
KEY RESET
TEST ALARM
KEY CODE 1
KEY CODE 2
KEY CODE 3
KEY CODE 4
G AND N SYSTEM DISPLAY AND KEYBOARD PNL
X +
X -
Y +
Y -
OPTICS CDU ENCODER
X +
X -
Y +
Y -
Z +
Z -
FAIL
IMU CDU ENCODER
ΔVX +
ΔVX -
ΔVY +
ΔVY -
ΔVZ +
ΔVZ -
PIPA FAIL
IMU FAIL
IMU PIPA
SWITCH COMMON
MARK
MARK
ZERO ENCODER
OPTMS1
OPTMS2
OPTICS MODE SWITCH
K1
K2
K3
K4
K12
K5
TR SWITCH
COMMON
IMU MODULE SWITCH
S
R
P
SPARES
SHIELD GROUND
CNSHLD
CNTRL1
CNTRL2
MT SHLD
MT HI
MT LO
POWER SYNC (800 CPS)
TIMING (1.5CPS)
SPACE CRAFT DISPLAY AND KEYBOARD PNL
1006181
MASTER
INCHES
PHOTOGRAPHIC SCALE ONLY


05A3P3
05A3P1
CKT SIG NO.
28VDC-A-BUS
28VDC-B-BUS
0VDC-A-BUS
0VDC-B-BUS
PSA JUNCTION BOX
GROUND
+3V B
+13V B
+28V COMPUTER
SHLD GRD
SHLD GRD
G AND N SYS DISPLAY AND KEYBOARD PNL
BACK UP SIGNAL
TEMP MON 1
TEMP MON 2
TEMP MON 3
+3V A
+13V A
0 V
PSA TRAY 10
X +
X -
Y +
Y -
OPTICS CDU DRIVE
Z -
X +
X -
Y +
Y -
Z +
IMU CDU DRIVE
PIPA INTERROGATE
PIPA CLOCK
IMU PIPA
X +
X -
Y +
Y -
Z +
Z -
IMU GYRO DRIVE
GYRO RESET
800 CPS SET
800 CPS RESET
3.2 KC SET
3.2 KC RESET
25.6 KC SET
25.6 KC RESET
CONVERTER SYNC (12.8 KC)
DISCRETE SIG CARRIER (102.4 KC)
POWER SUPPLY
AGC POWER FAIL
NAV PANEL LIGHT
OUT 0 1
OUT 0 2
OUT 0 3
OUT 0 4
OUT 0 5
OUT 0 6
OUT 0 7
OUT 0 8
OUT 0 9
OUT 0 10
OUT 0 11
OUT 0 12
OUT 0 13
OUT 0 14
OUT 0 15
PROGRAM ALARM
COMP ACTIVITY
TL FAIL ALARM
CHECK FAIL ALARM
SCALER FAIL ALARM
PARITY FAIL ALARM
COUNTER FAIL ALARM
KEY RLSE
RUP LOCK ALARM
TC TRAP ALARM
TIMING (1.5 CPS)
SPARE
POWER SYNC N
SPARE
SPARE
SPARE
SPARE
KEY CODE 5
ERROR RESET
RELAY "OR" C1→C22
KEY RESET
TEST ALARM
KEY CODE 1
KEY CODE 2
KEY CODE 3
KEY CODE 4
G AND N SYSTEM DISPLAY AND KEYBOARD PNL
S
R
P
9
8
7
6
D
C
B
A

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
PHOTOGRAPHIC SCALE ONLY

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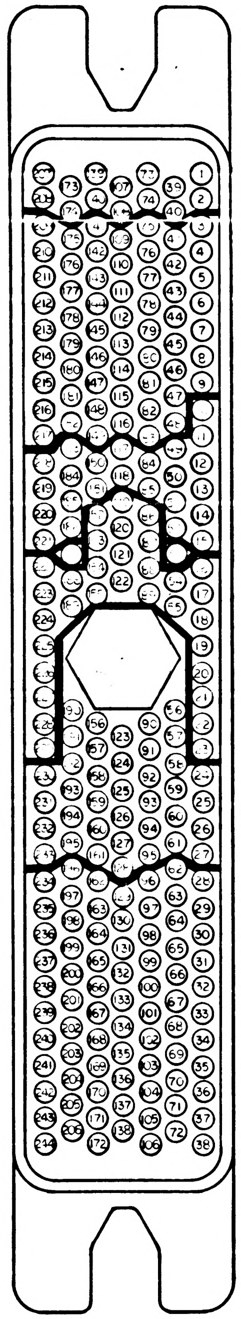
REVISIONS 07643			
SYM	DESCRIPTION	DATE	APPROVAL



MALE RECEPTACLE
CONTACT SIDE
NORMAL POLARIZATION

1	NOT AVAILABLE FOR USE
2	NOT AVAILABLE FOR USE
3	211
4	220 SIG
5	220 RET
6	227 SIG
7	227 RET
8	234 SIG
9	234 RET
10	248
11	249
12	
13	
14	
15	
16	54 SIG
17	
18	54 RET
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	ERROR DETECT LIGHT
29	
30	
31	ROLL ERROR OFFSET LO
32	ROLL ERROR BODY HI
33	YAW ERROR BODY HI
34	YAW ERROR SHLD
35	PITCH ERROR LO
36	PITCH ERROR HI
37	
38	NOT AVAILABLE FOR USE
39	239
40	243
41	219 SIG
42	219 RET
43	226 SIG
44	226 RET
45	233 SIG
46	233 RET
47	244 SIG
48	244 RET
49	206 SIG
50	206 RET
51	246 SIG
52	246 RET
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	OVDC SP CRAFT (26 RET)
63	IMU TEMP LIGHT
64	
65	
66	ROLL ERROR OFFSET HI
67	ROLL ERROR SHLD
68	YAW ERROR OFFSET HI
69	YAW ERROR BODY LO
70	PITCH ERROR SHLD
71	NOT AVAILABLE FOR USE
72	
73	NOT AVAILABLE FOR USE
74	
75	212
76	218 SIG
77	218 RET
78	225 SIG
79	225 RET
80	232 SIG
81	232 RET
82	242 SIG
83	242 RET
84	205 SIG
85	205 RET
86	
87	
88	
89	
90	17 SIG
91	17 RET
92	26 SIG
93	
94	11 SIG
95	11 RET
96	GIMBAL LOCK LIGHT
97	MIN IMPULSE + YAW
98	MIN IMPULSE - YAW
99	MIN IMPULSE TOG SW
100	MIN IMPULSE ENABLE
101	S/C WARN LIGHT
102	S/C CAUT LIGHT
103	LOCK CDU RELAY CONT
104	FINE ALIGN RELAY CONT
105	
106	NOT AVAILABLE FOR USE
107	245
108	241
109	217 SIG
110	217 RET
111	224 SIG
112	224 RET
113	231 SIG
114	231 RET
115	238 SIG
116	238 RET
117	204 SIG
118	204 RET
119	
120	
121	
122	
123	24 SIG
124	24 RET
125	25 SIG
126	25 RET
127	
128	
129	
130	MIN IMPULSE YAW
131	MIN IMPULSE + ROLL
132	MIN IMPULSE EN RET
133	
134	+28 VDC SPACECRAFT
135	
136	IMU MODE RELAY COMM
137	NOT AVAILABLE FOR USE
138	
139	NOT AVAILABLE FOR USE
140	
141	213
142	216 SIG
143	216 RET
144	223 SIG
145	223 RET
146	230 SIG
147	230 RET
148	237 SIG
149	237 RET
150	203 SIG
151	203 RET
152	
153	
154	
155	
156	
157	
158	
159	
160	
161	
162	
163	MIN IMPULSE + PITCH
164	MIN IMPULSE - ROLL
165	MIN IMPULSE ROLL
166	SIN AOG 1X LO(S2)
167	SIN AOG 1X HI(S4)
168	SIN AMG 1X LO(S2)
169	SIN AMG 1X HI(S4)
170	SIN AIG 1X LO(S2)
171	SIN AIG 1X HI(S4)
172	NOT AVAILABLE FOR USE
173	251
174	240
175	215 SIG
176	215 RET
177	222 SIG
178	222 RET
179	229 SIG
180	229 RET
181	236 SIG
182	236 RET
183	202 SIG
184	202 RET
185	210 SIG
186	210 RET
187	250
188	
189	
190	14 SIG
191	14 RET
192	15 SIG
193	15 RET
194	16 SIG
195	16 RET
196	
197	MIN IMPULSE - PITCH
198	MIN IMPULSE PITCH
199	COS AOG 1X HI(S3)
200	COS AOG 1X LO(S1)
201	COS AMG 1X HI(S3)
202	COS AMG 1X LO(S1)
203	COS AIG 1X LO(S1)
204	COS AIG 1X HI(S3)
205	NOT AVAILABLE FOR USE
206	
207	NOT AVAILABLE FOR USE
208	
209	247
210	214 SIG
211	214 RET
212	221 SIG
213	221 RET
214	228 SIG
215	228 RET
216	235 SIG
217	235 RET
218	201 SIG
219	201 RET
220	208 SIG
221	208 RET
222	
223	
224	1 SIG
225	NOT AVAILABLE FOR USE
226	1 RET
227	
228	
229	
230	
231	
232	
233	
234	
235	
236	
237	
238	
239	
240	
241	
242	IMU 28V 800CPS LO
243	IMU 28V 800CPS HI
244	NOT AVAILABLE FOR USE

CABLE GROUP I NOT SHIELDED

CABLE GROUP II SHIELDED

CABLE GROUP III SHIELDED

CABLE GROUP IV NOT SHIELDED

CABLE GROUP V SHIELDED

CABLE GROUP VI

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN P. Rosaus DATE 9 MAR 64
CHECKED 27 Mar 64
APPROVAL Donald J
APPROVAL Eldon C Hall 27 Mar 64
NASA APPROVAL 4/14/64
MIT APPROVAL
MIT APPROVAL R Wolf 4/1/64

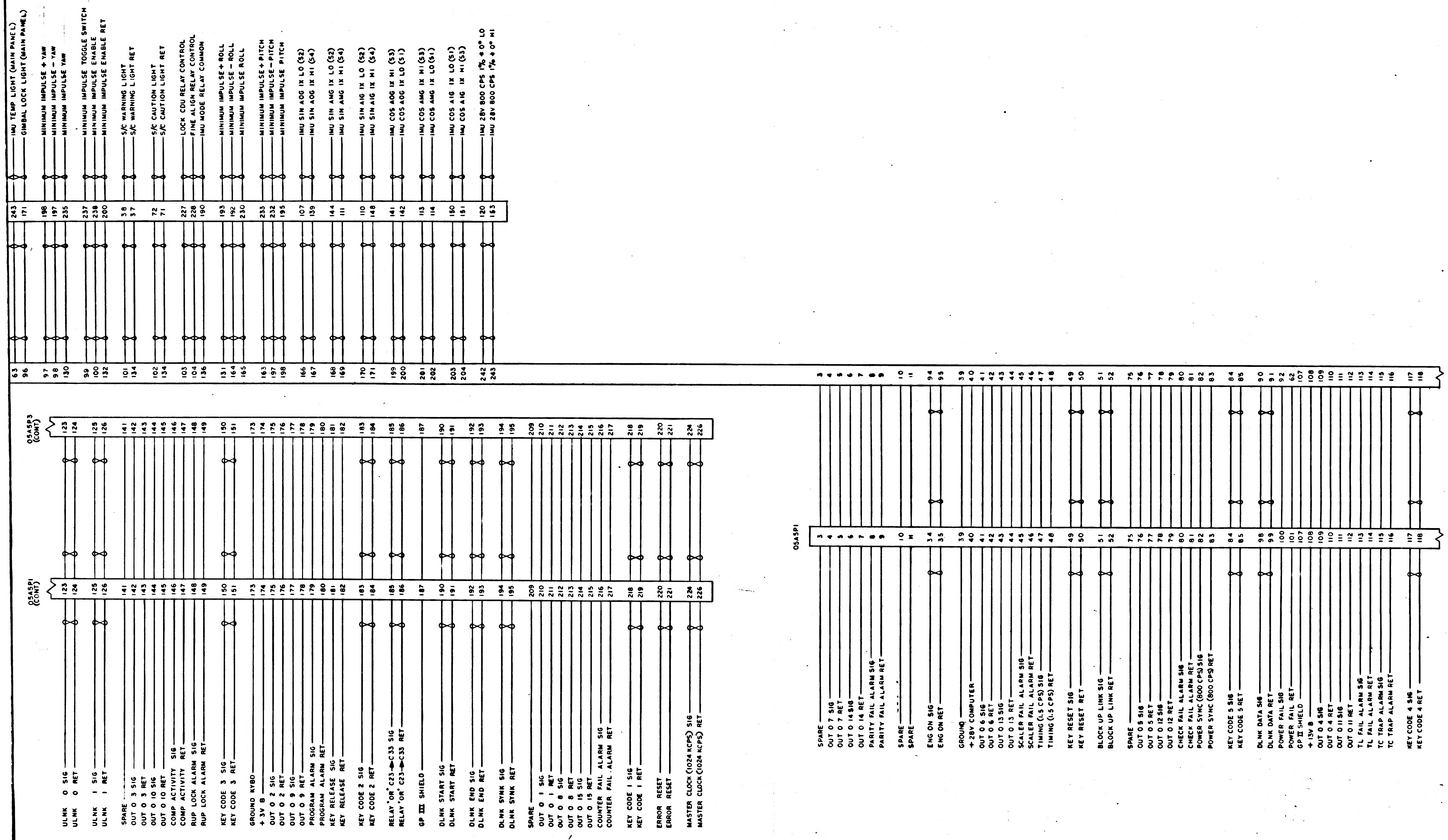
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SIGNAL PIN ASSIGNMENT
05A5P3 CONNECTOR (G&N TO C/M)

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006182
SCALE NONE
WT
SHEET 1 OF 1

1006183 —

SYM	DESCRIPTION	DATE	APPROVED
	REVISIONS		


IMU TEMP LIGHT (MAIN PANEL)
GIMBAL LOCK LIGHT (MAIN PANEL)
MINIMUM IMPULSE + YAW
MINIMUM IMPULSE − YAW
MINIMUM IMPULSE YAW
MINIMUM IMPULSE TOGGLE SWITCH
MINIMUM IMPULSE ENABLE
MINIMUM IMPULSE ENABLE RET
S/C WARNING LIGHT
S/C WARNING LIGHT RET
S/C CAUTION LIGHT
S/C CAUTION LIGHT RET
LOCK CDU RELAY CONTROL
FINE ALIGN RELAY CONTROL
IMU MODE RELAY COMMON
MINIMUM IMPULSE + ROLL
MINIMUM IMPULSE − ROLL
MINIMUM IMPULSE ROLL
MINIMUM IMPULSE + PITCH
MINIMUM IMPULSE − PITCH
MINIMUM IMPULSE PITCH
IMU SIN AOG IX LO (S2)
IMU SIN AOG IX HI (S4)
IMU SIN AMG IX LO (S2)
IMU SIN AMG IX HI (S4)
IMU SIN AIG IX LO (S2)
IMU SIN AIG IX HI (S4)
IMU COS AOG IX HI (S3)
IMU COS AOG IX LO (S1)
IMU COS AMG IX HI (S3)
IMU COS AMG IX LO (S1)
IMU COS AIG IX LO (S1)
IMU COS AIG IX HI (S3)
IMU 28V 800 CPS 1% ∠ 0° LO
IMU 28V 800 CPS 1% ∠ 0° HI
243 171 198 197 235 237 238 200 38 37 72 71 227 228 190 193 192 230 233 232 195 107 139 144 111 110 148 141 142 113 114 150 151 120 153
63 96 97 98 130 99 100 132 101 134 102 134 103 104 136 131 164 165 163 197 198 166 167 168 169 170 171 199 200 201 202 203 204 242 243
05A5P3 (CONT)
123 124 125 126 141 142 143 144 145 146 147 148 149 150 151 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 190 191 192 193 194 195 209 210 211 212 213 214 215 216 217 218 219 220 221 224 226
05A5P1 (CONT)
123 124 125 126 141 142 143 144 145 146 147 148 149 150 151 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 190 191 192 193 194 195 209 210 211 212 213 214 215 216 217 218 219 220 221 224 226
ULNK 0 SIG
ULNK 0 RET
ULNK 1 SIG
ULNK 1 RET
SPARE
OUT 0 3 SIG
OUT 0 3 RET
OUT 0 10 SIG
OUT 0 10 RET
COMP ACTIVITY SIG
COMP ACTIVITY RET
RUP LOCK ALARM SIG
RUP LOCK ALARM RET
KEY CODE 3 SIG
KEY CODE 3 RET
GROUND KYBD
+ 3V B
OUT 0 2 SIG
OUT 0 2 RET
OUT 0 9 SIG
OUT 0 9 RET
PROGRAM ALARM SIG
PROGRAM ALARM RET
KEY RELEASE SIG
KEY RELEASE RET
KEY CODE 2 SIG
KEY CODE 2 RET
RELAY 'OR' C23→C33 SIG
RELAY 'OR' C23→C33 RET
GP III SHIELD
DLNK START SIG
DLNK START RET
DLNK END SIG
DLNK END RET
DLNK SYNK SIG
DLNK SYNK RET
SPARE
OUT 0 1 SIG
OUT 0 1 RET
OUT 0 8 SIG
OUT 0 8 RET
OUT 0 15 SIG
OUT 0 15 RET
COUNTER FAIL ALARM SIG
COUNTER FAIL ALARM RET
KEY CODE 1 SIG
KEY CODE 1 RET
ERROR RESET
ERROR RESET
MASTER CLOCK (1024 KCPS) SIG
MASTER CLOCK (1024 KCPS) RET
3 4 5 6 7 8 9 10 11 94 95 39 40 41 42 43 44 45 46 47 48 49 50 51 52 75 76 77 78 79 80 81 82 83 84 85 90 91 92 62 107 108 109 110 111 112 113 114 115 116 117 118
05A5P1
3 4 5 6 7 8 9 10 11 34 35 39 40 41 42 43 44 45 46 47 48 49 50 51 52 75 76 77 78 79 80 81 82 83 84 85 98 99 100 101 107 108 109 110 111 112 113 114 115 116 117 118
SPARE
OUT 0 7 SIG
OUT 0 7 RET
OUT 0 14 SIG
OUT 0 14 RET
PARITY FAIL ALARM SIG
PARITY FAIL ALARM RET
SPARE
SPARE
ENG ON SIG
ENG ON RET
GROUND
+ 28V COMPUTER
OUT 0 6 SIG
OUT 0 6 RET
OUT 0 13 SIG
OUT 0 13 RET
SCALER FAIL ALARM SIG
SCALER FAIL ALARM RET
TIMING (1.5 CPS) SIG
TIMING (1.5 CPS) RET
KEY RESET SIG
KEY RESET RET
BLOCK UP LINK SIG
BLOCK UP LINK RET
SPARE
OUT 0 5 SIG
OUT 0 5 RET
OUT 0 12 SIG
OUT 0 12 RET
CHECK FAIL ALARM SIG
CHECK FAIL ALARM RET
POWER SYNC (800 CPS) SIG
POWER SYNC (800 CPS) RET
KEY CODE 5 SIG
KEY CODE 5 RET
DLNK DATA SIG
DLNK DATA RET
POWER FAIL SIG
POWER FAIL RET
GP II SHIELD
+ 13V B
OUT 0 4 SIG
OUT 0 4 RET
OUT 0 11 SIG
OUT 0 11 RET
TL FAIL ALARM SIG
TL FAIL ALARM RET
TC TRAP ALARM SIG
TC TRAP ALARM RET
KEY CODE 4 SIG
KEY CODE 4 RET
4
3
2
1
D
C
B
A

1006183 —

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

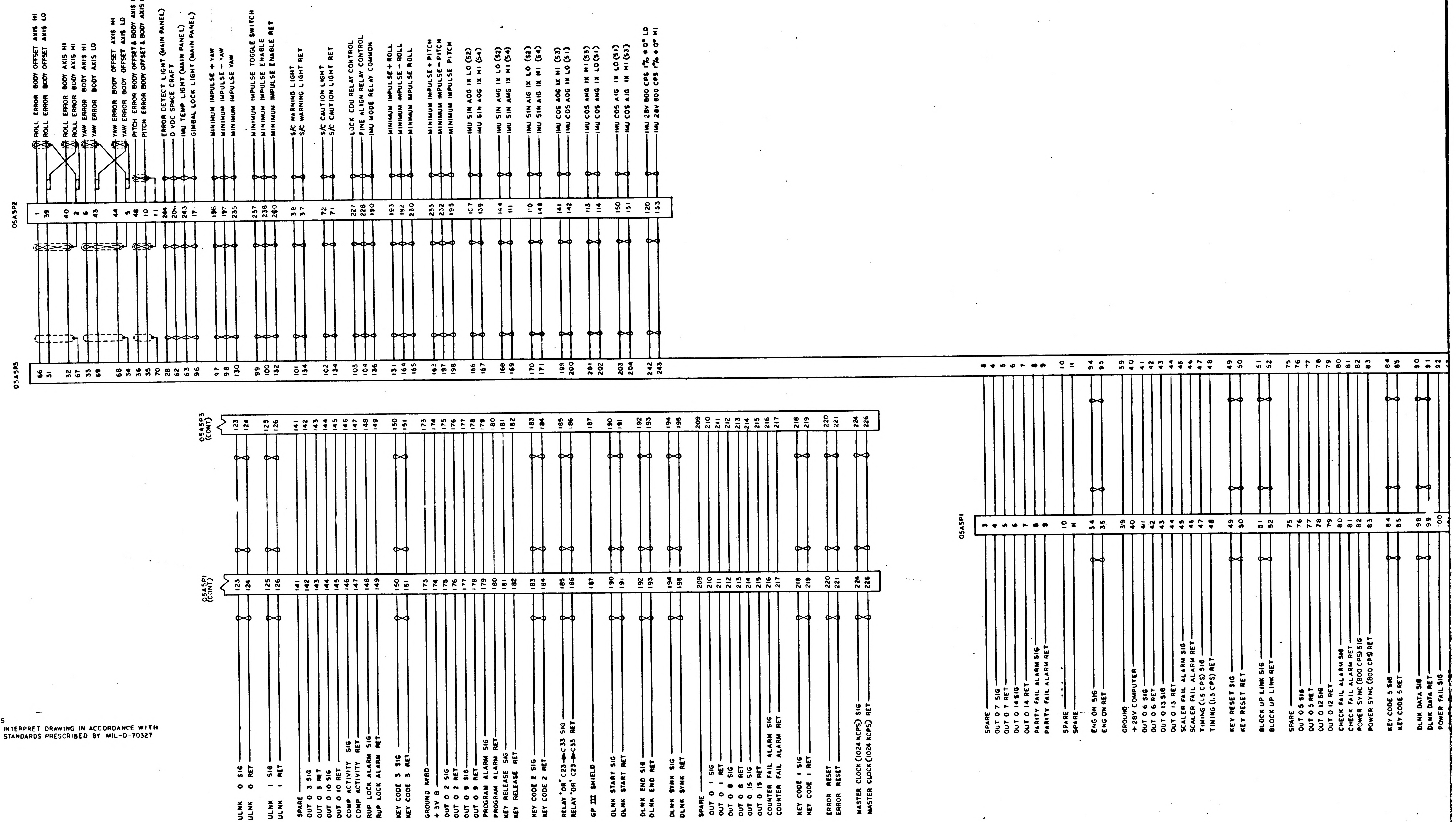
MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN R. Dagianco DATE 6 MARCH
CHECKED R. Rogers
APPROVAL 2/28/64
APPROVAL Eldon C. Hall 2/28/64
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INTERCONNECTION DIAGRAM
CONNECTOR COVER PLATE ASSEMBLY

CODE IDENT NO. —
SIZE J
NASA DRAWING NO. 1006183
SCALE NONE
WT
SHEET 1 OF 1

F-2 / 2

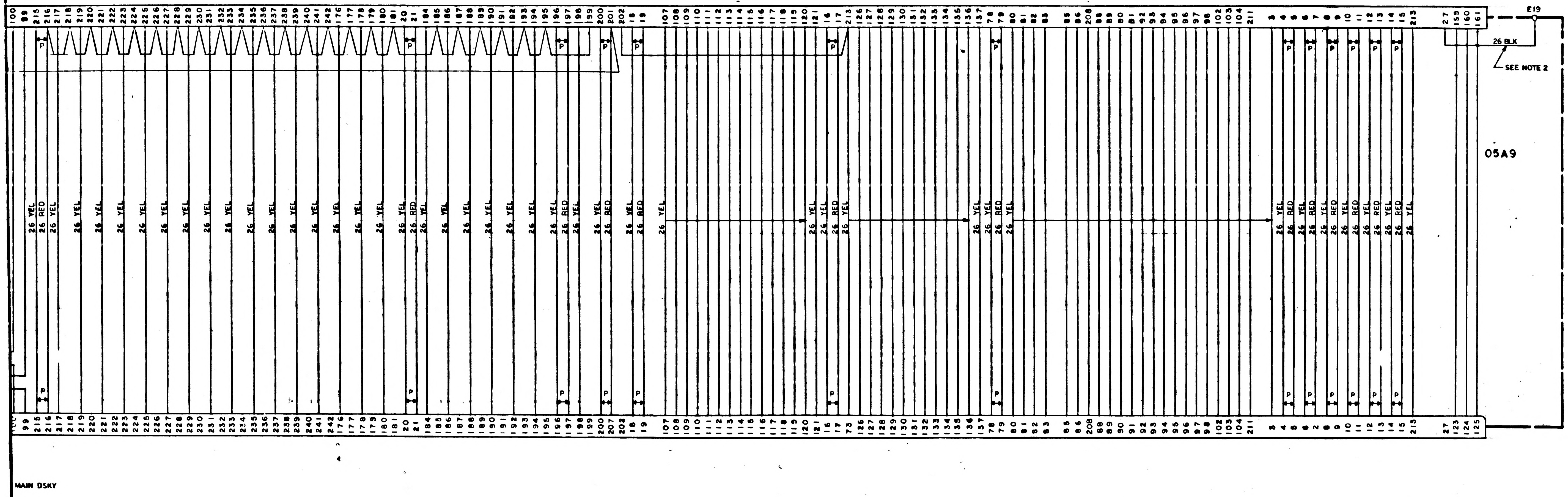

5
4
3
2
D
C
B
A
05A5P2
1 39 40 2 6 43 44 5 48 10 11 244 206 243 171 198 197 235 237 238 200 38 37 72 71 227 228 190 193 192 230 233 232 195 107 139 144 111 110 148 141 142 113 114 150 151 120 153
ROLL ERROR BODY OFFSET AXIS HI
ROLL ERROR BODY OFFSET AXIS LO
ROLL ERROR BODY AXIS HI
ROLL ERROR BODY AXIS HI
YAW ERROR BODY AXIS HI
YAW ERROR BODY AXIS LO
YAW ERROR BODY OFFSET AXIS HI
YAW ERROR BODY OFFSET AXIS LO
PITCH ERROR BODY OFFSET & BODY AXIS HI
PITCH ERROR BODY OFFSET & BODY AXIS LO
ERROR DETECT LIGHT (MAIN PANEL)
0 VDC SPACE CRAFT
IMU TEMP LIGHT (MAIN PANEL)
GIMBAL LOCK LIGHT (MAIN PANEL)
MINIMUM IMPULSE + YAW
MINIMUM IMPULSE – YAW
MINIMUM IMPULSE YAW
MINIMUM IMPULSE TOGGLE SWITCH
MINIMUM IMPULSE ENABLE
MINIMUM IMPULSE ENABLE RET
S/C WARNING LIGHT
S/C WARNING LIGHT RET
S/C CAUTION LIGHT
S/C CAUTION LIGHT RET
LOCK CDU RELAY CONTROL
FINE ALIGN RELAY CONTROL
IMU MODE RELAY COMMON
MINIMUM IMPULSE + ROLL
MINIMUM IMPULSE – ROLL
MINIMUM IMPULSE ROLL
MINIMUM IMPULSE + PITCH
MINIMUM IMPULSE – PITCH
MINIMUM IMPULSE PITCH
IMU SIN AOG IX LO (S2)
IMU SIN AOG IX HI (S4)
IMU SIN AMG IX LO (S2)
IMU SIN AMG IX HI (S4)
IMU SIN AIG IX LO (S2)
IMU SIN AIG IX HI (S4)
IMU COS AOG IX HI (S3)
IMU COS AOG IX LO (S1)
IMU COS AMG IX HI (S3)
IMU COS AMG IX LO (S1)
IMU COS AIG IX LO (S1)
IMU COS AIG IX HI (S3)
IMU 28V 800 CPS 1% ∢ 0° LO
IMU 28V 800 CPS 1% ∢ 0° HI
05A5P3
66 31 32 67 33 69 68 34 36 35 70 28 62 63 96 97 98 130 99 100 132 101 134 102 134 103 104 136 131 164 165 163 197 198 166 167 168 169 170 171 199 200 201 202 203 204 242 243
05A5P3 (CONT)
123 124 125 126 141 142 143 144 145 146 147 148 149 150 151 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 190 191 192 193 194 195 209 210 211 212 213 214 215 216 217 218 219 220 221 224 226
05A5P1 (CONT)
123 124 125 126 141 142 143 144 145 146 147 148 149 150 151 174 175 176 177 178 179 180 181 182 183 184 185 186 190 191 192 193 194 195 209 210 211 212 213 214 215 216 217 218 219 220 221 224 226
ULNK 0 SIG
ULNK 0 RET
ULNK 1 SIG
ULNK 1 RET
SPARE
OUT 0 3 SIG
OUT 0 3 RET
OUT 0 10 SIG
OUT 0 10 RET
COMP ACTIVITY SIG
COMP ACTIVITY RET
RUP LOCK ALARM SIG
RUP LOCK ALARM RET
KEY CODE 3 SIG
KEY CODE 3 RET
GROUND KYBD
+ 3V B
OUT 0 2 SIG
OUT 0 2 RET
OUT 0 9 SIG
OUT 0 9 RET
PROGRAM ALARM SIG
PROGRAM ALARM RET
KEY RELEASE SIG
KEY RELEASE RET
KEY CODE 2 SIG
KEY CODE 2 RET
RELAY "OR" C23→C33 SIG
RELAY "OR" C23→C33 RET
GP III SHIELD
DLNK START SIG
DLNK START RET
DLNK END SIG
DLNK END RET
DLNK SYNK SIG
DLNK SYNK RET
SPARE
OUT 0 1 SIG
OUT 0 1 RET
OUT 0 8 SIG
OUT 0 8 RET
OUT 0 15 SIG
OUT 0 15 RET
COUNTER FAIL ALARM SIG
COUNTER FAIL ALARM RET
KEY CODE 1 SIG
KEY CODE 1 RET
ERROR RESET
ERROR RESET
MASTER CLOCK (1024 KCPS) SIG
MASTER CLOCK (1024 KCPS) RET
3 4 5 6 7 8 9 10 11 94 95 39 40 41 42 43 44 45 46 47 48 49 50 51 52 75 76 77 78 79 80 81 82 83 84 85 90 91 92
05A5P1
3 4 5 6 7 8 9 10 11 34 35 39 40 41 42 43 44 45 46 47 48 49 50 51 52 75 76 77 78 79 80 81 82 83 84 85 98 99 100
SPARE
OUT 0 7 SIG
OUT 0 7 RET
OUT 0 14 SIG
OUT 0 14 RET
PARITY FAIL ALARM SIG
PARITY FAIL ALARM RET
SPARE
SPARE
ENG ON SIG
ENG ON RET
GROUND
+ 28V COMPUTER
OUT 0 6 SIG
OUT 0 6 RET
OUT 0 13 SIG
OUT 0 13 RET
SCALER FAIL ALARM SIG
SCALER FAIL ALARM RET
TIMING (1.5 CPS) SIG
TIMING (1.5 CPS) RET
KEY RESET SIG
KEY RESET RET
BLOCK UP LINK SIG
BLOCK UP LINK RET
SPARE
OUT 0 5 SIG
OUT 0 5 RET
OUT 0 12 SIG
OUT 0 12 RET
CHECK FAIL ALARM SIG
CHECK FAIL ALARM RET
POWER SYNC (800 CPS) SIG
POWER SYNC (800 CPS) RET
KEY CODE 5 SIG
KEY CODE 5 RET
DLNK DATA SIG
DLNK DATA RET
POWER FAIL SIG
113
TL FAIL ALARM SIG

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	QTY REQD
		MATERIAL	
		HEAT TREATMENT	
NEXT ASSY	USED ON	FINAL FINISH	
APPLICATION			

1006183 F1/2

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REVISED PER TDRR 20444				



1006184 A

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

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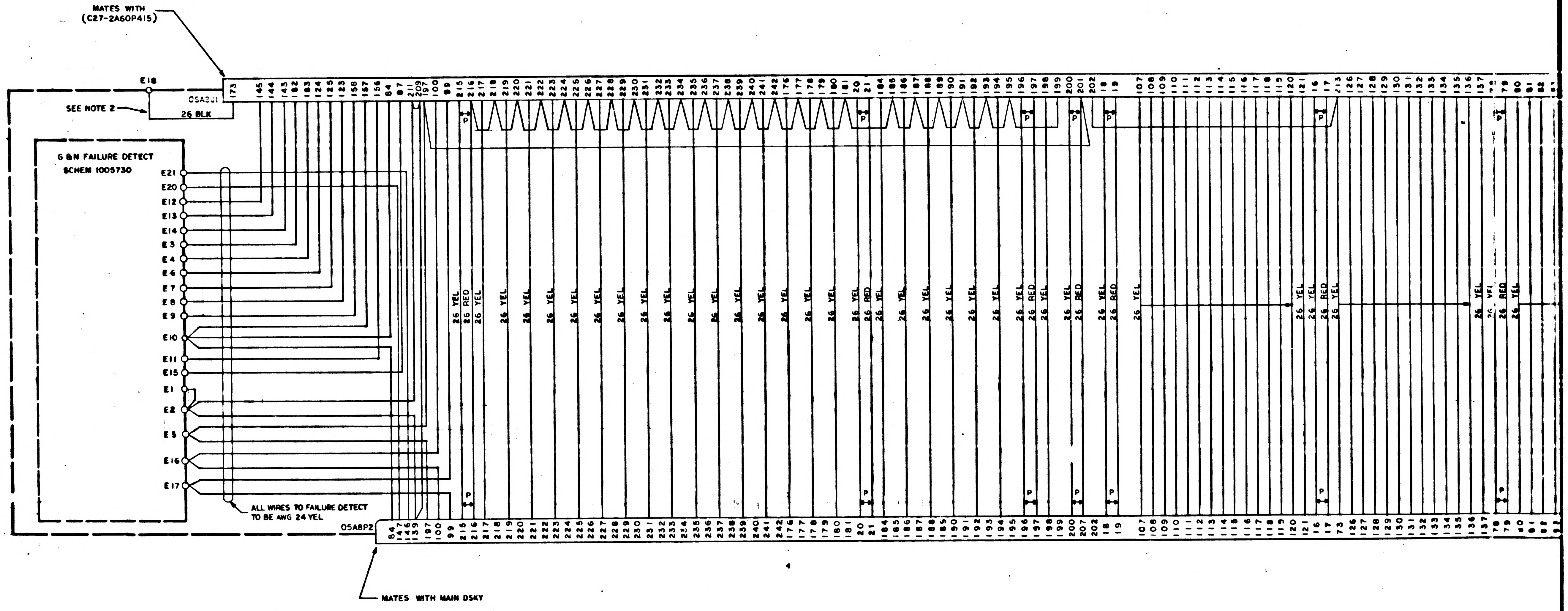
DRAWN A. Dillon 16 APR 65
CHECKED
APPROVED
APPROVED
APPROVED MIT
APPROVED MSC

WIRING DIAGRAM,
G&N FAILURE DETECT

CODE IDENT NO. 80230
SIZE J
DRAWING NO. 1006184
SCALE
SHEET 1 OF 1

MASTER


MATES WITH
(C27-2A60P415)
E18
SEE NOTE 2
05A8J1
26 BLK
G &N FAILURE DETECT
SCHEM 1005730
E21
E20
E12
E13
E14
E3
E4
E6
E7
E8
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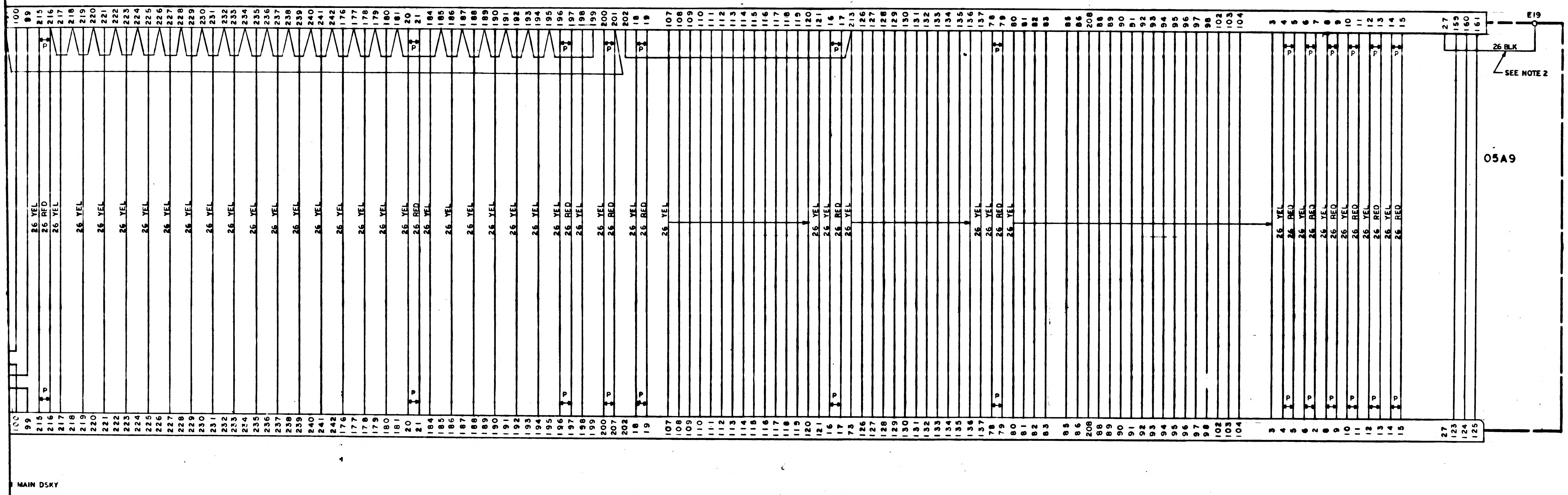
E10
E11
E15
E1
E2
E5
E16
E17
ALL WIRES TO FAILURE DETECT
TO BE AWG 24 YEL
05A8P2
MATES WITH MAIN DSKY
P
26 YEL
26 RED

OTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CASE GROUND LEADS SHOULD BE AS SHORT AS POSSIBLE

SYM	ZONE	DESCRIPTION	BY	CHK	DATE	APPROVED
A		REVISED PER TDRR 20444			3/4/65	
B		REVISED PER TDRR 21816			7/3/65	

REVISIONS 11276



QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
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MATERIAL

NEXT ASSY | USED ON
APPLICATION

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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN A. Di Lora 16 Nov 64
CHECKED
APPROVED
APPROVED
APPROVED MIT 13 Apr 65
APPROVED MSC

WIRING DIAGRAM, G&N FAILURE DETECT

CODE IDENT NO. 80230 SIZE J DRAWING NO. 1006184

SCALE SHEET OF

1006184 B

F2/2

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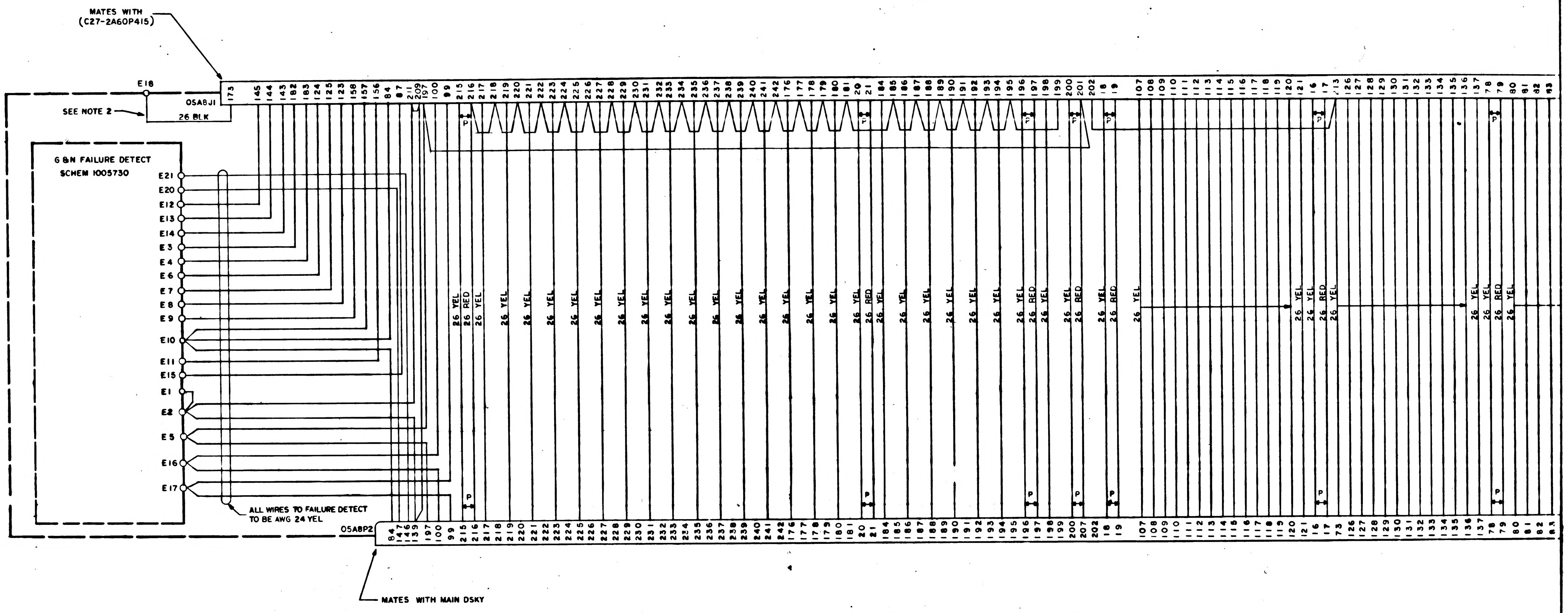
MATES WITH
(C27-2A60P415)
E18
SEE NOTE 2
05A8J1
26 BLK
173 145 144 143 182 183 124 125 123 158 157 156 84 87 211 209 197 100 99 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 176 177 178 179 180 181 20 21 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 18 19 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 16 17 213 126 127 128 129 130 131 132 133 134 135 136 137 78 79 80 81 82 83
G&N FAILURE DETECT
SCHEM 1005730
E21
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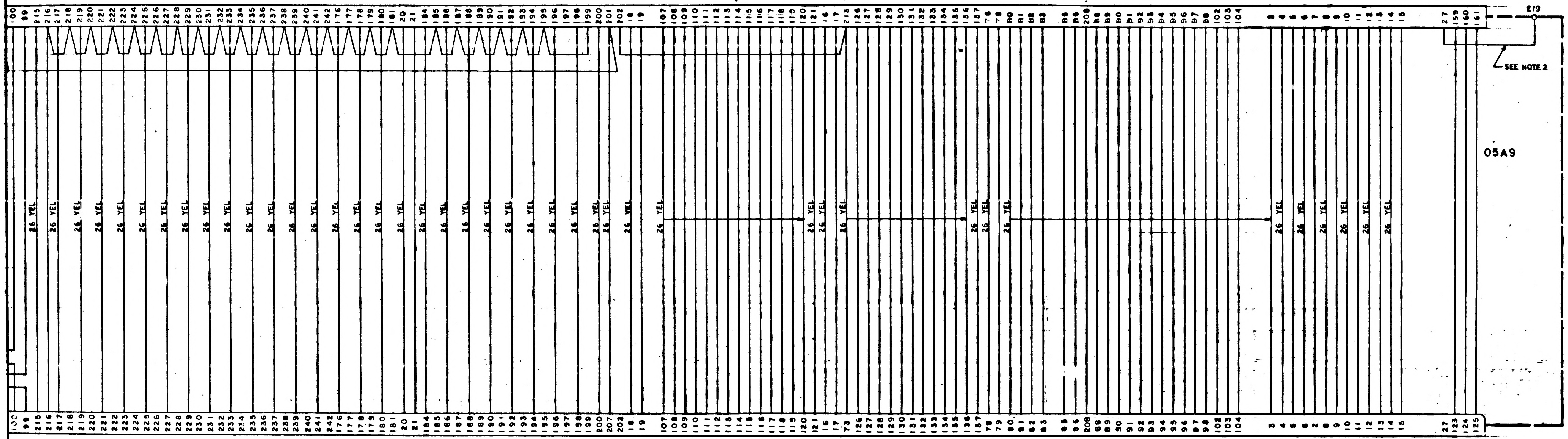
E11
E15
E1
E2
E5
E16
E17
P
26 YEL
26 RED
ALL WIRES TO FAILURE DETECT
TO BE AWG 24 YEL
05A8P2
84 147 146 139 197 100 99 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 176 177 178 179 180 181 20 21 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 207 202 18 19 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 16 17 73 126 127 128 129 130 131 132 133 134 135 136 137 78 79 80 81 82 83
MATES WITH MAIN DSKY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CASE GROUND LEADS SHOULD BE AS SHORT AS POSSIBLE

1006184 B F1/2

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REVISED PER TDRR 20444				
B		REVISED PER TDRR 21816			11/3/65	
C		REVISED PER TDRR 22459				



MASTER

F 2 / 2

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL

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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

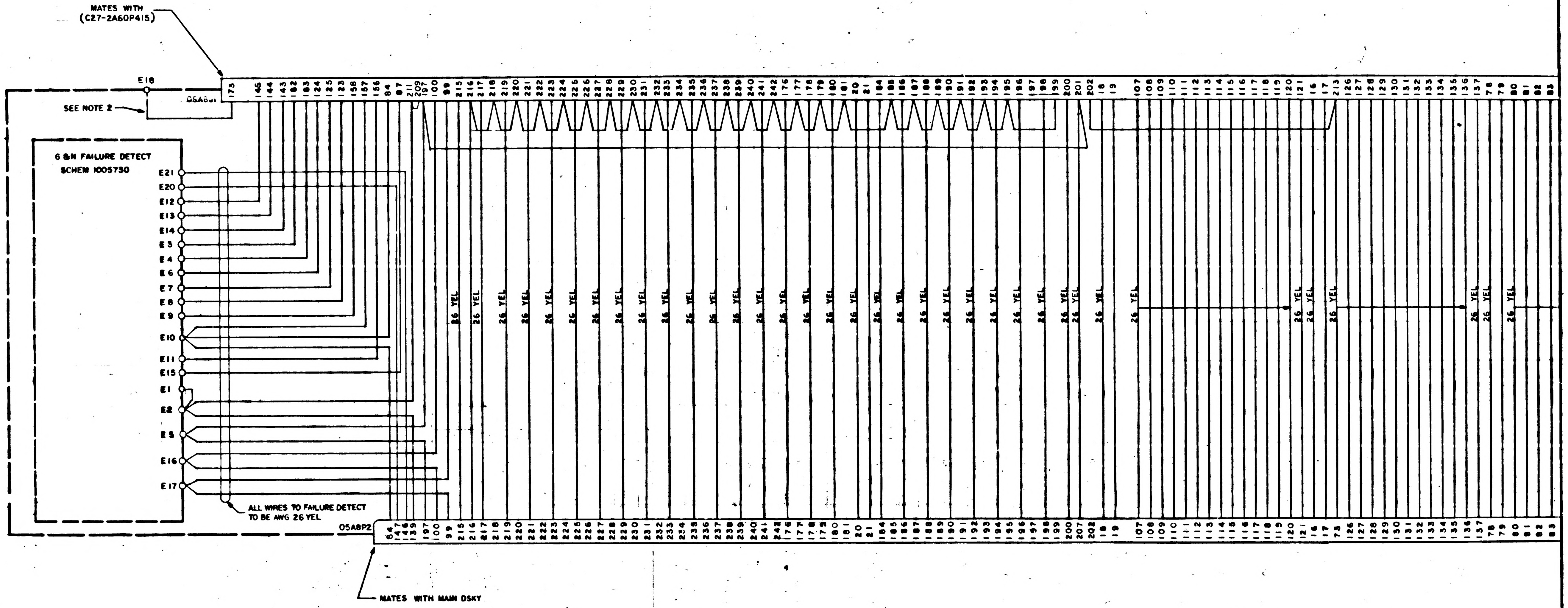
DRAWN
CHECKED
APPROVED
APPROVED
APPROVED MIT
APPROVED MSC
DATE

WIRING DIAGRAM,
G&N FAILURE DETECT

CODE IDENT NO. 80230 | SIZE J | DRAWING NO. 1006184
SCALE | SHEET 1 OF 1

1006184 C

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.


6
5
4
3
D
C
B
MATES WITH (C27-2A60P415)
E18
SEE NOTE 2
05A8J1
173 145 144 143 182 183 124 125 123 158 157 156 84 87 211 209 197 100 99 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 176 177 178 179 180 181 20 21 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 18 19 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 16 17 213 126 127 128 129 130 131 132 133 134 135 136 137 78 79 80 81 82 83
6 &N FAILURE DETECT
SCHEM 1005730
E21
E20
E12
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E14
E3
E4
E6
E7
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E2
E5
E16
E17
26 YEL
ALL WIRES TO FAILURE DETECT TO BE AWG 26 YEL
05A8P2
84 147 146 139 197 100 99 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 176 177 178 179 180 181 20 21 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 207 202 18 19 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 16 17 73 126 127 128 129 130 131 132 133 134 135 136 137 78 79 80 81 82 83
MATES WITH MAIN DSKY

A

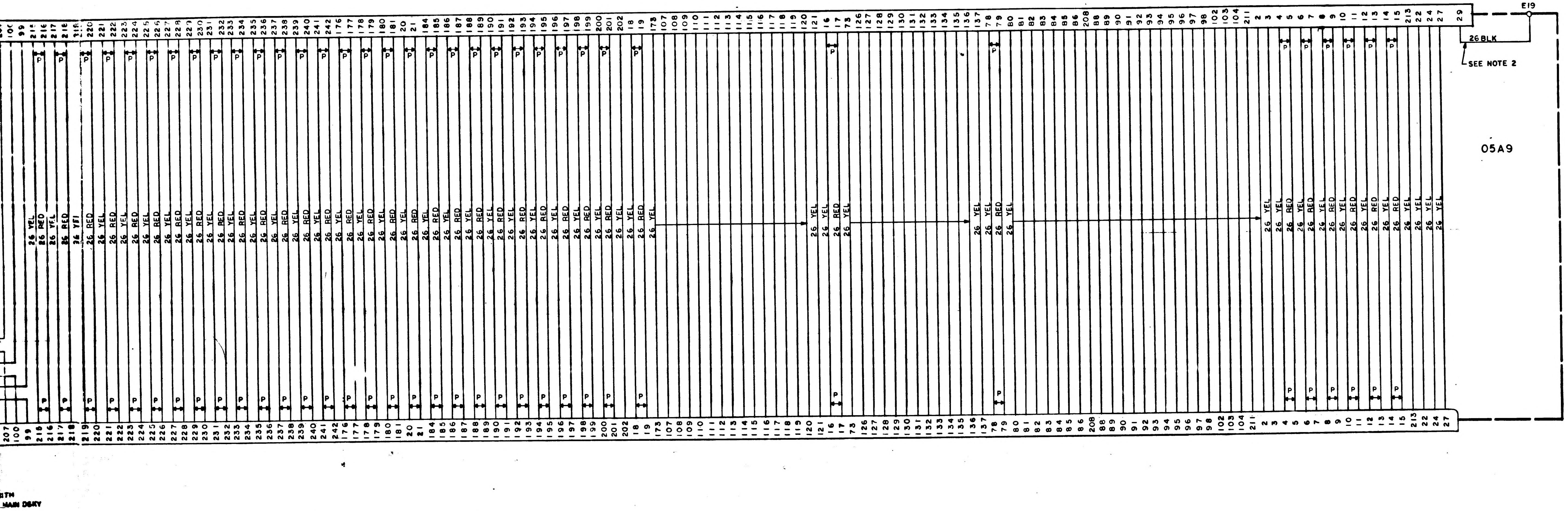
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CASE GROUND LEADS SHOULD BE AS SHORT AS POSSIBLE

1006184 C 1/2

REVISIONS 18286

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED



QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL

NEXT ASSY | USED ON
APPLICATION

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INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN A. Di Lau 16 MAR 65
CHECKED
APPROVED
APPROVED Ellen C Hall
APPROVED MIT W Kupfer 13 Apr 65
APPROVED MSC W J Kline
DATE

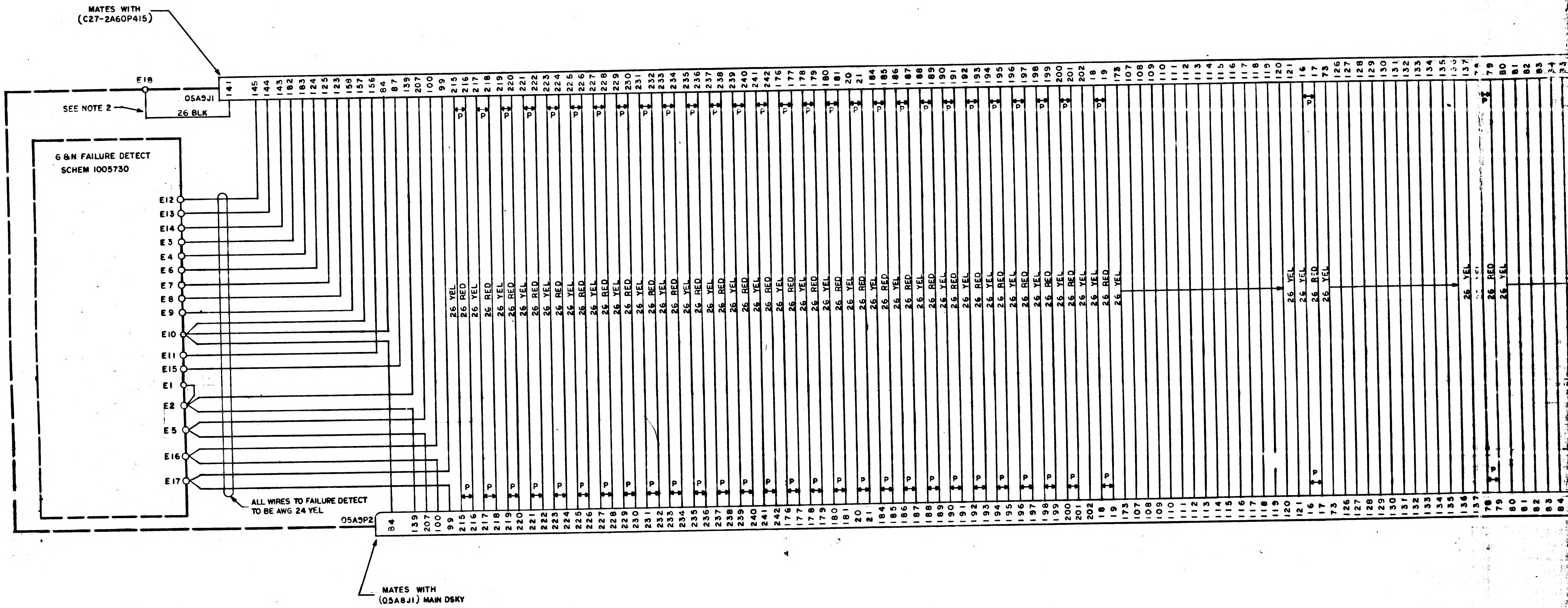
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRING DIAGRAM,
G&N FAILURE DETECT

CODE IDENT NO. 80230 | SIZE J | DRAWING NO. 1006184
SCALE | SHEET 1 OF 1

1006184

MASTER


MATES WITH
(C27-2A60P415)
E18
SEE NOTE 2
05A9J1
26 BLK
6 &N FAILURE DETECT
SCHEM 1005730
E12
E13
E14
E3
E4
E6
E7
E8
E9
E10
E11
E15
E1
E2
E5
E16
E17
ALL WIRES TO FAILURE DETECT
TO BE AWG 24 YEL
05A9P2
26 YEL
26 RED
P
MATES WITH
(05A8J1) MAIN DSKY

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CASE GROUND LEADS SHOULD BE AS SHORT AS POSSIBLE

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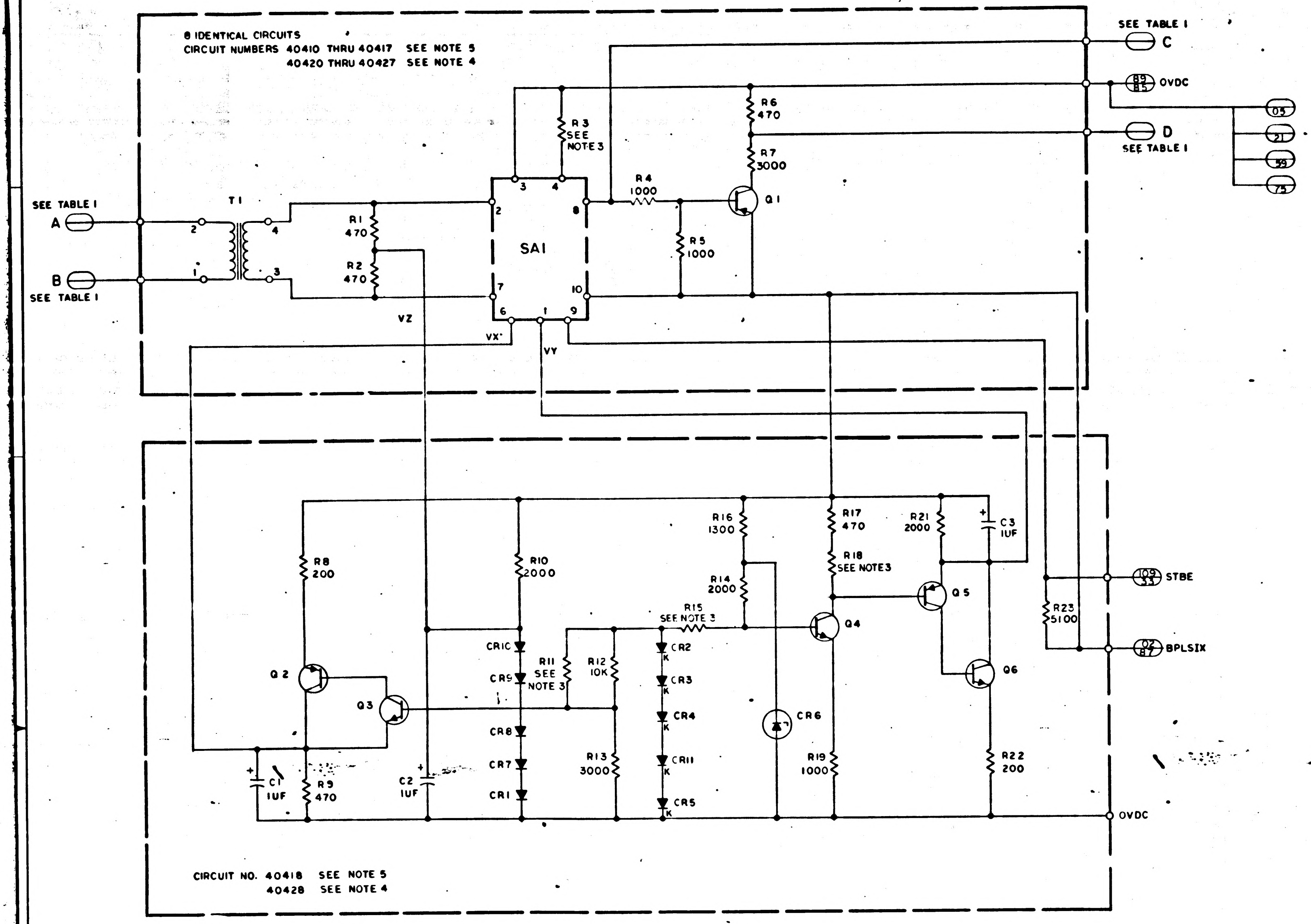
REVISIONS 10859

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 11373 DR CHK	4/13/65	


8 IDENTICAL CIRCUITS
CIRCUIT NUMBERS 40410 THRU 40417 SEE NOTE 5
40420 THRU 40427 SEE NOTE 4
SEE TABLE I
A
B
SEE TABLE I
T1
2
1
4
3
R1
470
R2
470
VZ
SA1
2
3
4
7
6
1
9
10
8
VX
VY
R3
SEE
NOTE 3
R4
1000
R5
1000
R6
470
R7
3000
Q1
SEE TABLE I
C
89
85
OVDC
D
SEE TABLE I
05
21
59
75
R8
200
Q2
Q3
C1
1UF
R9
470
C2
1UF
R10
2000
CR10
CR9
CR8
CR7
CR1
R11
SEE
NOTE 3
R12
10K
R13
3000
R15
SEE NOTE 3
CR2
CR3
CR4
CR11
CR5
K
R16
1300
R14
2000
CR6
R17
470
R18
SEE NOTE 3
Q4
R19
1000
R21
2000
C3
1UF
Q5
Q6
R22
200
R23
5100
109
33
STBE
02
87
BPLSIX
OVDC
CIRCUIT NO. 40418 SEE NOTE 5
40428 SEE NOTE 4

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CKT NO. USED ON	
R1	1006750 -24	RESISTOR	470	2%	1/4 W	40410 THRU 40417 40420 THRU 40427	
R2	-24		470				
R3	-		SEE NOTE 3				
R4	-32		1000				
R5	-32		1000				
R6	-24		470				
R7	-43		3000				
R8	-15		200			40418	40428
R9	-24		470				
R10	-39		2000				
R11	-		SEE NOTE 3				
R12	-56		10K				
R13	-43		3000				
R14	-39		2000				
R15	-		SEE NOTE 3				
R16	-35		1300				
R17	-24		470				
R18	-		SEE NOTE 3				
R19	-32		1000				
~~R20~~	-						
R21	-39		2000				
R22	-15		200				
R23	-49		5100				
C1	1006755-69	CAPACITOR	1 UF		35V		
C2							
C3							
CR1	1006751	DIODE					
CR2							
CR3							
CR4							
CR5							
CR6	1006838						
CR7	1006751						
CR8							
CR9							
CR10							
CR11							
Q1	1006753	TRANSISTOR				40410 THRU 40417	
Q2	1006753					40418 , 40428	
Q3	1006752						
Q4	1006752						
Q5	1006753						
Q6	1006752						
T1	1006762	TRANSFORMER				40410 THRU 40417 40420 THRU 40427	
SA1	1006769	SENSE AMPL					

40420 THRU 40427

R3	
PART NO	VALUE
1006750-15	200
-16	220
-17	240
-18	270
-19	300
-20	330
-21	360
-22	390
-23	430
-24	470
-25	510
-26	560
-27	620
-28	680
-29	750
-30	820
-31	910
-32	1000
-33	1100
-34	1200
-35	1300
-36	1500
-37	1600
-38	1800
-39	2000
-40	2200
-41	2400
-42	2700
-43	3000
-44	3300
-45	3600
-46	3900
-47	4300
-48	4700
1006750-49	5100

TABLE III

R15		R18	
PART NO.	VALUE	PART NO.	VALUE
1006750 - 1	51	1006750-25	510
-2	56	-26	560
-3	62	-27	620
-4	68	-28	680
-5	75	-29	750
-6	82	-30	820
-7	91	-31	910
-8	100	-32	1000
-9	110	-33	1100
-10	120	-34	1200
-11	130	-35	1300
-12	150	-36	1500
-13	160	-37	1600
-14	180	-38	1800
-15	200	-39	2000
-16	220	-40	2200
-17	240	-41	2400
-18	270	-42	2700
-19	300	-43	3000
-20	330	-44	3300
-21	360	-45	3600
-22	390	-46	3900
-23	430	-47	4300
-24	470	-48	4700
1006750 -25	510	1006750-49	5100

TABLE II

R11		R11	
PART NO.	VALUE	PART NO.	VALUE
1006750-15	200	1006750-31	910
-16	220	-32	1000
-17	240	-33	1100
-18	270	-34	1200
-19	300	-35	1300
-20	330	-36	1500
-21	360	-37	1600
-22	390	-38	1800
-23	430	-39	2000
-24	470	-40	2200
-25	510	-41	2400
-26	560	-42	2700
-27	620	-43	3000
-28	680	-44	3300
-29	750	-45	3600
1006750 -30	820	1006750-46	3900

TABLE I

COMPONENT PREFIX NO. (ASSY)	CIRCUIT NO.	A			B			C			D		
		SIGNAL	PIN NO. AGC 4	PIN NO. AGC 5	SIGNAL	PIN NO AGC 4	PIN NO. AGC 5	SIGNAL	PIN NO. AGC 4	PIN NO. AGC 5	SIGNAL	PIN NO. AGC 4	PIN NO. AGC 5
1	40410	SAF01	90	8	SBF01	100	6	40410A	80	2	SA01	110	4
2	40411	SAF02	91	7	SBF02	101	9	40411A	81	13	SA02	111	11
3	40412	SAF03	92	24	SBF03	102	22	40412A	82	18	SA03	112	20
4	40413	SAF04	93	23	SBF04	103	25	40413A	83	29	SA04	113	27
5	40414	SAF05	94	62	SBF05	104	60	40414A	84	54	SA05	114	56
6	40415	SAF06	95	61	SBF06	105	63	40415A	85	67	SA06	115	65
7	40416	SAF07	96	78	SBF07	106	76	40416A	86	70	SA07	116	72
8	40417	SAF08	97	77	SBF08	107	79	40417A	87	83	SA08	117	81
1	40420	SAF09	90	8	SBF09	100	6	40420A	80	2	SA09	110	4
2	40421	SAF10	91	7	SBF10	101	9	40421A	81	13	SA10	111	11
3	40422	SAF11	92	24	SBF11	102	22	40422A	82	18	SA11	112	20
4	40423	SAF12	93	23	SBF12	103	25	40423A	83	29	SA12	113	27
5	40424	SAF13	94	62	SBF13	104	60	40424A	84	54	SA13	114	56
6	40425	SAF14	95	61	SBF14	105	63	40425A	85	67	SA14	115	65
7	40426	SAF15	96	78	SBF15	106	76	40426A	86	70	SA15	116	72
8	40427	SAF16	97	77	SBF16	107	79	40427A	87	83	SA16	117	81

REF DWG 1003463 ERASABLE SENSE AMPL. MODULE ASSY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. UNLESS OTHERWISE SPECIFIED,
   RESISTOR VALUES ARE IN OHMS
   CAPACITOR VALUES ARE IN MICROFARADS
3. THE VALUE OF R3, R11, R15, R18 TO BE DETERMINED BY ELECTRICAL TEST. SEE TABLES II AND III
4. CIRCUIT NO. 40420 THRU 40427 AND 40428 TO BE IN MODULE B14
5. CIRCUIT NO. 40410 THRU 40417 AND 40418 TO BE IN MODULE B13

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

INSTRUMENTATION LAB
DWG NO CONTRACT
DRAWN DATE
CHECKED 2 JUN 64
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC, ERASABLE
SENSE AMPL MODULE B13-B14

CODE IDENT NO. —
SIZE E
NASA DRAWING NO 1006187
SCALE — WT —
SHEET 1 OF 1

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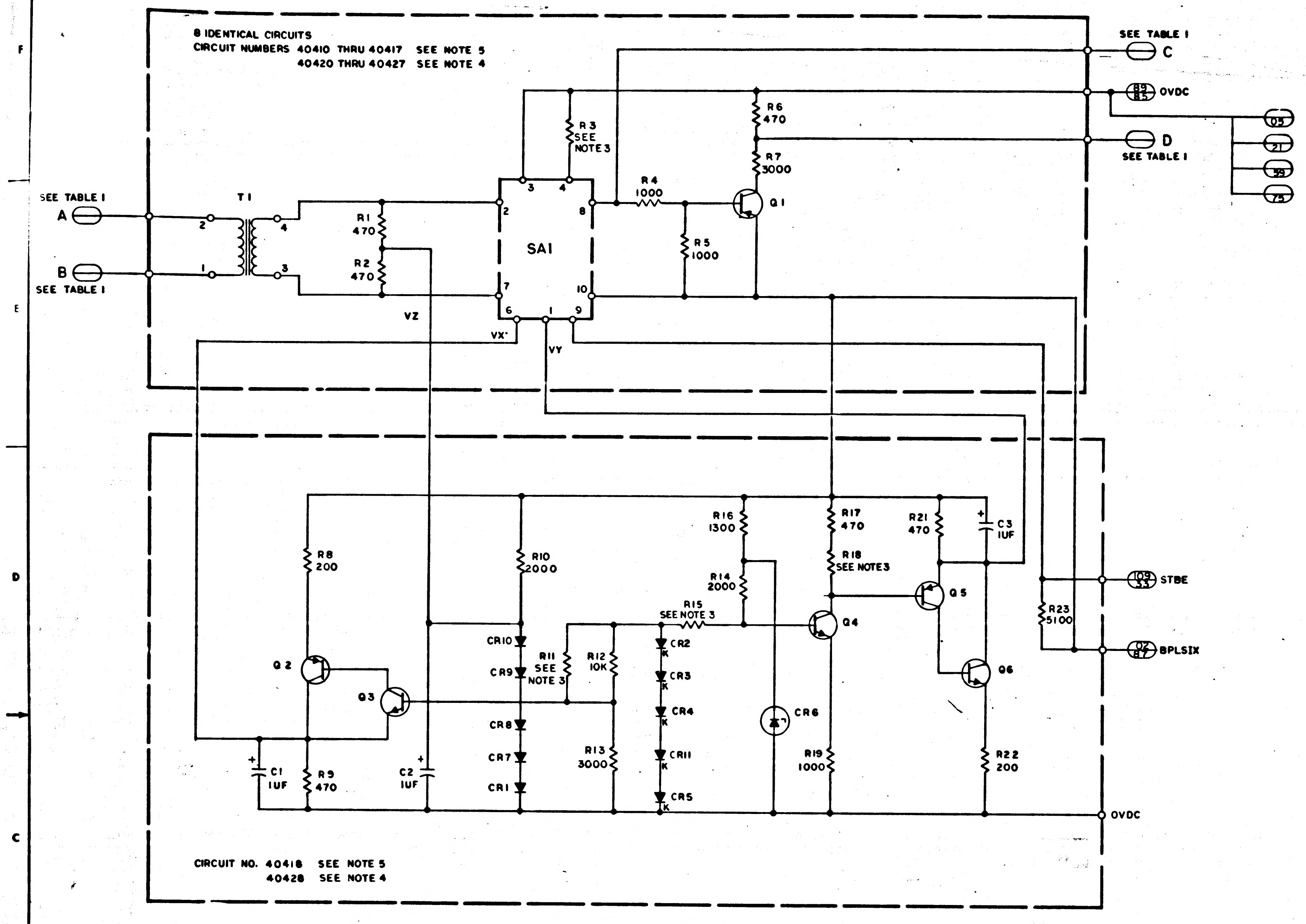
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



8 IDENTICAL CIRCUITS
CIRCUIT NUMBERS 40410 THRU 40417 SEE NOTE 5
40420 THRU 40427 SEE NOTE 4
SEE TABLE I
A
B
SEE TABLE I
T1
1
2
3
4
R1 470
R2 470
VZ
R3 SEE NOTE 3
SA1
2 3 4 7 6 1 9 8 10
VX
VY
R4 1000
R5 1000
R6 470
R7 3000
Q1
SEE TABLE I C
89/85 OVDC
05
21
59
75
D SEE TABLE I
R8 200
R10 2000
R16 1300
R17 470
R21 470
C3 1UF
R14 2000
R18 SEE NOTE 3
R15 SEE NOTE 3
R11 SEE NOTE 3
R12 10K
CR10
CR9
CR2
CR3
CR4
CR11
CR5
CR8
CR7
CR1
Q2
Q3
Q4
Q5
Q6
CR6
R13 3000
R19 1000
R22 200
C1 1UF
R9 470
C2 1UF
109/33 STBE
R23 5100
02/87 BPLSIX
OVDC
CIRCUIT NO. 40418 SEE NOTE 5
40428 SEE NOTE 4

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CKT NO. USED ON	
R1	1006750 -24	RESISTOR	470	2%	1/4 W	40410 THRU 40417 40420 THRU 40427	
R2	-24		470				
R3	-		SEE NOTE 3				
R4	-32		1000				
R5	-32		1000				
R6	-24		470				
R7	-43		3000				
R8	-15		200			40418	40428
R9	-24		470				
R10	-39		2000				
R11	-		SEE NOTE 3				
R12	-56		10K				
R13	-43		3000				
R14	-39		2000				
R15	-		SEE NOTE 3				
R16	-35		1300				
R17	-24		470				
R18	-		SEE NOTE 3				
R19	-32		1000				
~~R20~~	-						
R21	-24		470				
R22	-15		200				
R23	-49		5100				
C1	1006755-69	CAPACITOR	1 UF		35V		
C2							
C3							
CR1	1006751	DIODE					
CR2							
CR3							
CR4							
CR5							
CR6	1006838						
CR7	1006751						
CR8							
CR9							
CR10							
CR11							
Q1	1006753	TRANSISTOR				40410 THRU 40417	
Q2	1006753					40418	40428
Q3	1006752						
Q4	1006752						
Q5	1006753						
Q6	1006752						
T1	1006762	TRANSFORMER				40410 THRU 40417 40420 THRU 40427	
SA1	1006769	SENSE AMPL					

40420 THRU 40427

TABLE II

R11		R11	
PART NO.	VALUE	PART NO.	VALUE
1006750-15	200	1006750-31	910
-16	220	-32	1000
-17	240	-33	1100
-18	270	-34	1200
-19	300	-35	1300
-20	330	-36	1500
-21	360	-37	1600
-22	390	-38	1800
-23	430	-39	2000
-24	470	-40	2200
-25	510	-41	2400
-26	560	-42	2700
-27	620	-43	3000
-28	680	-44	3300
-29	750	-45	3600
1006750-30	820	1006750-46	3900

TABLE I

COMPONENT PREFIX NO. (ASSY)	CIRCUIT NO.	A			B			C			D		
		SIGNAL	PIN NO. AGC 4	PIN NO. AGC 5	SIGNAL	PIN NO AGC 4	PIN NO. AGC 5	SIGNAL	PIN NO. AGC 4	PIN NO. AGC 5	SIGNAL	PIN NO. AGC 4	PIN NO. AGC 5
1	40410	SAF01	90	8	SBF01	100	6	40410A	80	2	SA01	110	4
2	40411	SAF02	91	7	SBF02	101	9	40411A	81	13	SA02	111	11
3	40412	SAF03	92	24	SBF03	102	22	40412A	82	18	SA03	112	20
4	40413	SAF04	93	23	SBF04	103	25	40413A	83	29	SA04	113	27
5	40414	SAF05	94	62	SBF05	104	60	40414A	84	54	SA05	114	56
6	40415	SAF06	95	61	SBF06	105	63	40415A	85	67	SA06	115	65
7	40416	SAF07	96	78	SBF07	106	76	40416A	86	70	SA07	116	72
8	40417	SAF08	97	77	SBF08	107	79	40417A	87	83	SA08	117	81
1	40420	SAF09	90	8	SBF09	100	6	40420A	80	2	SA09	110	4
2	40421	SAF10	91	7	SBF10	101	9	40421A	81	13	SA10	111	11
3	40422	SAF11	92	24	SBF11	102	22	40422A	82	18	SA11	112	20
4	40423	SAF12	93	23	SBF12	103	25	40423A	83	29	SA12	113	27
5	40424	SAF13	94	62	SBF13	104	60	40424A	84	54	SA13	114	56
6	40425	SAF14	95	61	SBF14	105	63	40425A	85	67	SA14	115	65
7	40426	SAF15	96	78	SBF15	106	76	40426A	86	70	SA15	116	72
8	40427	SAF16	97	77	SBF16	107	79	40427A	87	83	SA16	117	81

TABLE III

R3		R15		R18	
PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE
1006750-25	510	1006750-1	51	1006750-32	1000
-26	560	-2	56	-33	1100
-27	620	-3	62	-34	1200
-28	680	-4	68	-35	1300
-29	750	-5	75	-36	1500
-30	820	-6	82	-37	1600
-31	910	-7	91	-38	1800
-32	1000	-8	100	-39	2000
-33	1100	-9	110	-40	2200
-34	1200	-10	120	-41	2400
-35	1300	-11	130	-42	2700
-36	1500	-12	150	-43	3000
-37	1600	-13	160	-44	3300
-38	1800	-14	180	-45	3600
-39	2000	-15	200	-46	3900
-40	2200	-16	220	-47	4300
-41	2400	-17	240	-48	4700
-42	2700	-18	270	1006750-49	5100
-43	3000	-19	300		
-44	3300	-20	330		
-45	3600	-21	360		
-46	3900	-22	390		
-47	4300	-23	430		
-48	4700	-24	470		
1006750-49	5100	1006750-25	510		

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. UNLESS OTHERWISE SPECIFIED,
   RESISTOR VALUES ARE IN OHMS
   CAPACITOR VALUES ARE IN MICROFARADS
3. THE VALUE OF R3, R11, R15, R18 TO BE DETERMINED BY ELECTRICAL TEST. SEE TABLES II AND III
4. CIRCUIT NO. 40420 THRU 40427 AND 40428 TO BE IN MODULE B14
5. CIRCUIT NO. 40410 THRU 40417 AND 40418 TO BE IN MODULE B13

REF DWG 1003463 ERASABLE SENSE AMPL. MODULE ASSY

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC, ERASABLE SENSE AMPL MODULE B13-B14

CODE IDENT NO —
SIZE E
NASA DRAWING NO 1006187
SCALE —
WT —
SHEET 1 OF 1

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

– 6819001

REVISIONS 56''

SYM	DESCRIPTION	DATE	APPROVAL

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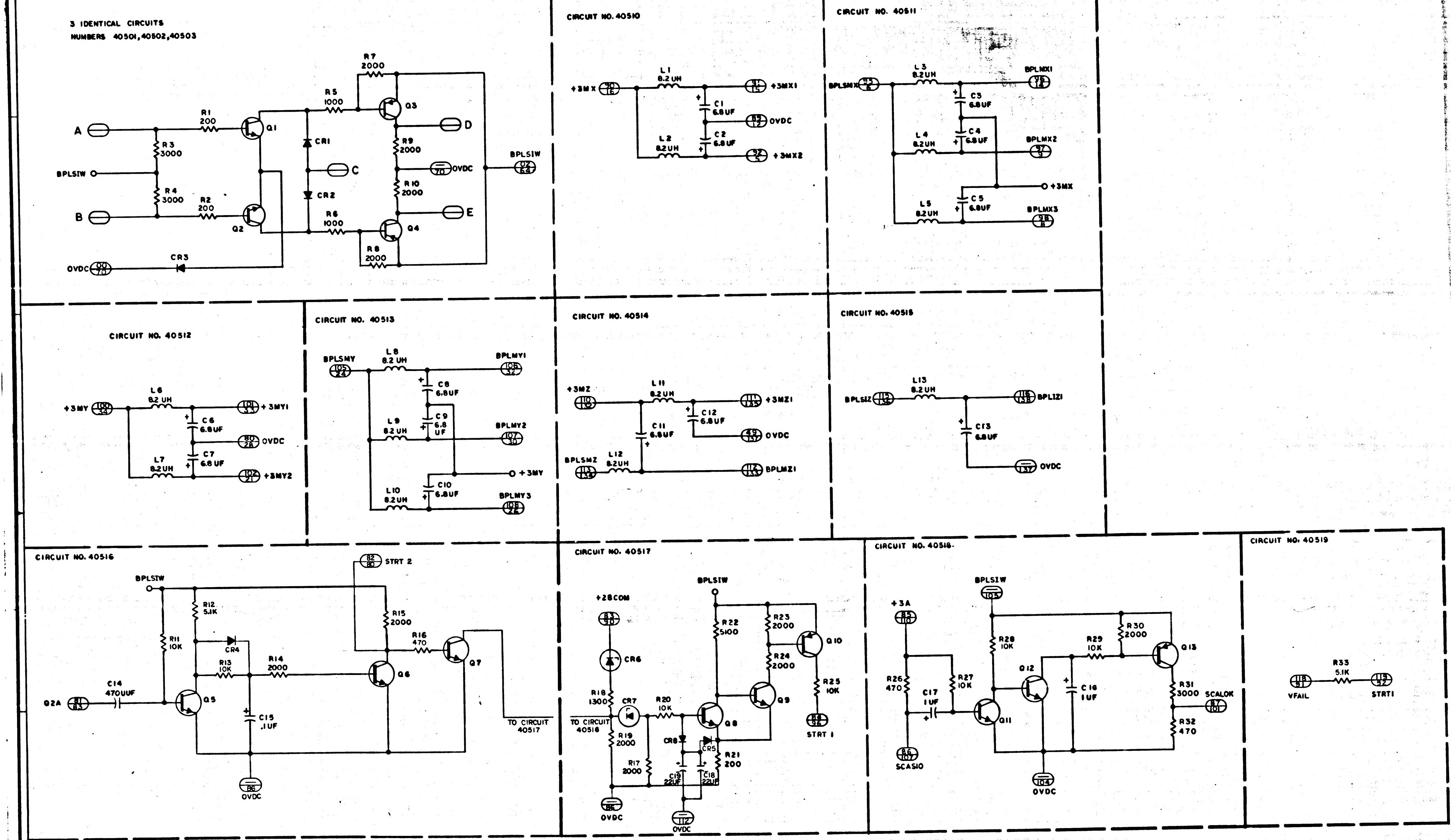
3 IDENTICAL CIRCUITS
NUMBERS 40501,40502,40503
A
B
C
D
E
BPLSIW
R1 200
R2 200
R3 3000
R4 3000
Q1
Q2
CR1
CR2
CR3
OVDC 00 70
R5 1000
R6 1000
R7 2000
R8 2000
R9 2000
R10 2000
Q3
Q4
70 OVDC
BPLSIW 02 64
CIRCUIT NO. 40510
+3MX 90 16
L1 8.2 UH
L2 8.2 UH
C1 6.8 UF
C2 6.8 UF
91 15 +3MX1
89 12 OVDC
92 5 +3MX2
CIRCUIT NO. 40511
BPLSMX 93 6
L3 8.2 UH
L4 8.2 UH
L5 8.2 UH
C3 6.8 UF
C4 6.8 UF
C5 6.8 UF
BPLMX1 96 14
BPLMX2 97 9
+3MX
BPLMX3 98 8
CIRCUIT NO. 40512
+3MY 100 34
L6 8.2 UH
L7 8.2 UH
C6 6.8 UF
C7 6.8 UF
101 33 +3MY1
80 28 OVDC
102 21 +3MY2
CIRCUIT NO. 40513
BPLSMY 105 24
L8 8.2 UH
L9 8.2 UH
L10 8.2 UH
C8 6.8 UF
C9 6.8 UF
C10 6.8 UF
BPLMY1 106 32
BPLMY2 107 30
+3MY
BPLMY3 108 26
CIRCUIT NO. 40514
+3MZ 110 132
L11 8.2 UH
L12 8.2 UH
C11 6.8 UF
C12 6.8 UF
111 135 +3MZ1
49 137 OVDC
BPLSMZ 113 134
112 133 BPLMZ1
CIRCUIT NO. 40515
BPLSIZ 115 136
L13 8.2 UH
C13 6.8 UF
116 138 BPLIZI
137 OVDC
CIRCUIT NO. 40516
BPLSIW
R11 10K
R12 5.1K
CR4
R13 10K
R14 2000
R15 2000
R16 470
82 80 STRT 2
Q2A 81 83
C14 470UUF
C15 .1UF
Q5
Q6
Q7
86 OVDC
TO CIRCUIT 40517
CIRCUIT NO. 40517
+28COM 83 90
CR6
R18 1300
CR7
R19 2000
R17 2000
R20 10K
CR8
CR5
C19 22UF
C18 22UF
R21 200
TO CIRCUIT 40516
BPLSIW
R22 5100
R23 2000
R24 2000
R25 10K
Q8
Q9
Q10
88 96 STRT 1
85 OVDC
112 OVDC
CIRCUIT NO. 40518-
+3A 85 110
R26 470
R27 10K
C17 1 UF
86 107 SCASIO
BPLSIW 105
R28 10K
R29 10K
R30 2000
C16 1 UF
Q11
Q12
Q13
R31 3000
R32 470
SCALOK 87 101
104 OVDC
CIRCUIT NO. 40519
R33 5.1K
118 91 VFAIL
119 92 STRT1

REF ASSEMBLY DWG 1003470

– REPLACES 1006148 AFTER SYSTEM NO. 20 WITH CHANGES

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. UNLESS OTHERWISE SPECIFIED, RESISTOR VALUES ARE IN OHMS

COMPONENT PREFIX (ASSY)	CIRCUIT NO.	A			B			C			D			E		
		SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5
1	40501	RPG1	10	49	RPG4	13	47	GATER	20	53	GTRS	30	57	GTUS	33	55
2	40502	RPG2	11	61	RPG5	14	59	GATES	21	65	GTSS	31	69	GTVS	34	67
3	40503	RPG3	12	73	RPG6	15	71	GATET	22	77	GTTS	32	81	GTWS	35	79

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

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UNLESS OTHERWISE SPECIFIED
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CAMBRIDGE, MASS

DRAWN P. Boudreau DATE 7 Aug 64
CHECKED R. Edwards 10 Aug 64
APPROVAL R. T. Martin 12 Aug
APPROVAL E. J. Duggan 9/4/64
NASA APPROVAL 9/4/64
MIT APPROVAL 9/4/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC,
STRAND GATE MODULE B31

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006189
SCALE —
WT —
SHEET 1 OF 2

INCHES
0 1 2
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–	6819001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
R1	1006750 - 15	RESISTOR	200	± 2%	1/4 W	40501 40502 40503
R2	- 15		200			
R3	- 43		3000			
R4	- 43		3000			
R5	- 32		1000			
R6	- 32		1000			
R7	- 39		2000			
R8	- 39		2000			
R9	- 39		2000			
R10	- 39		2000			
R11	- 56		10K			40516
R12	- 49		5100			
R13	- 56		10K			
R14	- 39		2000			
R15	- 39		2000			
R16	- 24		470			
R17	- 39		2000			40517
R18	- 35		1300			
R19	- 39		2000			
R20	- 56		10K			
R21	- 15		200			
R22	- 49		5100			
R23	- 39		2000			
R24	- 39		2000			
R25	- 56		10K			
R26	- 24		470			40518
R27	- 56		10K			
R28	- 56		10K			
R29	- 56		10K			
R30	- 39		2000			
R31	- 43		3000			
R32	- 24		470			
R33	- 49		5.1K			40519
C1	1006755 - 79	CAPACITOR	6.8UF	±10%	35VDC	40510
C2	-					
C3	-					40511
C4	-					
C5	-					
C6	-					40512
C7	-					
C8	-					40513
C9	-					
C10	-					
C11	-					40514
C12	-					
C13	1006755 - 79		6.8UF		35VDC	40515
C14	1006777 - 20		470UUF		100VDC	40516
C15	1006755 - 57		0.1UF		35VDC	
C16	1006755 - 69		1.0 UF		35VDC	40518
C17	1006755 - 69		1.0 UF		35 VDC	
C18	1006755 -134		22 UF		50VDC	40517
C19	1006755 -134		22 UF		50VDC	

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
L1	1010406 - 7	INDUCTOR	8.2UH			40510
L2						
L3						40511
L4						
L5						
L6						40512
L7						
L8						40513
L9						
L10						
L11						40514
L12						
L13						40515
CR1	1006751	DIODE				40501
CR2						40502
CR3						40503
CR4						40516
CR5	1006751					40517
CR6	1006838					
CR7	1006838					
CR8	1006751					
Q1	1006752	TRANSISTOR				40501 40502 40503
Q2	1006752					
Q3	1006753					
Q4	1006753					
Q5	1006752					40516
Q6						
Q7						
Q8						40517
Q9						
Q10	1006753					
Q11	1006752					40518
Q12	1006752					
Q13	1006753					

(–) REPLACES 1006148 AFTER
SYSTEM NO. 20 WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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CHECKED R. Edwards 10 Aug 64
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APPROVAL
NASA APPROVAL
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HOUSTON, TEXAS

SCHEMATIC,
STRAND GATE MODULE B31

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006189
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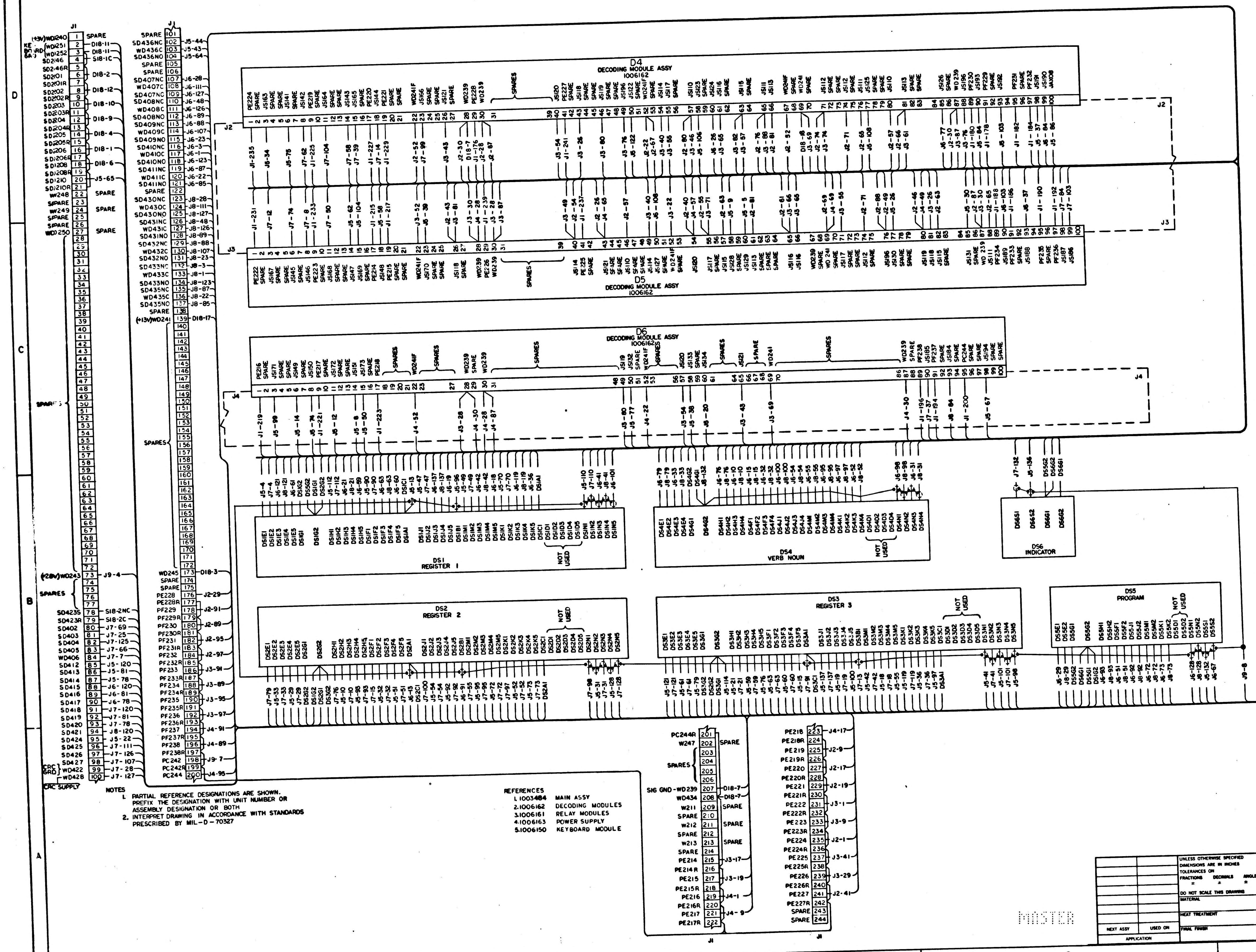
1006189


J1
D4
DECODING MODULE ASSY
1006162
J2
J3
D5
DECODING MODULE ASSY
1006162
D6
DECODING MODULE ASSY
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J4
SPARES
DS1
REGISTER 1
DS4
VERB NOUN
DS6
INDICATOR
DS2
REGISTER 2
DS3
REGISTER 3
DS5
PROGRAM
NOT USED
CRC GRD
CRC SUPPLY
(+13V)WD240
(+13V)WD241
(+28V)WD243
SIG GND-WD239
A

NOTES

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. PREFIX THE DESIGNATION WITH UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REFERENCES

1. 1003484 MAIN ASSY
2. 1006162 DECODING MODULES
3. 1006161 RELAY MODULES
4. 1006163 POWER SUPPLY
5. 1006150 KEYBOARD MODULE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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APPROVAL Bob March 1 Dec 64
APPROVAL Eldon C. Hall 15 Dec 64
NASA APPROVAL
MIT APPROVAL 15 Dec 64

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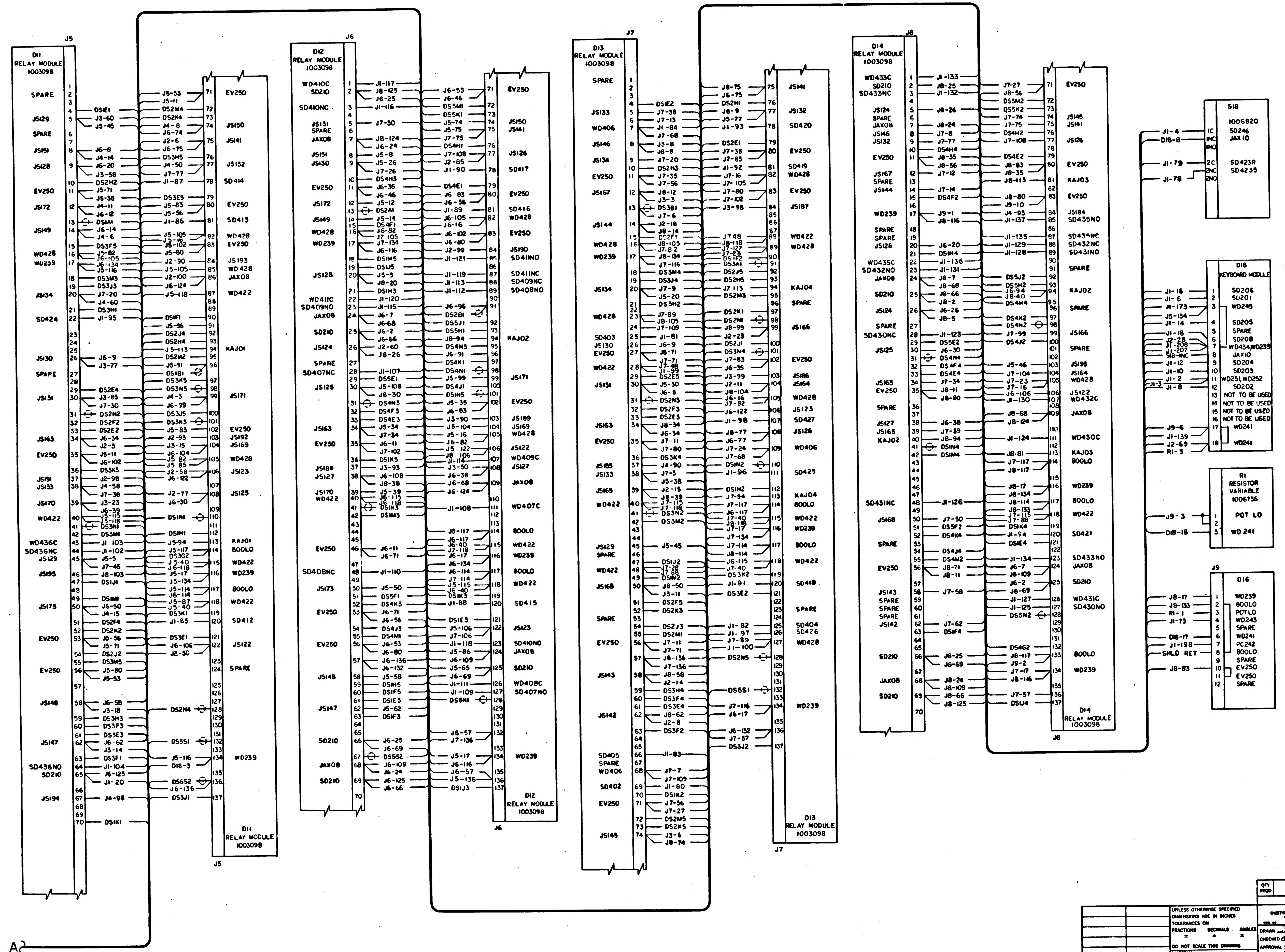
INTERCONNECTION DIAGRAM
AGC DSKY S.D. MAIN

CODE IDENT NO. — SIZE J NASA DRAWING NO. 1006196
SCALE WT SHEET 1 OF 2

1006196

REVISIONS 13224


J5
D11
RELAY MODULE
1003098
J6
D12
RELAY MODULE
1003098
J7
D13
RELAY MODULE
1003098
J8
D14
RELAY MODULE
1003098
S18
1006820
SD246
JAX10
SD423R
SD4235
D18
KEYBOARD MODULE
R1
RESISTOR
VARIABLE
1006736
POT LO
WD 241
J9
D16
A2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY | USED ON
APPLICATION

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INSTRUMENTATION LAB
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DRAWN Bingor DATE 23 Jul 64
CHECKED R. H. Edwards
APPROVAL Ord March 1 Dec 64
APPROVAL Eldon C. Hall 1 Dec 64
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

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INTERCONNECTING DIA M
AGC DSKY S.D. MAIN

CODE IDENT NO. — SIZE J NASA DRAWING NO. 1006196
SCALE — WT SHEET 2 OF 2

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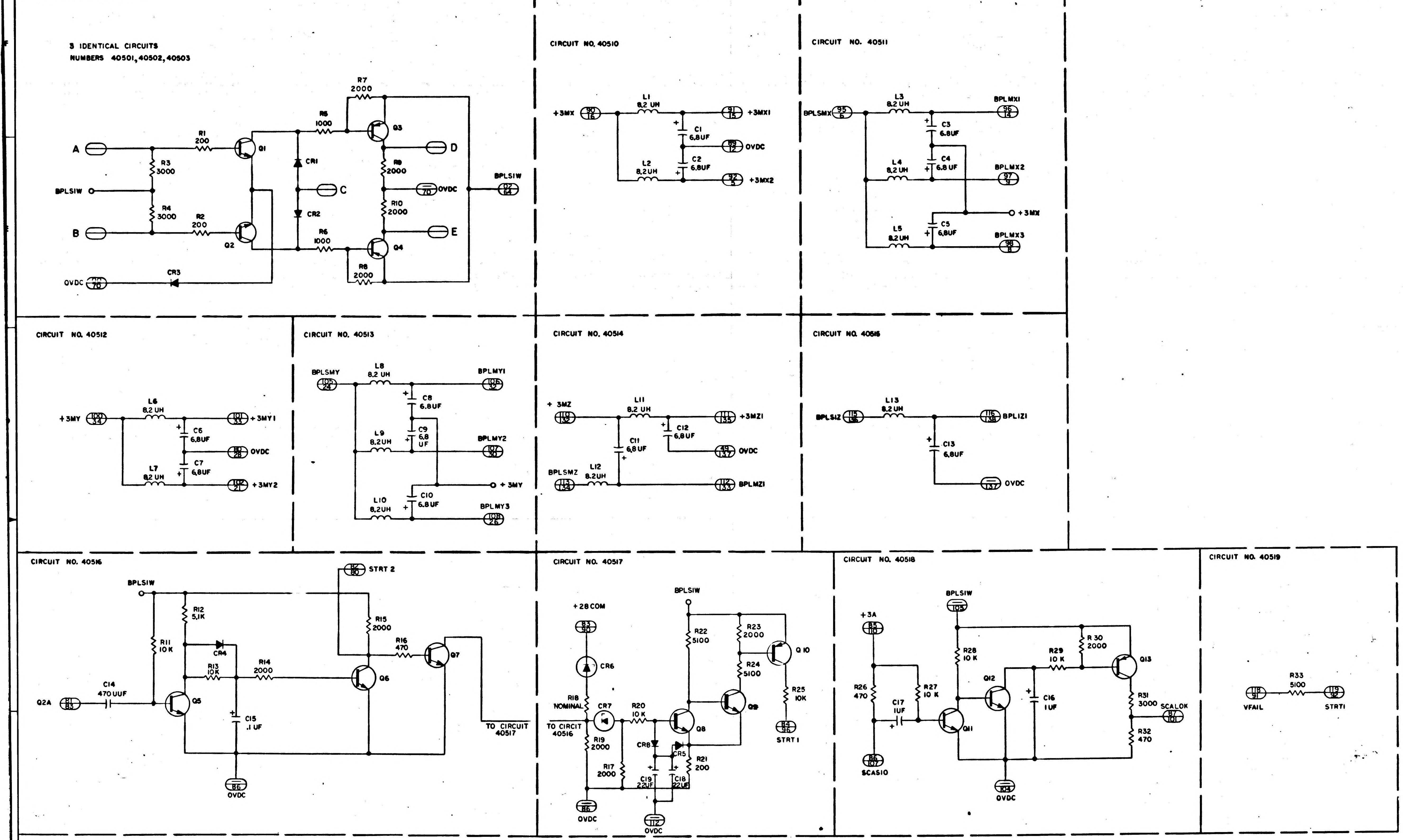
		SYM	DESCRIPTION	DATE	APPROVAL


3 IDENTICAL CIRCUITS
NUMBERS 40501, 40502, 40503
A
B
C
D
E
BPLSIW
OVDC
R1 200
R2 200
R3 3000
R4 3000
R5 1000
R6 1000
R7 2000
R8 2000
R9 2000
R10 2000
Q1
Q2
Q3
Q4
CR1
CR2
CR3
70
70
17 64
CIRCUIT NO. 40510
+3MX
90 16
L1 8.2 UH
L2 8.2 UH
C1 6.8UF
C2 6.8UF
91 15
+3MX1
89 12
OVDC
92 5
+3MX2
CIRCUIT NO. 40511
BPLSMX
95 6
L3 8.2 UH
L4 8.2 UH
L5 8.2 UH
C3 6.8UF
C4 6.8 UF
C5 6.8UF
BPLMX1
96 14
BPLMX2
97 9
+3MX
BPLMX3
98 8
CIRCUIT NO. 40512
+3MY
100 34
L6 8.2 UH
L7 8.2 UH
C6 6.8UF
C7 6.8UF
101 33
+3MY1
OVDC
102 31
+3MY2
CIRCUIT NO. 40513
BPLSMY
105 24
L8 8.2 UH
L9 8.2UH
L10 8.2UH
C8 6.8UF
C9 6.8 UF
C10 6.8 UF
BPLMY1
106 32
BPLMY2
107 30
+3MY
BPLMY3
108 26
CIRCUIT NO. 40514
+3MZ
110 132
L11 8.2 UH
L12 8.2UH
C11 6.8 UF
C12 6.8UF
111 135
+3MZ1
OVDC
BPLSMZ
113 134
112 133
BPLMZ1
CIRCUIT NO. 40515
BPLSIZ
115 136
L13 8.2 UH
C13 6.8UF
116 138
BPLIZ1
137
OVDC
CIRCUIT NO. 40516
BPLSIW
Q2A
81 83
C14 470 UUF
R11 10 K
R12 5.1K
CR4
R13 10K
R14 2000
C15 .1 UF
R15 2000
R16 470
Q5
Q6
Q7
82 80
STRT 2
B6
OVDC
TO CIRCUIT 40517
CIRCUIT NO. 40517
+28 COM
83 90
CR6
R18 NOMINAL
CR7
TO CIRCIT 40516
R19 2000
R17 2000
R20 10 K
CR8
CR5
C19 22UF
C18 22UF
R21 200
BPLSIW
R22 5100
R23 2000
R24 5100
Q8
Q9
Q10
R25 10K
84 96
STRT 1
B6
OVDC
112
OVDC
CIRCUIT NO. 40518
+3A
85 110
R26 470
R27 10 K
C17 1UF
86 107
SCASIO
BPLSIW
105
R28 10 K
Q11
Q12
C16 1UF
R29 10 K
R30 2000
Q13
R31 3000
R32 470
SCALOK
87 101
104
OVDC
CIRCUIT NO. 40519
118 91
VFAIL
R33 5100
119 92
STRT1

REF ASSEMBLY DWG 1003485

— REPLACES 1006189 WITH CHANGES

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. UNLESS OTHERWISE SPECIFIED, RESISTOR VALUES ARE IN OHMS

COMPONENT PREFIX (ASSY)	CIRCUIT NO.	A			B			C			D			E		
		SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5
1	40501	RPG1	10	49	RPG4	13	47	GATER	20	53	GTRS	30	57	GTUS	33	55
2	40502	RPG2	11	61	RPG5	14	59	GATES	21	65	GTSS	31	69	GTVS	34	67
3	40503	RPG3	12	73	RPG6	15	71	GATET	22	77	GTTS	32	81	GTWS	35	79

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG. NO. CONTRACT
DRAWN Paul White DATE 2 DEC 64
CHECKED A. Vorce 5 Jan 65
APPROVAL 7 Jan 65
APPROVAL C. C. Hill 13 Jan 65
NASA APPROVAL W. J. 1-13-65
MIT APPROVAL 13 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC, STRAND GATE MODULE B31

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006199
SCALE —
WT —
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

−	6619001

REVISIONS 13677			
SYM	DESCRIPTION	DATE	APPROVAL

REF DES	PART NO	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
R1	1006750 - 15	RESISTOR	200	± 2%	1/4 W	40501 40502 40503
R2	↑ - 15	↑	200	↑	↑	
R3	- 43		3000			
R4	- 43		3000			
R5	- 32		1000			
R6	- 32		1000			
R7	- 39		2000			
R8	- 39		2000			
R9	- 39		2000			
R10	- 39		2000			
R11	- 56		10K			40516
R12	- 49		5100			
R13	- 56		10K			
R14	- 39		2000			
R15	- 39		2000			
R16	↓ - 24		470			
R17	1006750 - 39		2000			40517
R18	SEE CHART		NOMINAL			
R19	1006750 - 39		2000			
R20	↑ - 56		10K			
R21	- 15		200			
R22	- 49		5100			
R23	- 39		2000			
R24	- 49		5100			
R25	- 56		10K			
R26	- 24		470			40518
R27	- 56		10K			
R28	- 56		10K			
R29	- 56		10K			
R30	- 39		2000			
R31	- 43		3000			
R32	↓ - 24	↓	470	↓	↓	
R33	1006750 - 49	RESISTOR	5100	± 2%	1/4 W	40519
C1	1006755 - 79	CAPACITOR	6.8UF	±10 %	35VDC	40510
C2	↑ - ↑	↑	↑	↑	↑	
C3	-					40511
C4	-					
C5	-					
C6	-					40512
C7	-					
C8	-					40513
C9	-					
C10	-					
C11	-					40514
C12	↓ - ↓		↓		↓	
C13	1006755 - 79		6.8UF		35VDC	40515
C14	1006777 - 20		470UUF		100VDC	40516
C15	1006755 - 57		0.1 UF		35VDC	
C16	1006755 - 69		1.0 UF		35VDC	40518
C17	1006755 - 69		1.0 UF		35VDC	
C18	1006755 -134	↓	22 UF	↓	50VDC	40517
C19	1006755 -134	CAPACITOR	22 UF	±10%	50VDC	

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
L1	1010406 − 7	INDUCTOR	8.2 UH			40510
L2	↑	↑	↑			
L3						40511
L4						
L5						
L6						40512
L7						
L8						40513
L9						
L10						
L11						40514
L12	↓	↓	↓			
L13	1010406 − 7	INDUCTOR	8.2 UH			40515
CR1	1006751	DIODE				40501 40502 40503
CR2	↑	↑				
CR3						
CR4	↓					40516
CR5	1006751					40517
CR6	1006838					
CR7	1006838	↓				
CR8	1006751	DIODE				
Q1	1006752	TRANSISTOR				40501 40502 40503
Q2	1006752	↑				
Q3	1006753					
Q4	1006753					
Q5	1006752					40516
Q6	↑					
Q7						
Q8	↓					40517
Q9	1006752					
Q10	1006753					
Q11	1006752					40518
Q12	1006752	↓				
Q13	1006753	TRANSISTOR				

R18	
DASH NO.	OHMS ±2%
1006750 −116	1050
↑ − 33	1100
−117	1150
− 34	1200
−118	1250
− 35	1300
−119	1400
↓ −36	1500
1006750 − 37	1600

1006199

(−) REPLACES 1006189 WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO — CONTRACT
DRAWN Paul Schlicht DATE 3 DEC 64
CHECKED A. Vorce 5 Jan 65
APPROVAL 7 Jan 65
APPROVAL 13 Jan 65
NASA APPROVAL W J Rhine 1-13-65
MIT APPROVAL 13 Jan 65

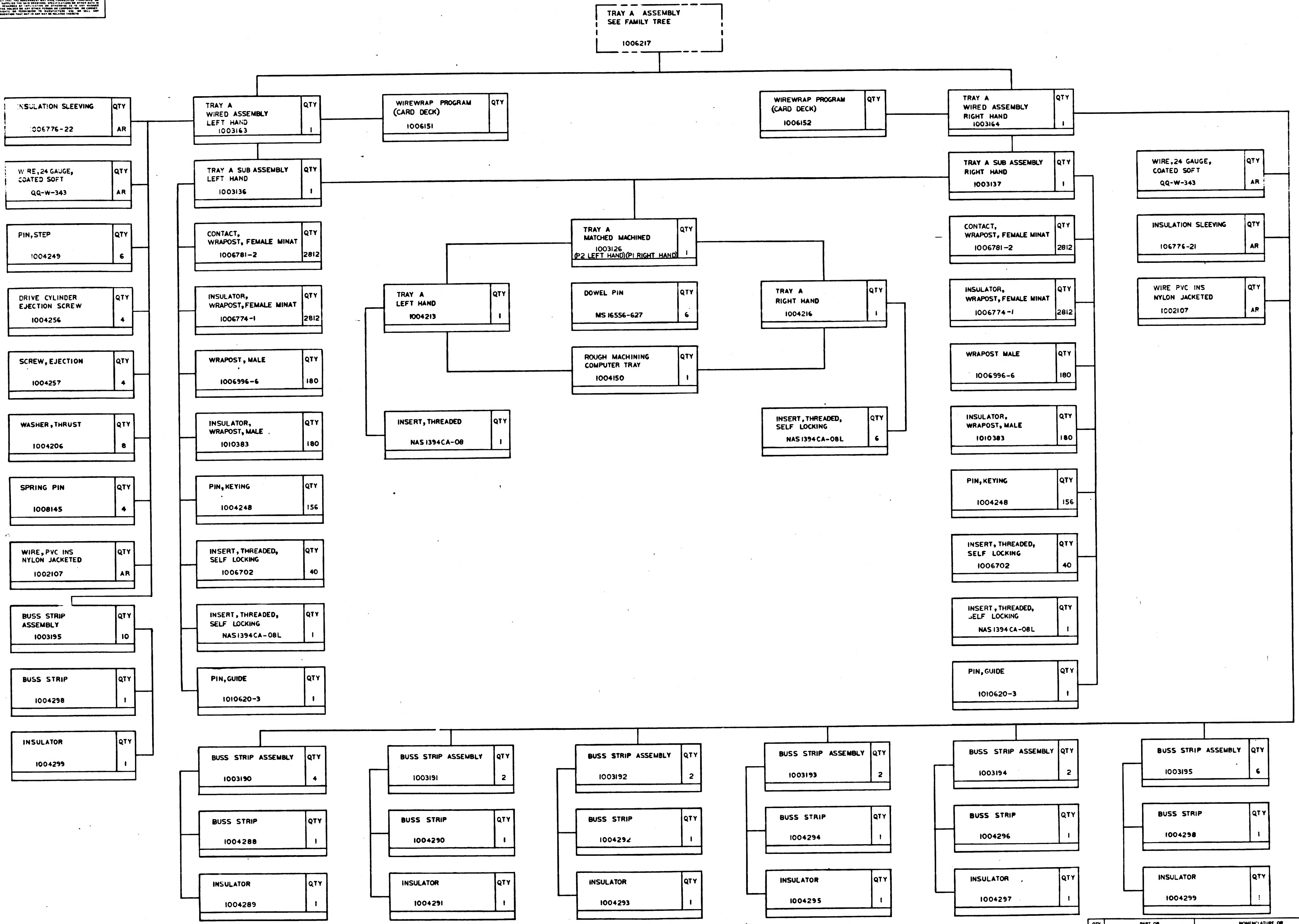
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC,
STRAND GATE MODULE B31

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	E	1006199
SCALE —	WT —	SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS 05175			
SYM	DESCRIPTION	DATE	APPROVAL


TRAY A ASSEMBLY SEE FAMILY TREE 1006217
INSULATION SLEEVING QTY 1006776-22 AR
WIRE, 24 GAUGE, COATED SOFT QTY QQ-W-343 AR
PIN, STEP QTY 1004249 6
DRIVE CYLINDER EJECTION SCREW QTY 1004256 4
SCREW, EJECTION QTY 1004257 4
WASHER, THRUST QTY 1004206 8
SPRING PIN QTY 1008145 4
WIRE, PVC INS NYLON JACKETED QTY 1002107 AR
BUSS STRIP ASSEMBLY QTY 1003195 10
BUSS STRIP QTY 1004298 1
INSULATOR QTY 1004299 1
TRAY A WIRED ASSEMBLY LEFT HAND QTY 1003163 1
TRAY A SUB ASSEMBLY LEFT HAND QTY 1003136 1
CONTACT, WRAPOST, FEMALE MINAT QTY 1006781-2 2812
INSULATOR, WRAPOST, FEMALE MINAT QTY 1006774-1 2812
WRAPOST, MALE QTY 1006996-6 180
INSULATOR, WRAPOST, MALE QTY 1010383 180
PIN, KEYING QTY 1004248 156
INSERT, THREADED, SELF LOCKING QTY 1006702 40
INSERT, THREADED, SELF LOCKING QTY NAS1394CA-08L 1
PIN, GUIDE QTY 1010620-3 1
WIREWRAP PROGRAM (CARD DECK) QTY 1006151
TRAY A MATCHED MACHINED QTY 1003126 (P2 LEFT HAND)(P1 RIGHT HAND) 1
TRAY A LEFT HAND QTY 1004213 1
DOWEL PIN QTY MS16556-627 6
TRAY A RIGHT HAND QTY 1004216 1
ROUGH MACHINING COMPUTER TRAY QTY 1004150 1
INSERT, THREADED QTY NAS1394CA-08 1
INSERT, THREADED, SELF LOCKING QTY NAS1394CA-08L 6
WIREWRAP PROGRAM (CARD DECK) QTY 1006152
TRAY A WIRED ASSEMBLY RIGHT HAND QTY 1003164 1
TRAY A SUB ASSEMBLY RIGHT HAND QTY 1003137 1
CONTACT, WRAPOST, FEMALE MINAT QTY 1006781-2 2812
INSULATOR, WRAPOST, FEMALE MINAT QTY 1006774-1 2812
WRAPOST MALE QTY 1006996-6 180
INSULATOR, WRAPOST, MALE QTY 1010383 180
PIN, KEYING QTY 1004248 156
INSERT, THREADED, SELF LOCKING QTY 1006702 40
INSERT, THREADED, SELF LOCKING QTY NAS1394CA-08L 1
PIN, GUIDE QTY 1010620-3 1
WIRE, 24 GAUGE, COATED SOFT QTY QQ-W-343 AR
INSULATION SLEEVING QTY 1006776-21 AR
WIRE PVC INS NYLON JACKETED QTY 1002107 AR
BUSS STRIP ASSEMBLY QTY 1003190 4
BUSS STRIP QTY 1004288 1
INSULATOR QTY 1004289 1
BUSS STRIP ASSEMBLY QTY 1003191 2
BUSS STRIP QTY 1004290 1
INSULATOR QTY 1004291 1
BUSS STRIP ASSEMBLY QTY 1003192 2
BUSS STRIP QTY 1004292 1
INSULATOR QTY 1004293 1
BUSS STRIP ASSEMBLY QTY 1003193 2
BUSS STRIP QTY 1004294 1
INSULATOR QTY 1004295 1
BUSS STRIP ASSEMBLY QTY 1003194 2
BUSS STRIP QTY 1004296 1
INSULATOR QTY 1004297 1
BUSS STRIP ASSEMBLY QTY 1003195 6
BUSS STRIP QTY 1004298 1
INSULATOR QTY 1004299 1

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 05175 DATE 12/17/63

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN J.F. Webb DATE 12/14/63
CHECKED
APPROVAL
APPROVAL E. J. Duggan 12-16-63
NASA APPROVAL 12/17/63
MIT APPROVAL 12/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

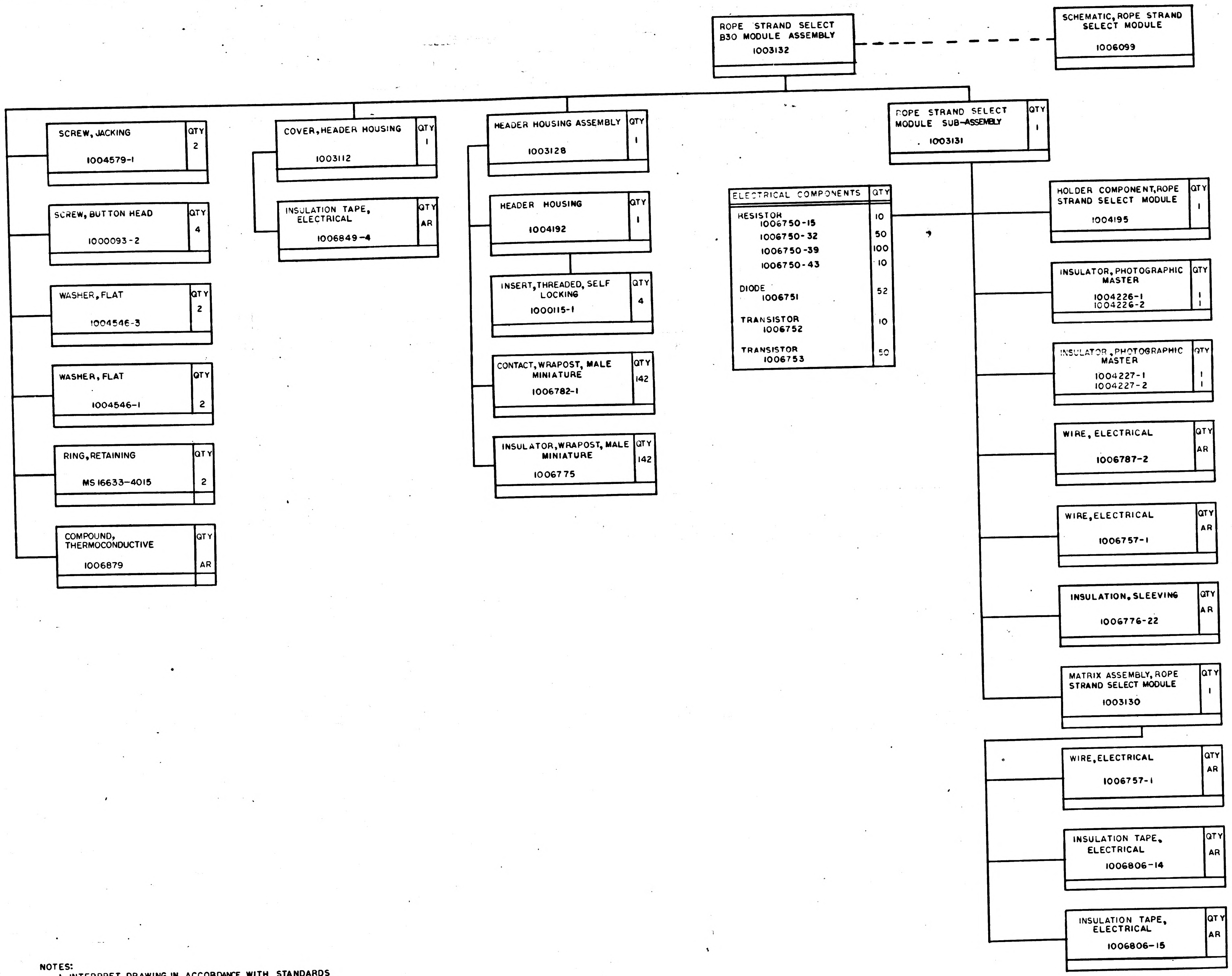
TRAY A
WIRED ASSEMBLY
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006201
SCALE
WT
SHEET 1 OF 1

[illegible]

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 05109	12-10-63	

REVISIONS 03623



ROPE STRAND SELECT B30 MODULE ASSEMBLY 1003132
SCHEMATIC, ROPE STRAND SELECT MODULE 1006099
SCREW, JACKING 1004579-1 QTY 2
SCREW, BUTTON HEAD 1000093-2 QTY 4
WASHER, FLAT 1004546-3 QTY 2
WASHER, FLAT 1004546-1 QTY 2
RING, RETAINING MS 16633-4015 QTY 2
COMPOUND, THERMOCONDUCTIVE 1006879 QTY AR
COVER, HEADER HOUSING 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER HOUSING ASSEMBLY 1003128 QTY 1
HEADER HOUSING 1004192 QTY 1
INSERT, THREADED, SELF LOCKING 1000115-1 QTY 4
CONTACT, WRAPOST, MALE MINIATURE 1006782-1 QTY 142
INSULATOR, WRAPOST, MALE MINIATURE 1006775 QTY 142
ROPE STRAND SELECT MODULE SUB-ASSEMBLY 1003131 QTY 1
ELECTRICAL COMPONENTS QTY
RESISTOR 1006750-15 10
1006750-32 50
1006750-39 100
1006750-43 10
DIODE 1006751 52
TRANSISTOR 1006752 10
TRANSISTOR 1006753 50
HOLDER COMPONENT, ROPE STRAND SELECT MODULE 1004195 QTY 1
INSULATOR, PHOTOGRAPHIC MASTER 1004226-1 1004226-2 QTY 1 1
INSULATOR, PHOTOGRAPHIC MASTER 1004227-1 1004227-2 QTY 1 1
WIRE, ELECTRICAL 1006787-2 QTY AR
WIRE, ELECTRICAL 1006757-1 QTY AR
INSULATION, SLEEVING 1006776-22 QTY AR
MATRIX ASSEMBLY, ROPE STRAND SELECT MODULE 1003130 QTY 1
WIRE, ELECTRICAL 1006757-1 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-14 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-15 QTY AR

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 30-8-63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE
CHECKED C.A. Buta 9-30-63
APPROVAL
APPROVAL
NASA APPROVAL W.J. Rhine 10-2-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE STRAND SELECT
B30 MODULE
FAMILY TREE

CODE IDENT NO. — SIZE E NASA DRAWING NO. 1006202
SCALE WT SHEET 1 OF 1

1006202 A

INCHES
PHOTOGRAPHIC SCALE ONLY

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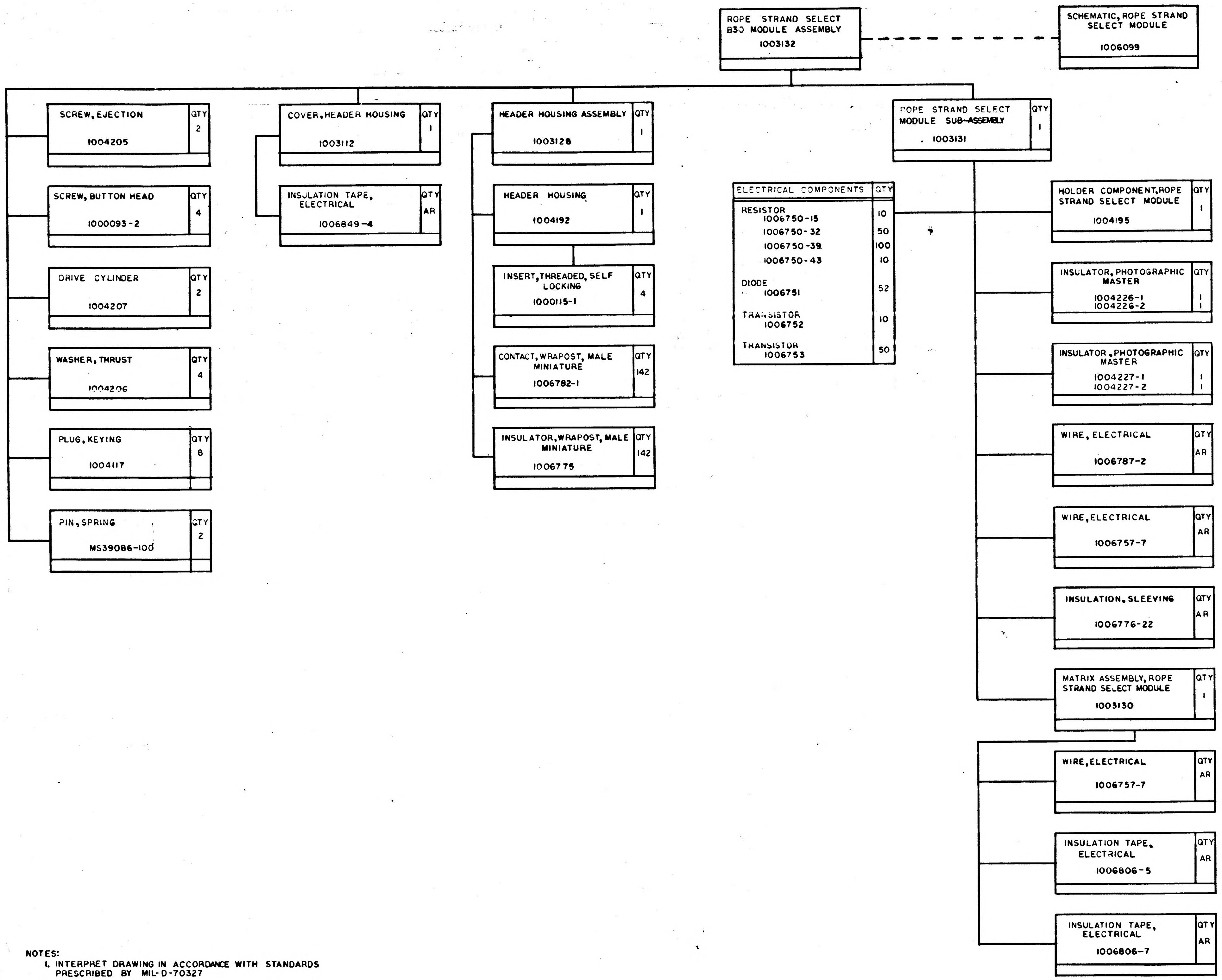
REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL


ROPE STRAND SELECT B30 MODULE ASSEMBLY 1003132
SCHEMATIC, ROPE STRAND SELECT MODULE 1006099
SCREW, EJECTION 1004205 QTY 2
SCREW, BUTTON HEAD 1000093-2 QTY 4
DRIVE CYLINDER 1004207 QTY 2
WASHER, THRUST 1004206 QTY 4
PLUG, KEYING 1004117 QTY 8
PIN, SPRING MS39086-100 QTY 2
COVER, HEADER HOUSING 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER HOUSING ASSEMBLY 1003128 QTY 1
HEADER HOUSING 1004192 QTY 1
INSERT, THREADED, SELF LOCKING 1000115-1 QTY 4
CONTACT, WRAPOST, MALE MINIATURE 1006782-1 QTY 142
INSULATOR, WRAPOST, MALE MINIATURE 1006775 QTY 142
ROPE STRAND SELECT MODULE SUB-ASSEMBLY 1003131 QTY 1
ELECTRICAL COMPONENTS QTY
RESISTOR 1006750-15 10
1006750-32 50
1006750-39 100
1006750-43 10
DIODE 1006751 52
TRANSISTOR 1006752 10
TRANSISTOR 1006753 50
HOLDER COMPONENT, ROPE STRAND SELECT MODULE 1004195 QTY 1
INSULATOR, PHOTOGRAPHIC MASTER 1004226-1 1004226-2 QTY 1 1
INSULATOR, PHOTOGRAPHIC MASTER 1004227-1 1004227-2 QTY 1 1
WIRE, ELECTRICAL 1006787-2 QTY AR
WIRE, ELECTRICAL 1006757-7 QTY AR
INSULATION, SLEEVING 1006776-22 QTY AR
MATRIX ASSEMBLY, ROPE STRAND SELECT MODULE 1003130 QTY 1
WIRE, ELECTRICAL 1006757-7 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-5 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-7 QTY AR

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 30 Oct 63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN DATE
CHECKED C. A. Bester 9-30-63
APPROVAL
APPROVAL
NASA APPROVAL W. J. Rhine 10-2-63
MIT APPROVAL 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE STRAND SELECT
B30 MODULE
FAMILY TREE

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	E	1006202
SCALE	WT	SHEET 1 OF 1

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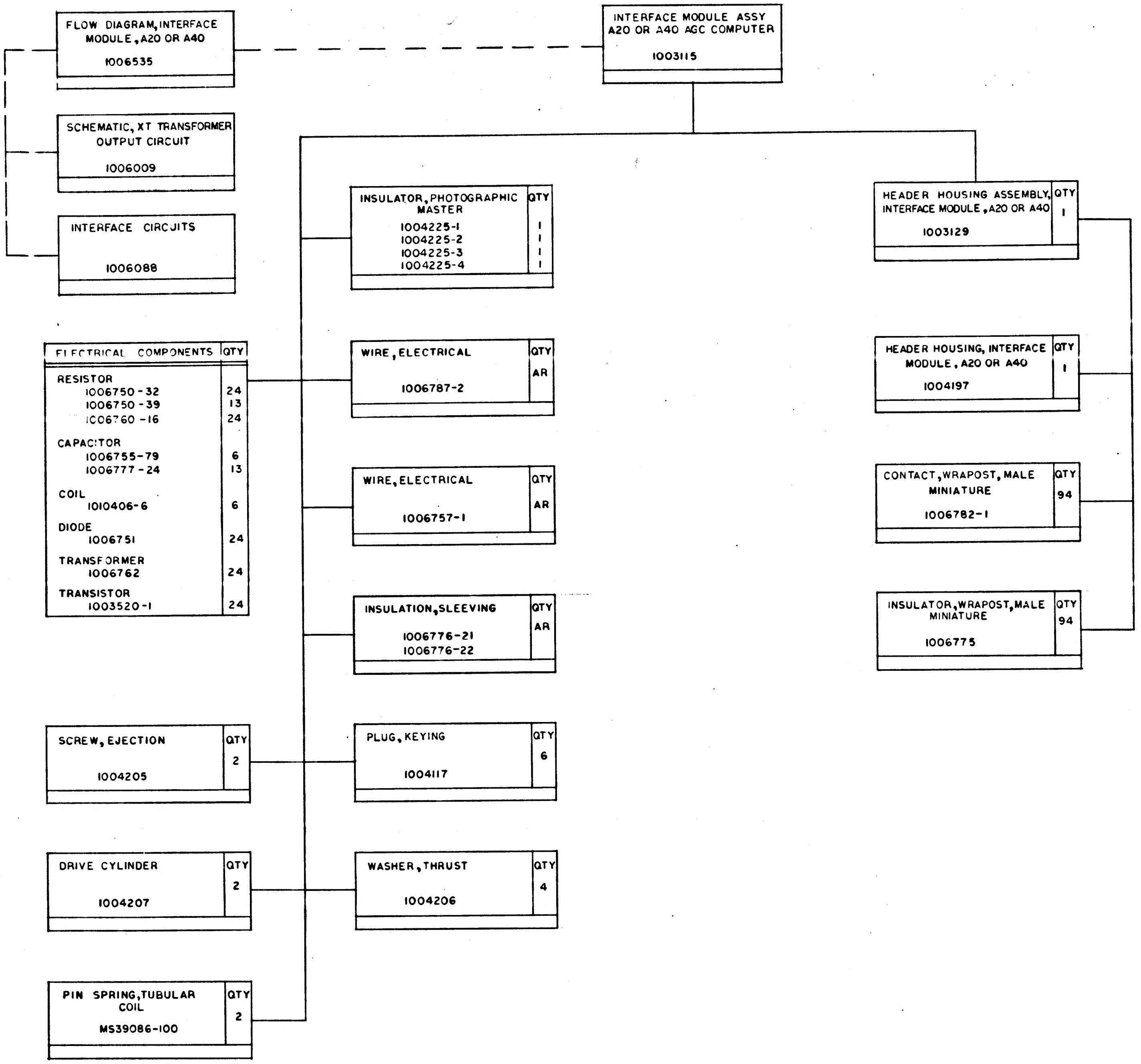
REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL



FLOW DIAGRAM, INTERFACE MODULE, A20 OR A40
1006535
SCHEMATIC, XT TRANSFORMER OUTPUT CIRCUIT
1006009
INTERFACE CIRCUITS
1006088
INTERFACE MODULE ASSY A20 OR A40 AGC COMPUTER
1003115
INSULATOR, PHOTOGRAPHIC MASTER
QTY
1004225-1 1
1004225-2 1
1004225-3 1
1004225-4 1
ELECTRICAL COMPONENTS
QTY
RESISTOR
1006750-32 24
1006750-39 13
1006760-16 24
CAPACITOR
1006755-79 6
1006777-24 13
COIL
1010406-6 6
DIODE
1006751 24
TRANSFORMER
1006762 24
TRANSISTOR
1003520-1 24
WIRE, ELECTRICAL
QTY AR
1006787-2
WIRE, ELECTRICAL
QTY AR
1006757-1
INSULATION, SLEEVING
QTY AR
1006776-21
1006776-22
SCREW, EJECTION
QTY 2
1004205
PLUG, KEYING
QTY 6
1004117
DRIVE CYLINDER
QTY 2
1004207
WASHER, THRUST
QTY 4
1004206
PIN SPRING, TUBULAR COIL
QTY 2
MS39086-100
HEADER HOUSING ASSEMBLY, INTERFACE MODULE, A20 OR A40
QTY 1
1003129
HEADER HOUSING, INTERFACE MODULE, A20 OR A40
QTY 1
1004197
CONTACT, WRAPOST, MALE MINIATURE
QTY 94
1006782-1
INSULATOR, WRAPOST, MALE MINIATURE
QTY 94
1006775

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 30863

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN DATE
CHECKED 9/27/63
APPROVAL
APPROVAL
NASA APPROVAL W J Rhine 10-2-63
MIT APPROVAL 30863

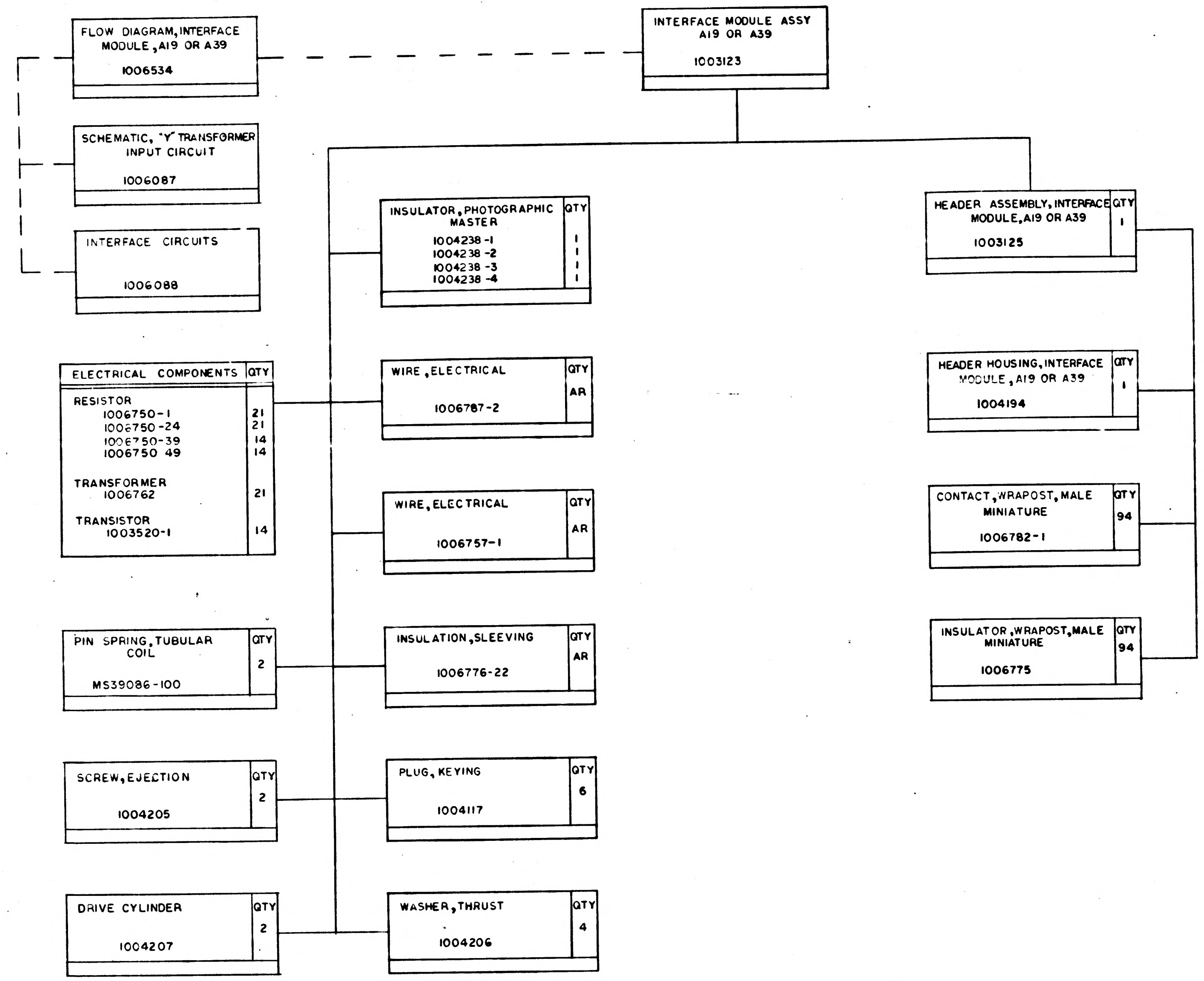
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INTERFACE MODULE
A20 OR A40
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006203
SCALE
WT
SHEET 1 OF 1

1006203

SYM	REVISIONS 03623 DESCRIPTION	DATE	APPROVAL


INTERFACE MODULE ASSY A19 OR A39 1003123
FLOW DIAGRAM, INTERFACE MODULE, A19 OR A39 1006534
SCHEMATIC, "Y" TRANSFORMER INPUT CIRCUIT 1006087
INTERFACE CIRCUITS 1006088
ELECTRICAL COMPONENTS QTY
RESISTOR
1006750-1 21
1006750-24 21
1006750-39 14
1006750 49 14
TRANSFORMER 1006762 21
TRANSISTOR 1003520-1 14
PIN SPRING, TUBULAR COIL MS39086-100 QTY 2
SCREW, EJECTION 1004205 QTY 2
DRIVE CYLINDER 1004207 QTY 2
INSULATOR, PHOTOGRAPHIC MASTER QTY
1004238-1 1
1004238-2 1
1004238-3 1
1004238-4 1
WIRE, ELECTRICAL 1006787-2 QTY AR
WIRE, ELECTRICAL 1006757-1 QTY AR
INSULATION, SLEEVING 1006776-22 QTY AR
PLUG, KEYING 1004117 QTY 6
WASHER, THRUST 1004206 QTY 4
HEADER ASSEMBLY, INTERFACE MODULE, A19 OR A39 1003125 QTY 1
HEADER HOUSING, INTERFACE MODULE, A19 OR A39 1004194 QTY 1
CONTACT, WRAPOST, MALE MINIATURE 1006782-1 QTY 94
INSULATOR, WRAPOST, MALE MINIATURE 1006775 QTY 94

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 30Oct63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

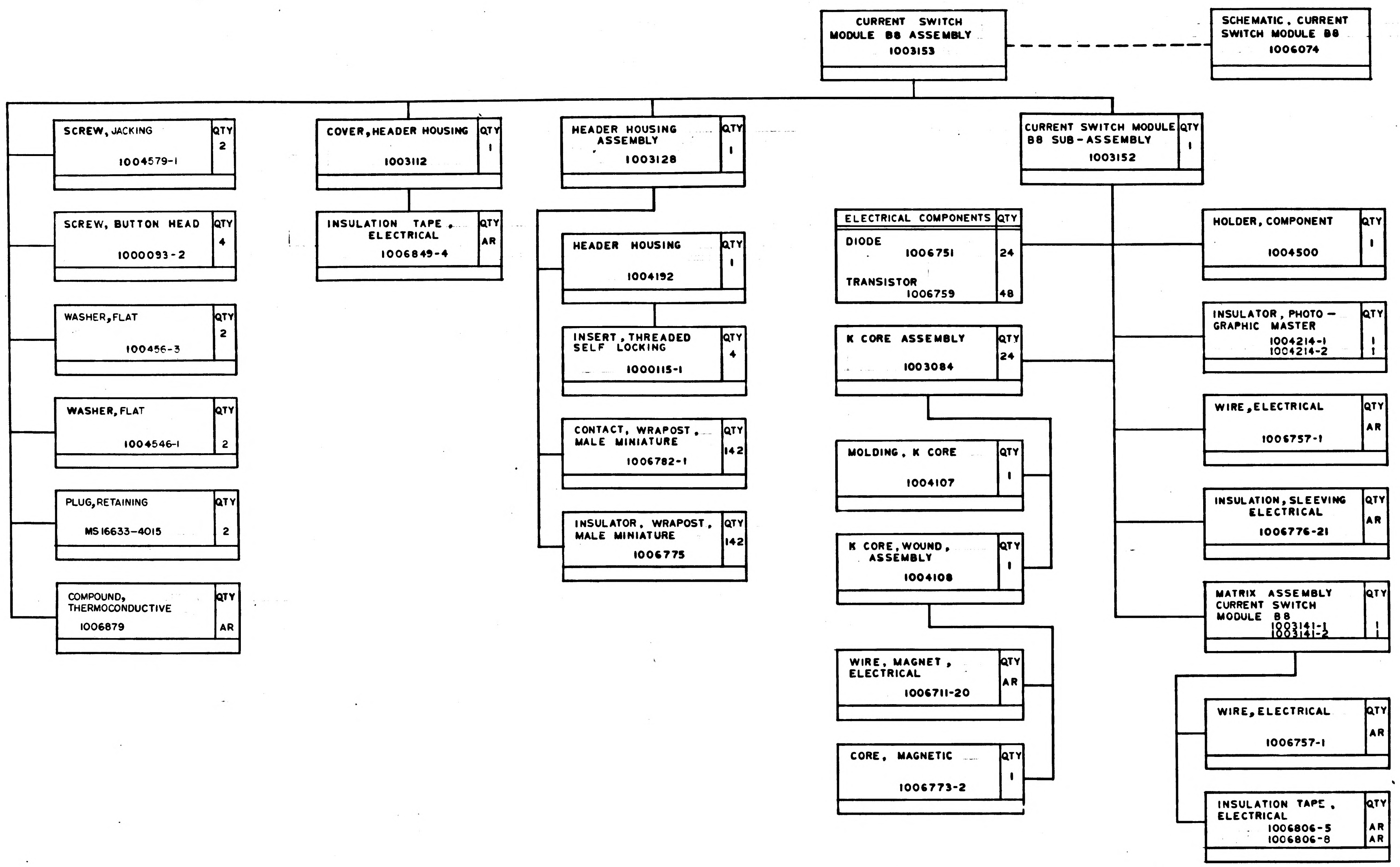
M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN [illegible] DATE [illegible]
CHECKED E. Bushar 9/3/63
APPROVAL
APPROVAL J Duggan 10/2/63
NASA APPROVAL W J Rhine 10-2-63
MIT APPROVAL W Hoag 30Oct63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INTERFACE MODULE
A19 OR A39
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006204
SCALE
WT
SHEET 1 OF 1

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS 03623			
A	REVISED PER TDRR 05109	2-10-63	



CURRENT SWITCH MODULE B8 ASSEMBLY 1003153
SCHEMATIC, CURRENT SWITCH MODULE B8 1006074
SCREW, JACKING 1004579-1 QTY 2
SCREW, BUTTON HEAD 1000093-2 QTY 4
WASHER, FLAT 100456-3 QTY 2
WASHER, FLAT 1004546-1 QTY 2
PLUG, RETAINING MS16633-4015 QTY 2
COMPOUND, THERMOCONDUCTIVE 1006879 QTY AR
COVER, HEADER HOUSING 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER HOUSING ASSEMBLY 1003128 QTY 1
HEADER HOUSING 1004192 QTY 1
INSERT, THREADED SELF LOCKING 1000115-1 QTY 4
CONTACT, WRAPOST, MALE MINIATURE 1006782-1 QTY 142
INSULATOR, WRAPOST, MALE MINIATURE 1006775 QTY 142
CURRENT SWITCH MODULE B8 SUB-ASSEMBLY 1003152 QTY 1
ELECTRICAL COMPONENTS QTY
DIODE 1006751 24
TRANSISTOR 1006759 48
K CORE ASSEMBLY 1003084 QTY 24
MOLDING, K CORE 1004107 QTY 1
K CORE, WOUND, ASSEMBLY 1004108 QTY 1
WIRE, MAGNET, ELECTRICAL 1006711-20 QTY AR
CORE, MAGNETIC 1006773-2 QTY 1
HOLDER, COMPONENT 1004500 QTY 1
INSULATOR, PHOTO-GRAPHIC MASTER 1004214-1 1 1004214-2 1
WIRE, ELECTRICAL 1006757-1 QTY AR
INSULATION, SLEEVING ELECTRICAL 1006776-21 QTY AR
MATRIX ASSEMBLY CURRENT SWITCH MODULE B8 1003141-1 1 1003141-2 1
WIRE, ELECTRICAL 1006757-1 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-5 AR 1006806-8 AR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 3 Oct 63 DATE
03623

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN DATE 9-16-63
CHECKED 9/27/63
APPROVAL
APPROVAL
NASA APPROVAL W J Rhine 10-2-63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

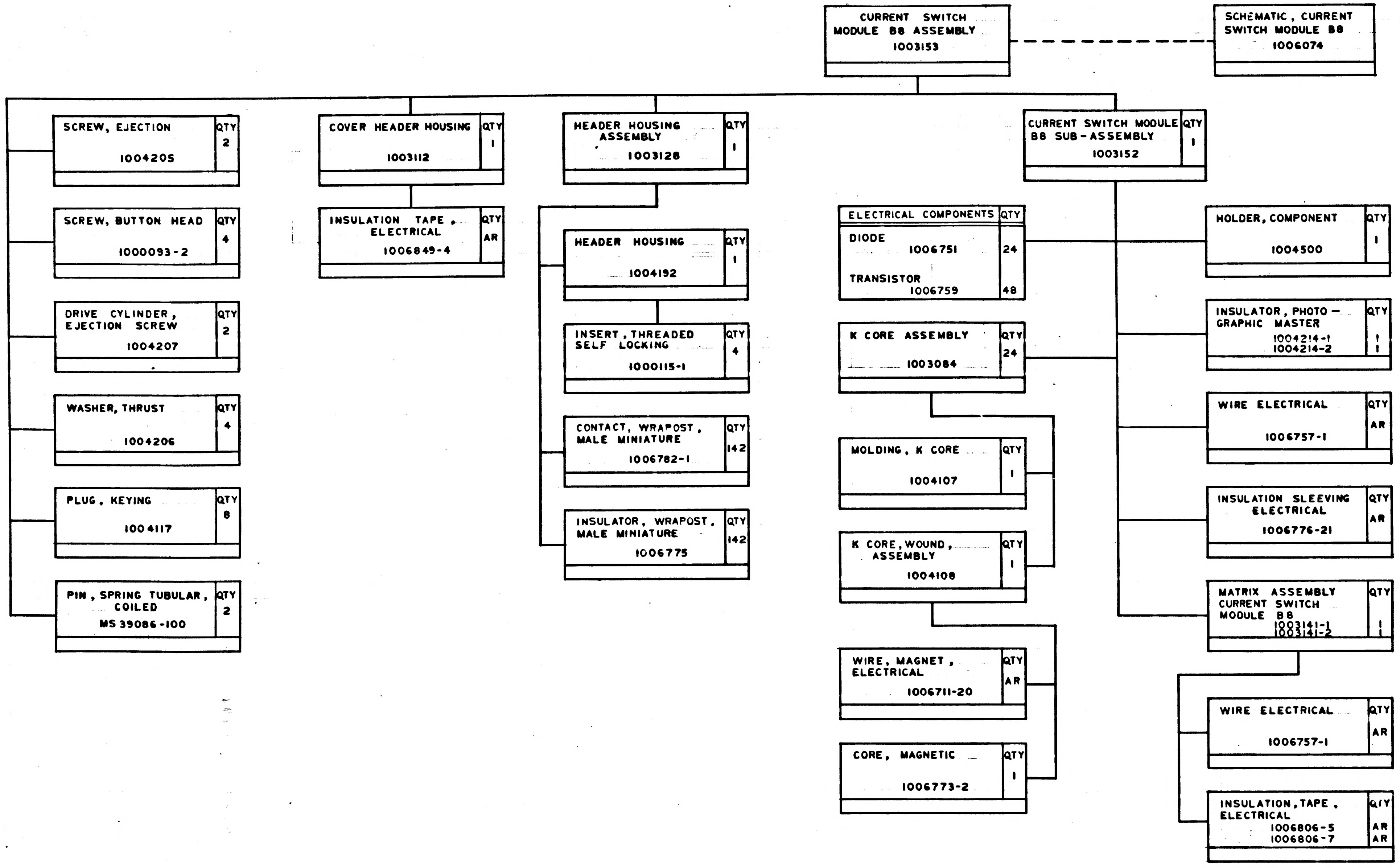
CURRENT SWITCH
MODULE B8
FAMILY TREE

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006205
SCALE — WT SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL


CURRENT SWITCH MODULE B8 ASSEMBLY 1003153
SCHEMATIC, CURRENT SWITCH MODULE B8 1006074
SCREW, EJECTION 1004205 QTY 2
SCREW, BUTTON HEAD 1000093-2 QTY 4
DRIVE CYLINDER, EJECTION SCREW 1004207 QTY 2
WASHER, THRUST 1004206 QTY 4
PLUG, KEYING 1004117 QTY 8
PIN, SPRING TUBULAR, COILED MS 39086-100 QTY 2
COVER HEADER HOUSING 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER HOUSING ASSEMBLY 1003128 QTY 1
HEADER HOUSING 1004192 QTY 1
INSERT, THREADED SELF LOCKING 1000115-1 QTY 4
CONTACT, WRAPOST, MALE MINIATURE 1006782-1 QTY 142
INSULATOR, WRAPOST, MALE MINIATURE 1006775 QTY 142
CURRENT SWITCH MODULE B8 SUB-ASSEMBLY 1003152 QTY 1
ELECTRICAL COMPONENTS QTY
DIODE 1006751 24
TRANSISTOR 1006759 48
K CORE ASSEMBLY 1003084 QTY 24
MOLDING, K CORE 1004107 QTY 1
K CORE, WOUND, ASSEMBLY 1004108 QTY 1
WIRE, MAGNET, ELECTRICAL 1006711-20 QTY AR
CORE, MAGNETIC 1006773-2 QTY 1
HOLDER, COMPONENT 1004500 QTY 1
INSULATOR, PHOTO-GRAPHIC MASTER 1004214-1 1 1004214-2 1 QTY
WIRE ELECTRICAL 1006757-1 QTY AR
INSULATION SLEEVING ELECTRICAL 1006776-21 QTY AR
MATRIX ASSEMBLY CURRENT SWITCH MODULE B8 1003141-1 1 1003141-2 1 QTY
WIRE ELECTRICAL 1006757-1 QTY AR
INSULATION, TAPE, ELECTRICAL 1006806-5 AR 1006806-7 AR QTY

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 3 Oct 63 DATE 03623

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

1006205

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

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CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN DATE 9-16-63
CHECKED 9/27/63
APPROVAL
APPROVAL
NASA APPROVAL 10-3-63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

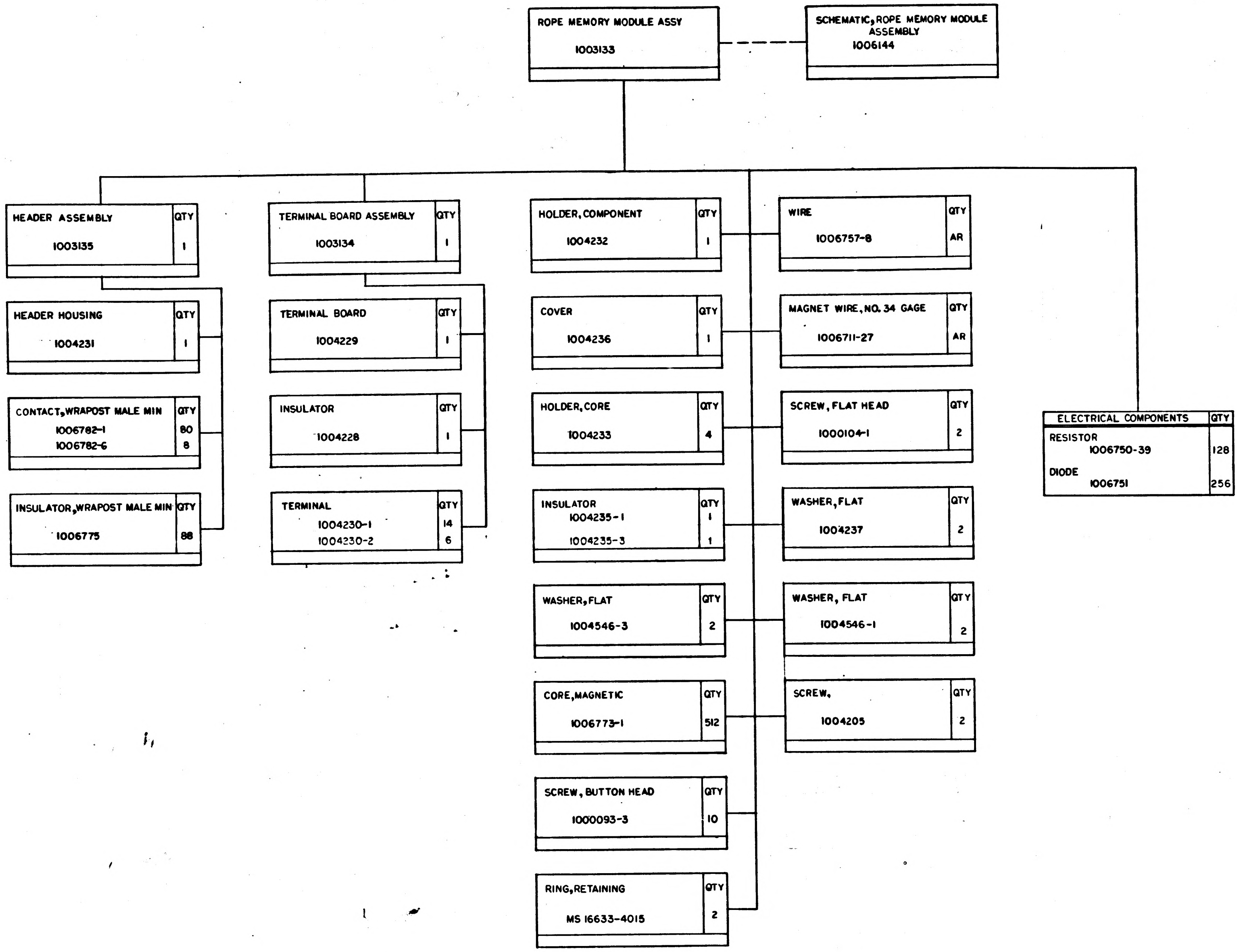
CURRENT SWITCH
MODULE B8
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006205
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 05109	12-10-63	


ROPE MEMORY MODULE ASSY
1003133
SCHEMATIC, ROPE MEMORY MODULE ASSEMBLY
1006144
HEADER ASSEMBLY
1003135
QTY
1
HEADER HOUSING
1004231
QTY
1
CONTACT, WRAPOST MALE MIN
1006782-1
1006782-6
QTY
80
8
INSULATOR, WRAPOST MALE MIN
1006775
QTY
88
TERMINAL BOARD ASSEMBLY
1003134
QTY
1
TERMINAL BOARD
1004229
QTY
1
INSULATOR
1004228
QTY
1
TERMINAL
1004230-1
1004230-2
QTY
14
6
HOLDER, COMPONENT
1004232
QTY
1
COVER
1004236
QTY
1
HOLDER, CORE
1004233
QTY
4
INSULATOR
1004235-1
1004235-3
QTY
1
1
WASHER, FLAT
1004546-3
QTY
2
CORE, MAGNETIC
1006773-1
QTY
512
SCREW, BUTTON HEAD
1000093-3
QTY
10
RING, RETAINING
MS 16633-4015
QTY
2
WIRE
1006757-8
QTY
AR
MAGNET WIRE, NO. 34 GAGE
1006711-27
QTY
AR
SCREW, FLAT HEAD
1000104-1
QTY
2
WASHER, FLAT
1004237
QTY
2
WASHER, FLAT
1004546-1
QTY
2
SCREW,
1004205
QTY
2
ELECTRICAL COMPONENTS
QTY
RESISTOR
1006750-39
128
DIODE
1006751
256

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. "AR" DENOTES AS REQUIRED

MASTER

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LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN W. Horgan DATE 8-13-63
CHECKED J. Bryher 9/27/63
APPROVAL
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NASA APPROVAL
MIT APPROVAL 3 Oct 63

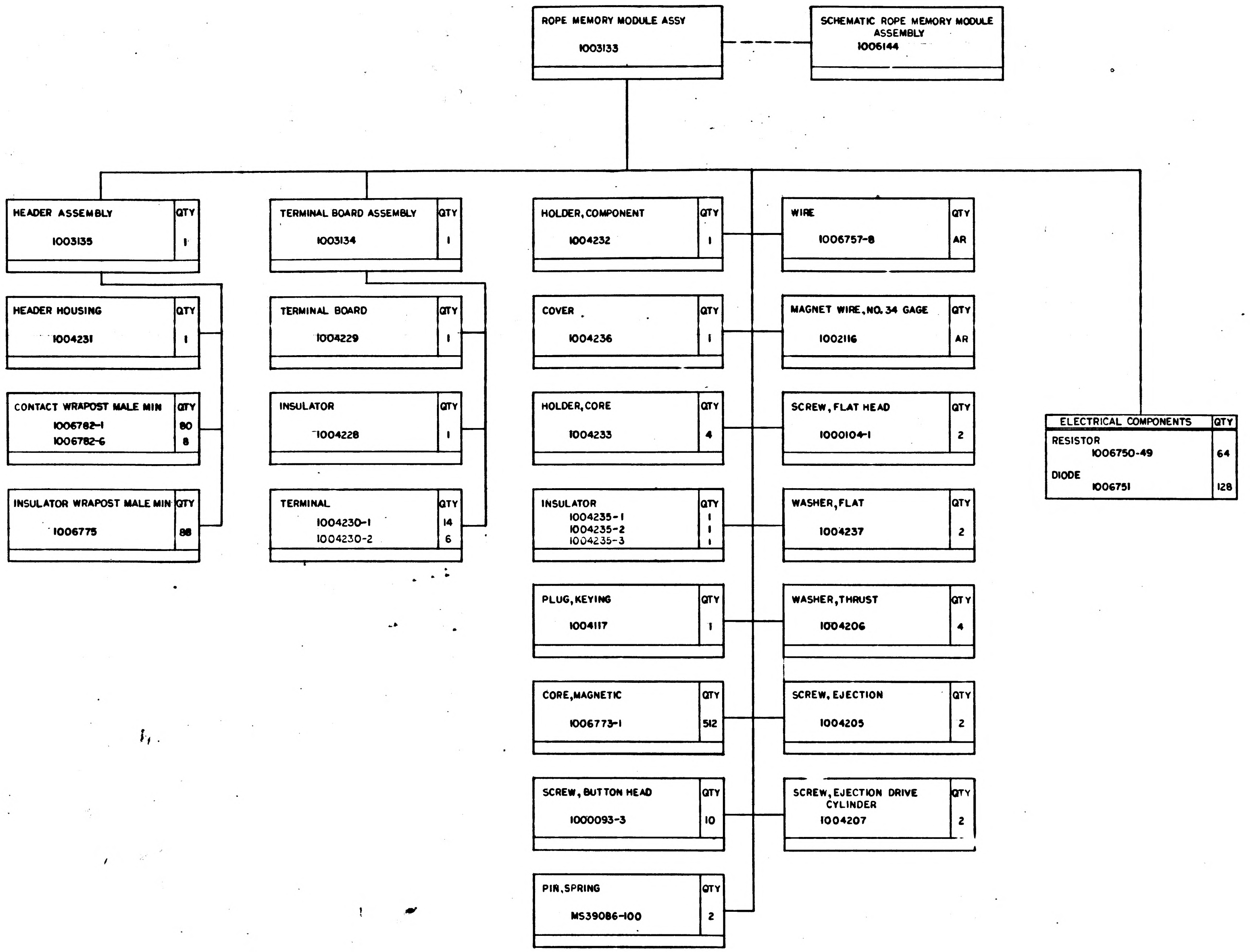
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE MEMORY MODULE
FAMILY TREE

CODE IDENT NO. — SIZE E NASA DRAWING NO. 1006206
SCALE — WT SHEET 1 OF 1

1006206 A

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS 03623			


ROPE MEMORY MODULE ASSY 1003133
SCHEMATIC ROPE MEMORY MODULE ASSEMBLY 1006144
HEADER ASSEMBLY 1003135 QTY 1
HEADER HOUSING 1004231 QTY 1
CONTACT WRAPOST MALE MIN 1006782-1 QTY 80 1006782-6 QTY 8
INSULATOR WRAPOST MALE MIN 1006775 QTY 88
TERMINAL BOARD ASSEMBLY 1003134 QTY 1
TERMINAL BOARD 1004229 QTY 1
INSULATOR 1004228 QTY 1
TERMINAL 1004230-1 QTY 14 1004230-2 QTY 6
HOLDER, COMPONENT 1004232 QTY 1
COVER 1004236 QTY 1
HOLDER, CORE 1004233 QTY 4
INSULATOR 1004235-1 QTY 1 1004235-2 QTY 1 1004235-3 QTY 1
PLUG, KEYING 1004117 QTY 1
CORE, MAGNETIC 1006773-1 QTY 512
SCREW, BUTTON HEAD 1000093-3 QTY 10
PIN, SPRING MS39086-100 QTY 2
WIRE 1006757-8 QTY AR
MAGNET WIRE, NO. 34 GAGE 1002116 QTY AR
SCREW, FLAT HEAD 1000104-1 QTY 2
WASHER, FLAT 1004237 QTY 2
WASHER, THRUST 1004206 QTY 4
SCREW, EJECTION 1004205 QTY 2
SCREW, EJECTION DRIVE CYLINDER 1004207 QTY 2
ELECTRICAL COMPONENTS QTY
RESISTOR 1006750-49 64
DIODE 1006751 128

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

NOTES:
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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

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MATERIAL
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INSTRUMENTATION LAB
Cambridge Mass
DWG NO CONTRACT
DRAWN W. Horgan DATE 8-13-63
CHECKED 8/21/63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE MEMORY MODULE
FAMILY TREE

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006206
SCALE WT SHEET 1 OF 1

1006206

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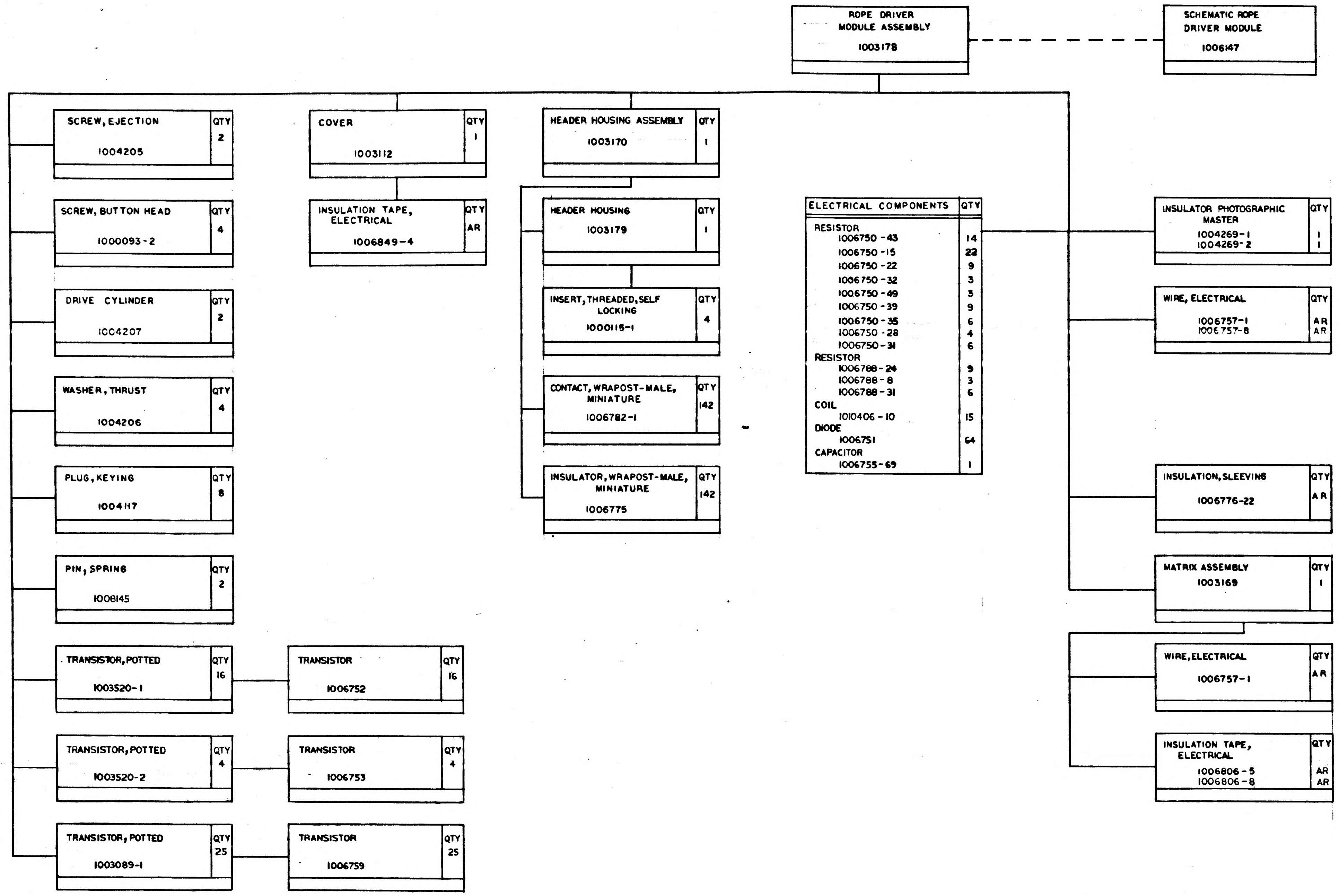
REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL


ROPE DRIVER MODULE ASSEMBLY 1003178
SCHEMATIC ROPE DRIVER MODULE 1006147
SCREW, EJECTION 1004205 QTY 2
SCREW, BUTTON HEAD 1000093-2 QTY 4
DRIVE CYLINDER 1004207 QTY 2
WASHER, THRUST 1004206 QTY 4
PLUG, KEYING 1004117 QTY 8
PIN, SPRING 1008145 QTY 2
TRANSISTOR, POTTED 1003520-1 QTY 16
TRANSISTOR 1006752 QTY 16
TRANSISTOR, POTTED 1003520-2 QTY 4
TRANSISTOR 1006753 QTY 4
TRANSISTOR, POTTED 1003089-1 QTY 25
TRANSISTOR 1006759 QTY 25
COVER 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER HOUSING ASSEMBLY 1003170 QTY 1
HEADER HOUSING 1003179 QTY 1
INSERT, THREADED, SELF LOCKING 1000115-1 QTY 4
CONTACT, WRAPOST-MALE, MINIATURE 1006782-1 QTY 142
INSULATOR, WRAPOST-MALE, MINIATURE 1006775 QTY 142
ELECTRICAL COMPONENTS QTY
RESISTOR
1006750 -43 14
1006750 -15 22
1006750 -22 9
1006750 -32 3
1006750 -49 3
1006750 -39 9
1006750 -35 6
1006750 -28 4
1006750 -31 6
RESISTOR
1006788 - 24 9
1006788 - 8 3
1006788 - 31 6
COIL
1010406 - 10 15
DIODE
1006751 64
CAPACITOR
1006755 - 69 1
INSULATOR PHOTOGRAPHIC MASTER 1004269-1 1004269-2 QTY 1 1
WIRE, ELECTRICAL 1006757-1 1006757-8 QTY AR AR
INSULATION, SLEEVING 1006776-22 QTY AR
MATRIX ASSEMBLY 1003169 QTY 1
WIRE, ELECTRICAL 1006757-1 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-5 1006806-8 QTY AR AR

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CLASS B RELEASE TDR No. 03623 DATE 30Oct63

NOTES
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CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN DATE
CHECKED 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL 10-3-63
MIT APPROVAL 30Oct63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE DRIVER B32 -B33
MODULE
FAMILY TREE

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006207
SCALE WT SHEET OF

1006207

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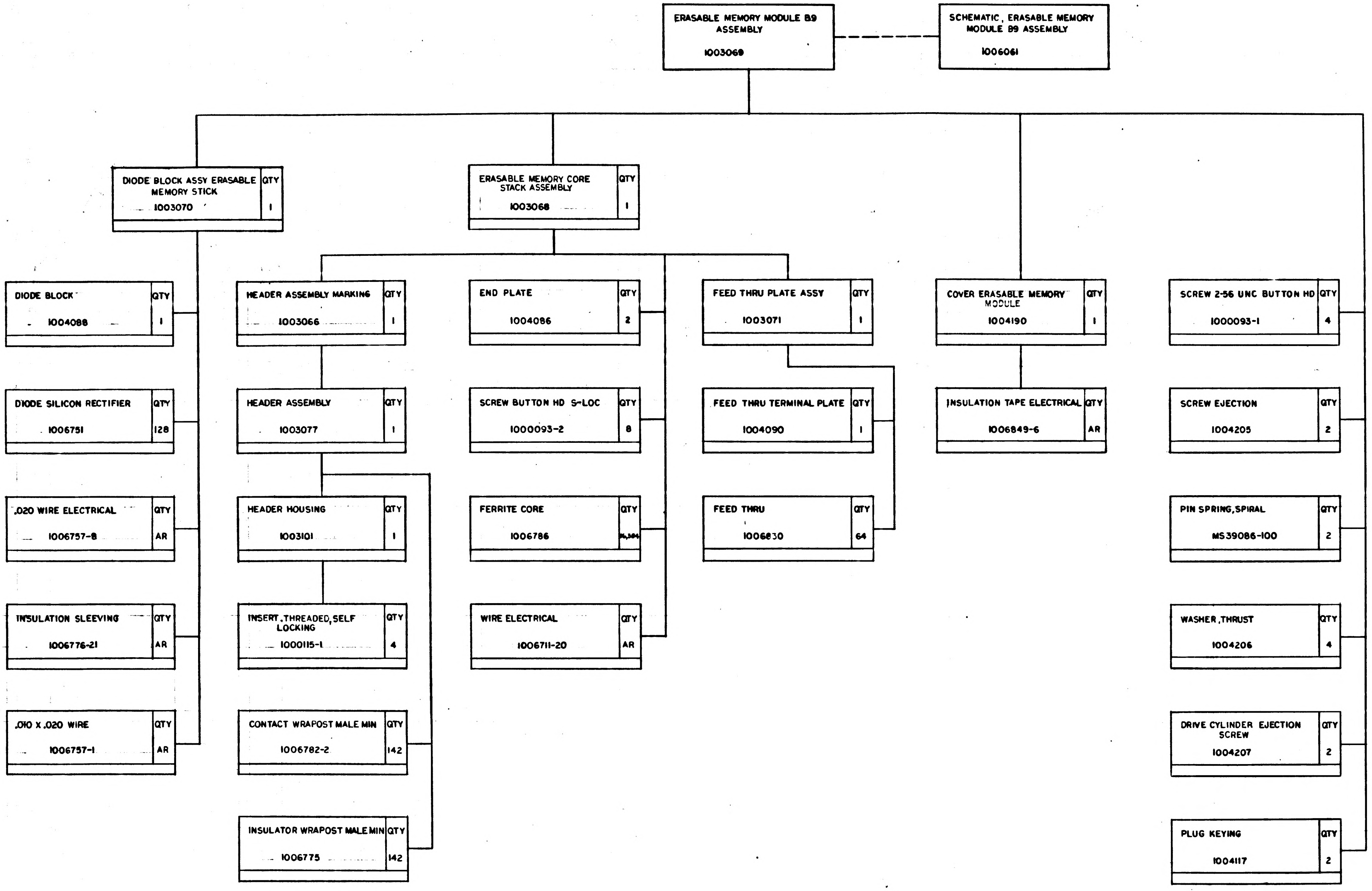
REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL


ERASABLE MEMORY MODULE B9 ASSEMBLY
1003069
SCHEMATIC, ERASABLE MEMORY MODULE B9 ASSEMBLY
1006061
DIODE BLOCK ASSY ERASABLE MEMORY STICK
1003070
QTY 1
ERASABLE MEMORY CORE STACK ASSEMBLY
1003068
QTY 1
DIODE BLOCK
1004088
QTY 1
DIODE SILICON RECTIFIER
1006751
QTY 128
.020 WIRE ELECTRICAL
1006757-8
QTY AR
INSULATION SLEEVING
1006776-21
QTY AR
.010 X .020 WIRE
1006757-1
QTY AR
HEADER ASSEMBLY MARKING
1003066
QTY 1
HEADER ASSEMBLY
1003077
QTY 1
HEADER HOUSING
1003101
QTY 1
INSERT, THREADED, SELF LOCKING
1000115-1
QTY 4
CONTACT WRAPOST MALE MIN
1006782-2
QTY 142
INSULATOR WRAPOST MALE MIN
1006775
QTY 142
END PLATE
1004086
QTY 2
SCREW BUTTON HD S-LOC
1000093-2
QTY 8
FERRITE CORE
1006786
QTY 16,384
WIRE ELECTRICAL
1006711-20
QTY AR
FEED THRU PLATE ASSY
1003071
QTY 1
FEED THRU TERMINAL PLATE
1004090
QTY 1
FEED THRU
1006830
QTY 64
COVER ERASABLE MEMORY MODULE
1004190
QTY 1
INSULATION TAPE ELECTRICAL
1006849-6
QTY AR
SCREW 2-56 UNC BUTTON HD
1000093-1
QTY 4
SCREW EJECTION
1004205
QTY 2
PIN SPRING, SPIRAL
MS39086-100
QTY 2
WASHER, THRUST
1004206
QTY 4
DRIVE CYLINDER EJECTION SCREW
1004207
QTY 2
PLUG KEYING
1004117
QTY 2

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

NOTES
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FINAL FINISH

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN W. Horgan DATE 9-18-63
CHECKED J. Buchan 9/27/63
APPROVAL
APPROVAL
NASA APPROVAL W. J. [illegible] 10-3-63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ERASABLE MEMORY
MODULE B9
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006208
SCALE
WT
SHEET 1 OF 1

1006208

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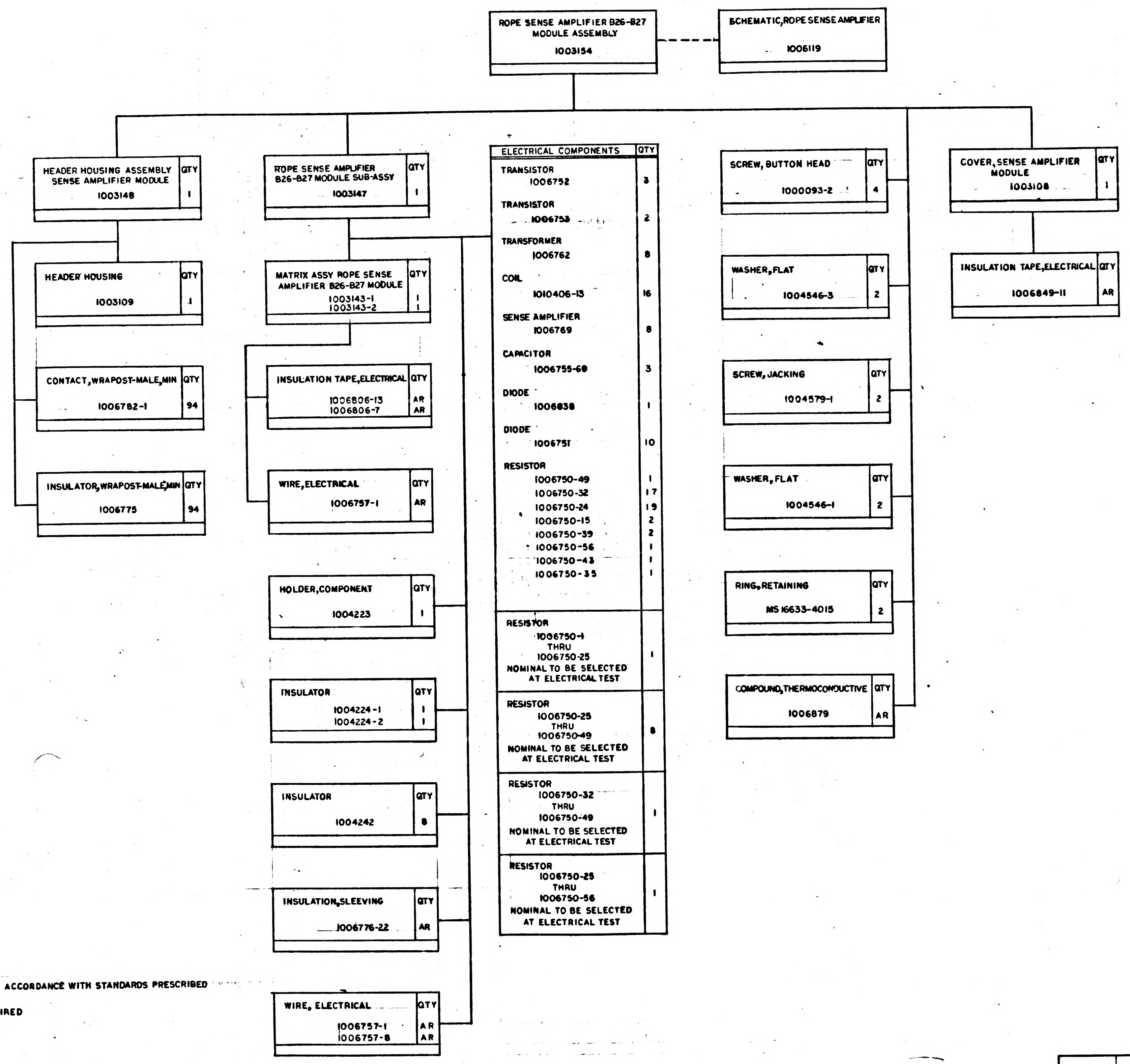
REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 05109	10-10-63	


ROPE SENSE AMPLIFIER B26-B27 MODULE ASSEMBLY
1003154
SCHEMATIC, ROPE SENSE AMPLIFIER
1006119
HEADER HOUSING ASSEMBLY SENSE AMPLIFIER MODULE
1003148
QTY 1
HEADER HOUSING
1003109
QTY 1
CONTACT, WRAPOST-MALE, MIN
1006782-1
QTY 94
INSULATOR, WRAPOST-MALE, MIN
1006775
QTY 94
ROPE SENSE AMPLIFIER B26-B27 MODULE SUB-ASSY
1003147
QTY 1
MATRIX ASSY ROPE SENSE AMPLIFIER B26-B27 MODULE
1003143-1 QTY 1
1003143-2 QTY 1
INSULATION TAPE, ELECTRICAL
1006806-13 QTY AR
1006806-7 QTY AR
WIRE, ELECTRICAL
1006757-1
QTY AR
HOLDER, COMPONENT
1004223
QTY 1
INSULATOR
1004224-1 QTY 1
1004224-2 QTY 1
INSULATOR
1004242
QTY 8
INSULATION, SLEEVING
1006776-22
QTY AR
WIRE, ELECTRICAL
1006757-1 QTY AR
1006757-8 QTY AR
ELECTRICAL COMPONENTS
QTY
TRANSISTOR
1006752 3
TRANSISTOR
1006753 2
TRANSFORMER
1006762 8
COIL
1010406-13 16
SENSE AMPLIFIER
1006769 8
CAPACITOR
1006755-69 3
DIODE
1006838 1
DIODE
1006751 10
RESISTOR
1006750-49 1
1006750-32 17
1006750-24 19
1006750-15 2
1006750-39 2
1006750-56 1
1006750-43 1
1006750-35 1
RESISTOR
1006750-1 THRU 1006750-25 NOMINAL TO BE SELECTED AT ELECTRICAL TEST 1
RESISTOR
1006750-25 THRU 1006750-49 NOMINAL TO BE SELECTED AT ELECTRICAL TEST 8
RESISTOR
1006750-32 THRU 1006750-49 NOMINAL TO BE SELECTED AT ELECTRICAL TEST 1
RESISTOR
1006750-25 THRU 1006750-56 NOMINAL TO BE SELECTED AT ELECTRICAL TEST 1
SCREW, BUTTON HEAD
1000093-2
QTY 4
WASHER, FLAT
1004546-3
QTY 2
SCREW, JACKING
1004579-1
QTY 2
WASHER, FLAT
1004546-1
QTY 2
RING, RETAINING
MS 16633-4015
QTY 2
COMPOUND, THERMOCONDUCTIVE
1006879
QTY AR
COVER, SENSE AMPLIFIER MODULE
1003108
QTY 1
INSULATION TAPE, ELECTRICAL
1006849-11
QTY AR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN W. Horgan DATE 9-20-63
CHECKED 30 Oct 63
APPROVAL
APPROVAL 30 Oct 63
NASA APPROVAL W J Rhine 10-3-63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

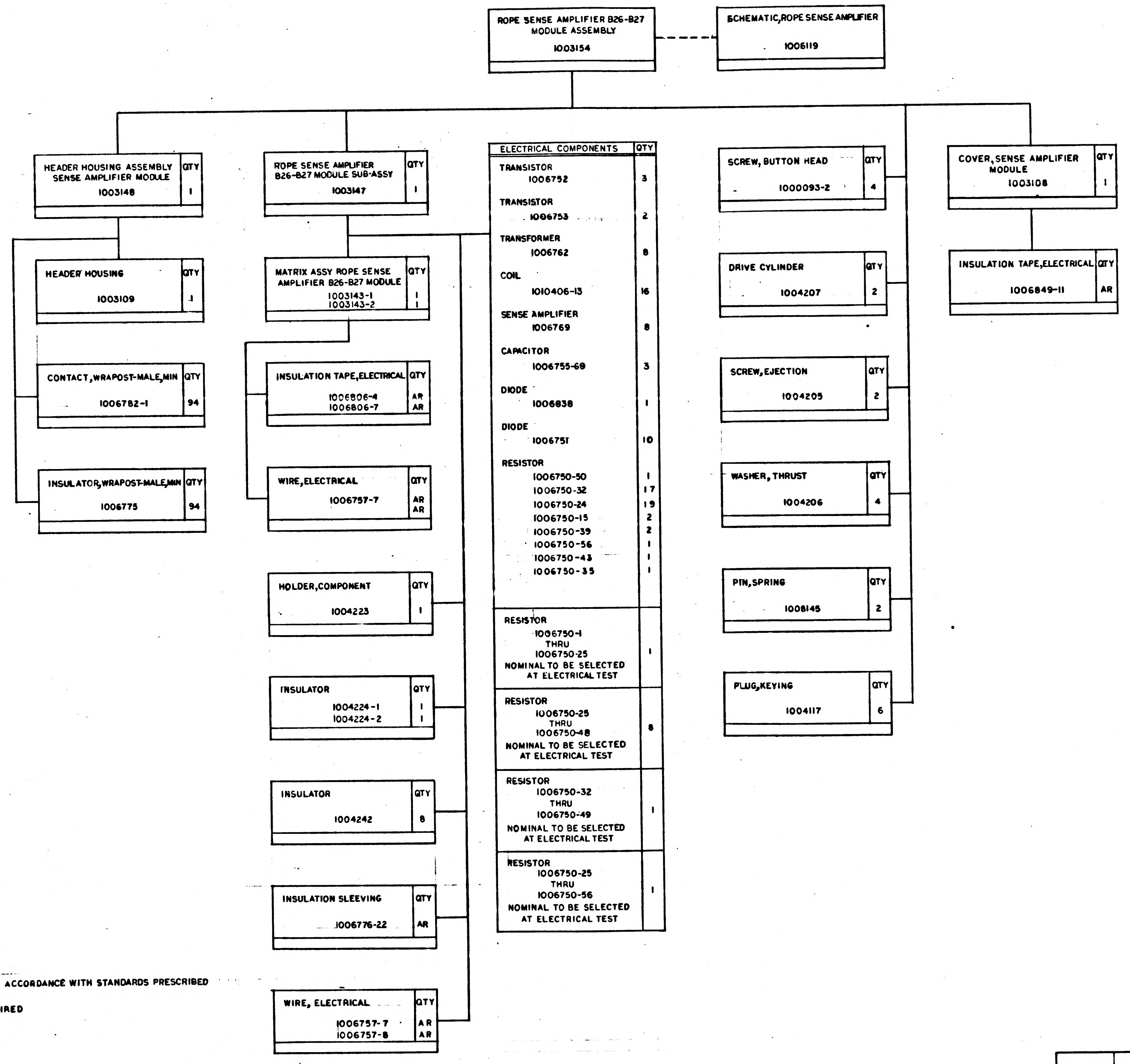
ROPE SENSE AMPLIFIER
B26-B27 MODULE
FAMILY TREE

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006209
SCALE — WT — SHEET 1 OF 1

1006209 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL


ROPE SENSE AMPLIFIER B26-B27 MODULE ASSEMBLY
1003154
SCHEMATIC, ROPE SENSE AMPLIFIER
1006119
HEADER HOUSING ASSEMBLY SENSE AMPLIFIER MODULE
1003148
QTY 1
HEADER HOUSING
1003109
QTY 1
CONTACT, WRAPOST-MALE, MIN
1006782-1
QTY 94
INSULATOR, WRAPOST-MALE, MIN
1006775
QTY 94
ROPE SENSE AMPLIFIER B26-B27 MODULE SUB-ASSY
1003147
QTY 1
MATRIX ASSY ROPE SENSE AMPLIFIER B26-B27 MODULE
1003143-1
1003143-2
QTY 1 1
INSULATION TAPE, ELECTRICAL
1006806-4
1006806-7
QTY AR AR
WIRE, ELECTRICAL
1006757-7
QTY AR AR
HOLDER, COMPONENT
1004223
QTY 1
INSULATOR
1004224-1
1004224-2
QTY 1 1
INSULATOR
1004242
QTY 8
INSULATION SLEEVING
1006776-22
QTY AR
WIRE, ELECTRICAL
1006757-7
1006757-8
QTY AR AR
ELECTRICAL COMPONENTS
QTY
TRANSISTOR
1006752
3
TRANSISTOR
1006753
2
TRANSFORMER
1006762
8
COIL
1010406-13
16
SENSE AMPLIFIER
1006769
8
CAPACITOR
1006755-69
3
DIODE
1006838
1
DIODE
1006751
10
RESISTOR
1006750-50
1
1006750-32
17
1006750-24
19
1006750-15
2
1006750-39
2
1006750-56
1
1006750-43
1
1006750-35
1
RESISTOR
1006750-1 THRU 1006750-25
NOMINAL TO BE SELECTED AT ELECTRICAL TEST
1
RESISTOR
1006750-25 THRU 1006750-48
NOMINAL TO BE SELECTED AT ELECTRICAL TEST
8
RESISTOR
1006750-32 THRU 1006750-49
NOMINAL TO BE SELECTED AT ELECTRICAL TEST
1
RESISTOR
1006750-25 THRU 1006750-56
NOMINAL TO BE SELECTED AT ELECTRICAL TEST
1
SCREW, BUTTON HEAD
1000093-2
QTY 4
DRIVE CYLINDER
1004207
QTY 2
SCREW, EJECTION
1004205
QTY 2
WASHER, THRUST
1004206
QTY 4
PIN, SPRING
1008145
QTY 2
PLUG, KEYING
1004117
QTY 6
COVER, SENSE AMPLIFIER MODULE
1003108
QTY 1
INSULATION TAPE, ELECTRICAL
1006849-11
QTY AR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN W. Horgan DATE 9-20-63
CHECKED 30 Oct 63
APPROVAL
APPROVAL E. J. Hoag
NASA APPROVAL W J Rhine 10-3-63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE SENSE AMPLIFIER
B26-B27 MODULE
FAMILY TREE

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006209
SCALE — | WT — | SHEET 1 OF 1

1006209

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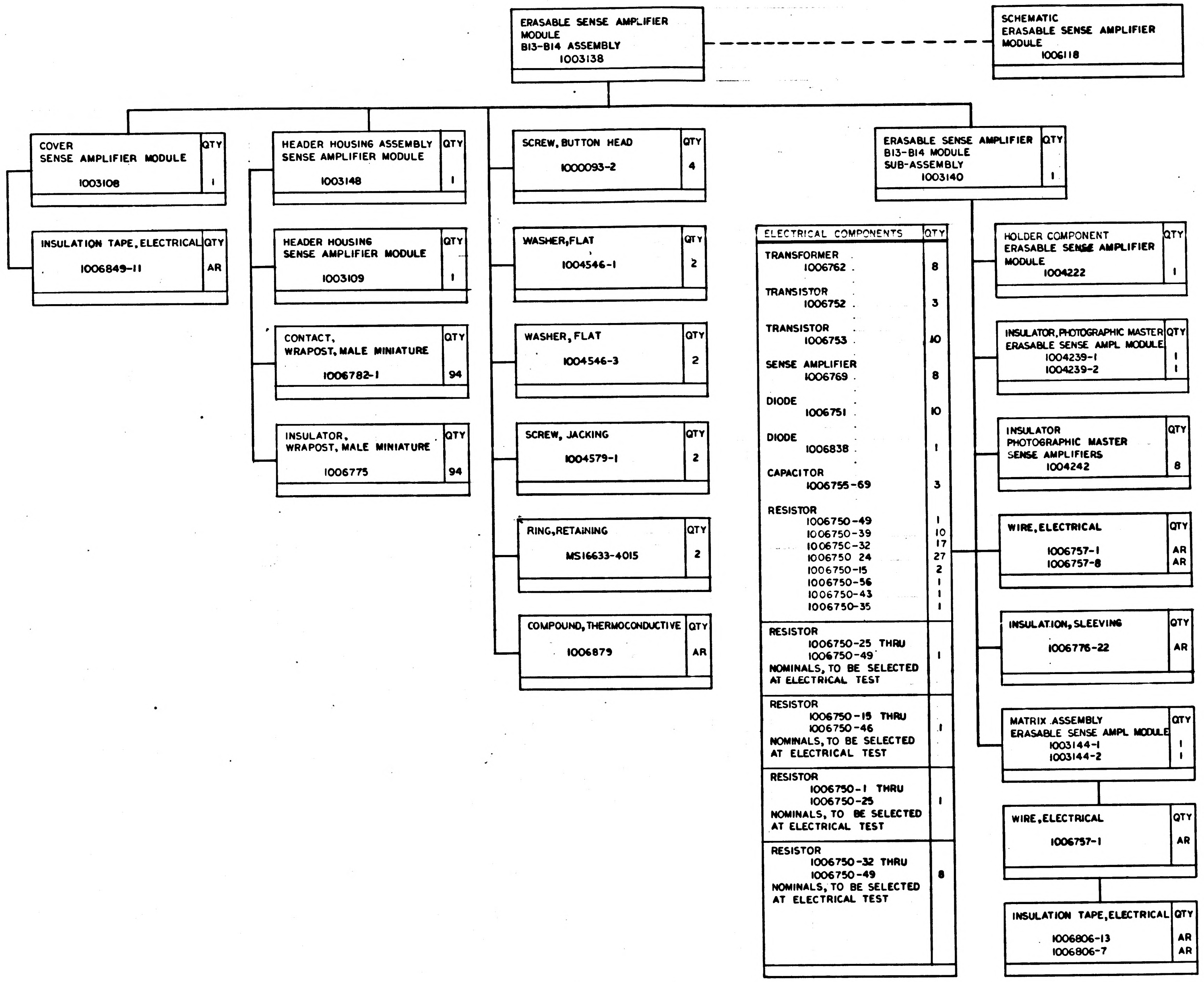
REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED FER TDRR 05110	63	


ERASABLE SENSE AMPLIFIER MODULE B13-B14 ASSEMBLY 1003138
SCHEMATIC ERASABLE SENSE AMPLIFIER MODULE 1006118
COVER SENSE AMPLIFIER MODULE 1003108 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-11 QTY AR
HEADER HOUSING ASSEMBLY SENSE AMPLIFIER MODULE 1003148 QTY 1
HEADER HOUSING SENSE AMPLIFIER MODULE 1003109 QTY 1
CONTACT, WRAPOST, MALE MINIATURE 1006782-1 QTY 94
INSULATOR, WRAPOST, MALE MINIATURE 1006775 QTY 94
SCREW, BUTTON HEAD 1000093-2 QTY 4
WASHER, FLAT 1004546-1 QTY 2
WASHER, FLAT 1004546-3 QTY 2
SCREW, JACKING 1004579-1 QTY 2
RING, RETAINING MS16633-4015 QTY 2
COMPOUND, THERMOCONDUCTIVE 1006879 QTY AR
ERASABLE SENSE AMPLIFIER B13-B14 MODULE SUB-ASSEMBLY 1003140 QTY 1
ELECTRICAL COMPONENTS QTY
TRANSFORMER 1006762 8
TRANSISTOR 1006752 3
TRANSISTOR 1006753 10
SENSE AMPLIFIER 1006769 8
DIODE 1006751 10
DIODE 1006838 1
CAPACITOR 1006755-69 3
RESISTOR
1006750-49 1
1006750-39 10
1006750-32 17
1006750 24 27
1006750-15 2
1006750-56 1
1006750-43 1
1006750-35 1
RESISTOR 1006750-25 THRU 1006750-49 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST 1
RESISTOR 1006750-15 THRU 1006750-46 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST 1
RESISTOR 1006750-1 THRU 1006750-25 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST 1
RESISTOR 1006750-32 THRU 1006750-49 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST 8
HOLDER COMPONENT ERASABLE SENSE AMPLIFIER MODULE 1004222 QTY 1
INSULATOR, PHOTOGRAPHIC MASTER ERASABLE SENSE AMPL MODULE 1004239-1 1 1004239-2 1
INSULATOR PHOTOGRAPHIC MASTER SENSE AMPLIFIERS 1004242 QTY 8
WIRE, ELECTRICAL 1006757-1 AR 1006757-8 AR
INSULATION, SLEEVING 1006776-22 QTY AR
MATRIX ASSEMBLY ERASABLE SENSE AMPL MODULE 1003144-1 1 1003144-2 1
WIRE, ELECTRICAL 1006757-1 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-13 AR 1006806-7 AR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 30-8-63

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS
DRAWN DATE 9/18/63
CHECKED 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL 10-3-63
MIT APPROVAL 3 Oct

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

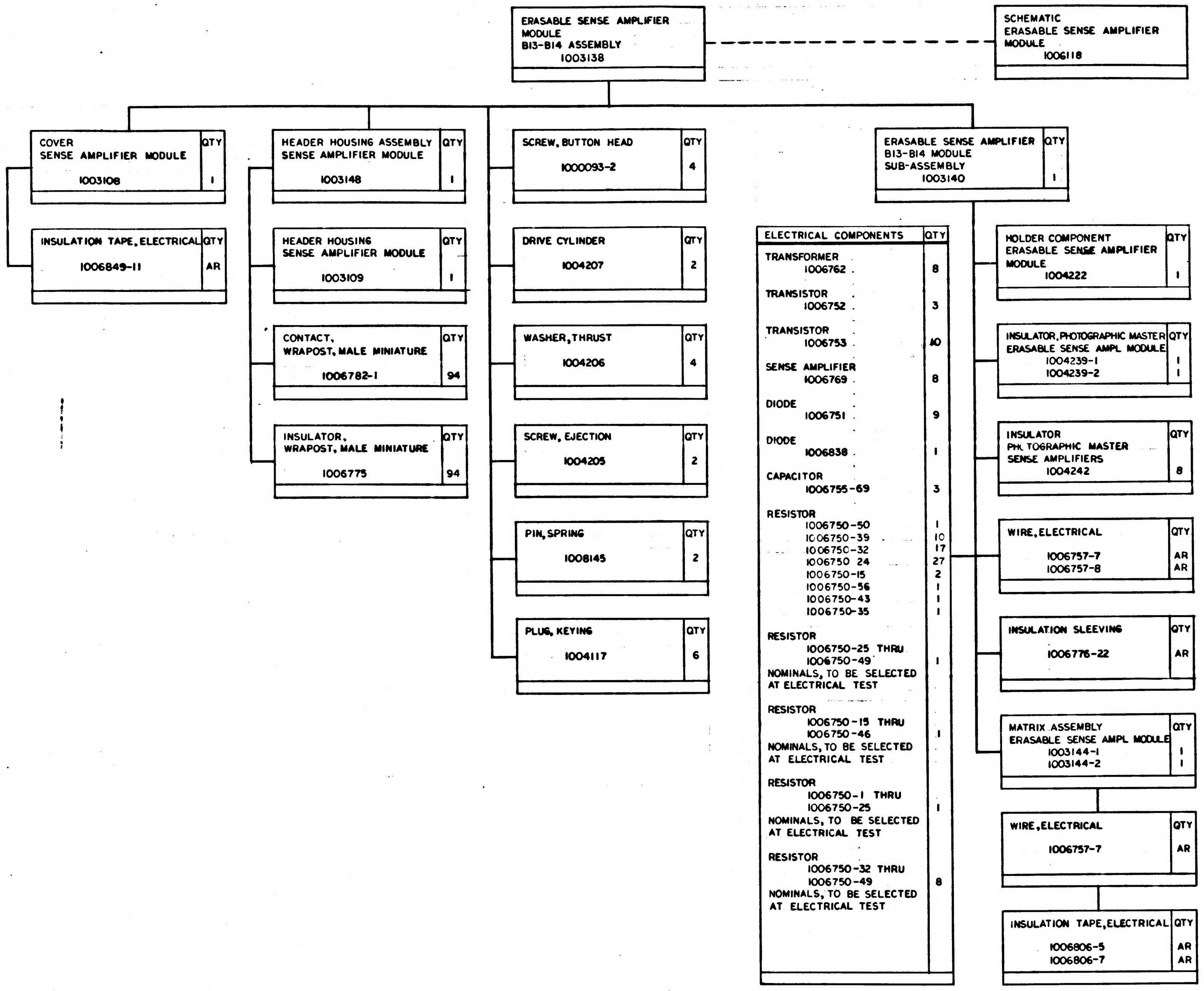
ERASABLE SENSE
AMPLIFIER MODULE B13-B14
FAMILY TREE

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006210
SCALE
WT
SHEET OF

1006210 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL


ERASABLE SENSE AMPLIFIER MODULE
B13-B14 ASSEMBLY
1003138
SCHEMATIC
ERASABLE SENSE AMPLIFIER MODULE
1006118
COVER
SENSE AMPLIFIER MODULE
1003108
QTY 1
INSULATION TAPE, ELECTRICAL
1006849-11
QTY AR
HEADER HOUSING ASSEMBLY
SENSE AMPLIFIER MODULE
1003148
QTY 1
HEADER HOUSING
SENSE AMPLIFIER MODULE
1003109
QTY 1
CONTACT,
WRAPOST, MALE MINIATURE
1006782-1
QTY 94
INSULATOR,
WRAPOST, MALE MINIATURE
1006775
QTY 94
SCREW, BUTTON HEAD
1000093-2
QTY 4
DRIVE CYLINDER
1004207
QTY 2
WASHER, THRUST
1004206
QTY 4
SCREW, EJECTION
1004205
QTY 2
PIN, SPRING
1008145
QTY 2
PLUG, KEYING
1004117
QTY 6
ERASABLE SENSE AMPLIFIER
B13-B14 MODULE
SUB-ASSEMBLY
1003140
QTY 1
HOLDER COMPONENT
ERASABLE SENSE AMPLIFIER MODULE
1004222
QTY 1
INSULATOR, PHOTOGRAPHIC MASTER
ERASABLE SENSE AMPL MODULE
1004239-1
1004239-2
QTY 1 1
INSULATOR
PHOTOGRAPHIC MASTER
SENSE AMPLIFIERS
1004242
QTY 8
WIRE, ELECTRICAL
1006757-7
1006757-8
QTY AR AR
INSULATION SLEEVING
1006776-22
QTY AR
MATRIX ASSEMBLY
ERASABLE SENSE AMPL MODULE
1003144-1
1003144-2
QTY 1 1
WIRE, ELECTRICAL
1006757-7
QTY AR
INSULATION TAPE, ELECTRICAL
1006806-5
1006806-7
QTY AR AR

ELECTRICAL COMPONENTS	QTY
TRANSFORMER 1006762	8
TRANSISTOR 1006752	3
TRANSISTOR 1006753	10
SENSE AMPLIFIER 1006769	8
DIODE 1006751	9
DIODE 1006838	1
CAPACITOR 1006755-69	3
RESISTOR 1006750-50	1
1006750-39	10
1006750-32	17
1006750 24	27
1006750-15	2
1006750-56	1
1006750-43	1
1006750-35	1
RESISTOR 1006750-25 THRU 1006750-49 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST	1
RESISTOR 1006750-15 THRU 1006750-46 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST	1
RESISTOR 1006750-1 THRU 1006750-25 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST	1
RESISTOR 1006750-32 THRU 1006750-49 NOMINALS, TO BE SELECTED AT ELECTRICAL TEST	8

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN DATE 9/18/63
CHECKED 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL 10-3-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ERASABLE SENSE
AMPLIFIER MODULE
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006210
SCALE
WT
SHEET OF

1006210

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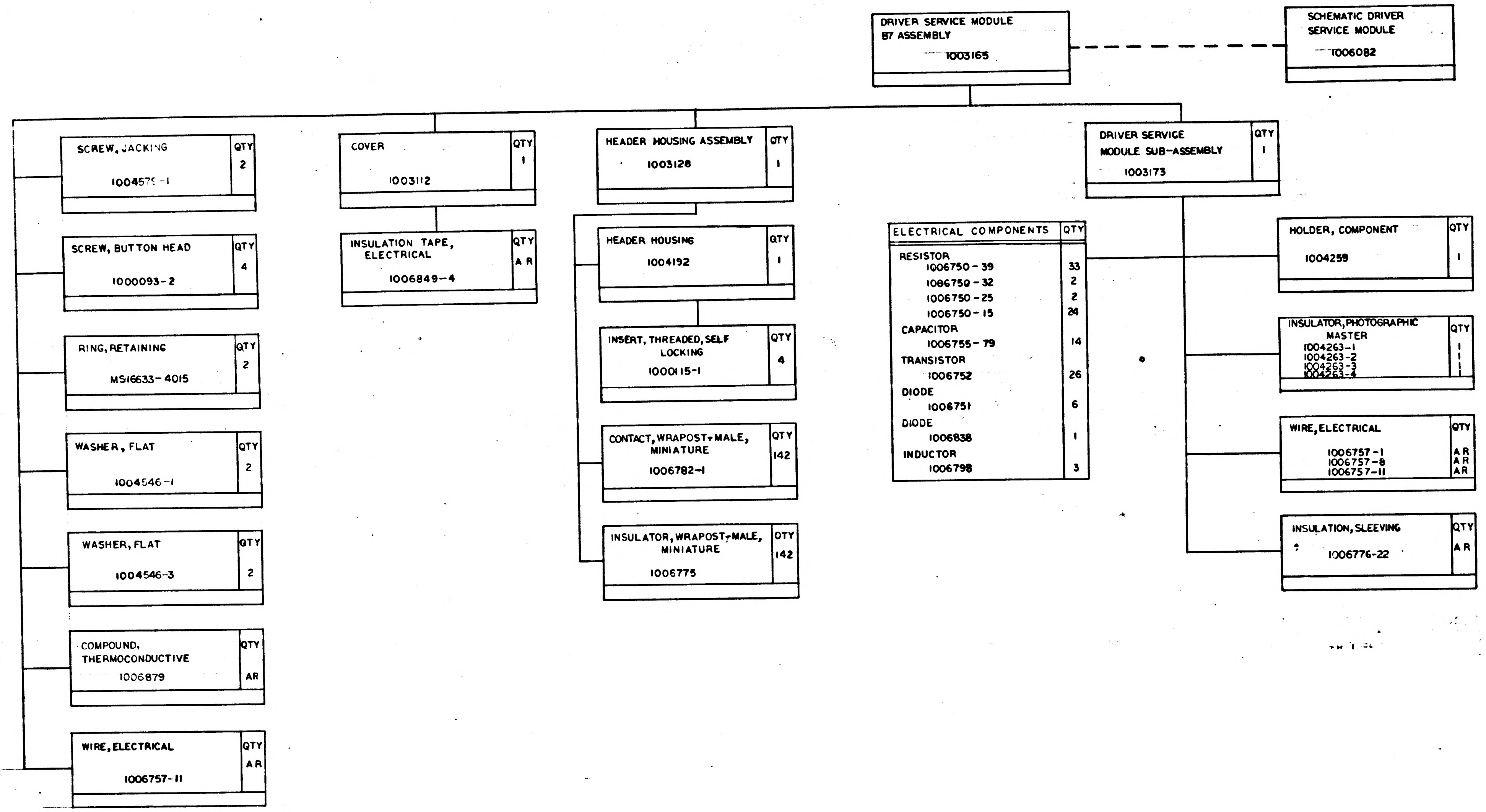
REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 05110		


DRIVER SERVICE MODULE B7 ASSEMBLY 1003165
SCHEMATIC DRIVER SERVICE MODULE 1006082
SCREW, JACKING 1004579-1 QTY 2
SCREW, BUTTON HEAD 1000093-2 QTY 4
RING, RETAINING MS16633-4015 QTY 2
WASHER, FLAT 1004546-1 QTY 2
WASHER, FLAT 1004546-3 QTY 2
COMPOUND, THERMOCONDUCTIVE 1006879 QTY AR
WIRE, ELECTRICAL 1006757-11 QTY AR
COVER 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER HOUSING ASSEMBLY 1003128 QTY 1
HEADER HOUSING 1004192 QTY 1
INSERT, THREADED, SELF LOCKING 1000115-1 QTY 4
CONTACT, WRAPOST-MALE, MINIATURE 1006782-1 QTY 142
INSULATOR, WRAPOST-MALE, MINIATURE 1006775 QTY 142
DRIVER SERVICE MODULE SUB-ASSEMBLY 1003173 QTY 1
ELECTRICAL COMPONENTS QTY
RESISTOR
1006750-39 33
1006750-32 2
1006750-25 2
1006750-15 24
CAPACITOR
1006755-79 14
TRANSISTOR
1006752 26
DIODE
1006751 6
DIODE
1006838 1
INDUCTOR
1006798 3
HOLDER, COMPONENT 1004259 QTY 1
INSULATOR, PHOTOGRAPHIC MASTER QTY
1004263-1 1
1004263-2 1
1004263-3 1
1004263-4 1
WIRE, ELECTRICAL QTY
1006757-1 AR
1006757-8 AR
1006757-11 AR
INSULATION, SLEEVING 1006776-22 QTY AR

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 30 Oct 63

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
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DO NOT SCALE THIS DRAWING
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HEAT TREATMENT
FINAL FINISH

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN Al Sullivan DATE 15 Oct 63
CHECKED 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL W J Rhine 10-3-63
MIT APPROVAL 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRIVER SERVICE
B7 MODULE
FAMILY TREE

CODE IDENT NO. — SIZE E NASA DRAWING NO. 1006211
SCALE WT SHEET OF

1006211 1

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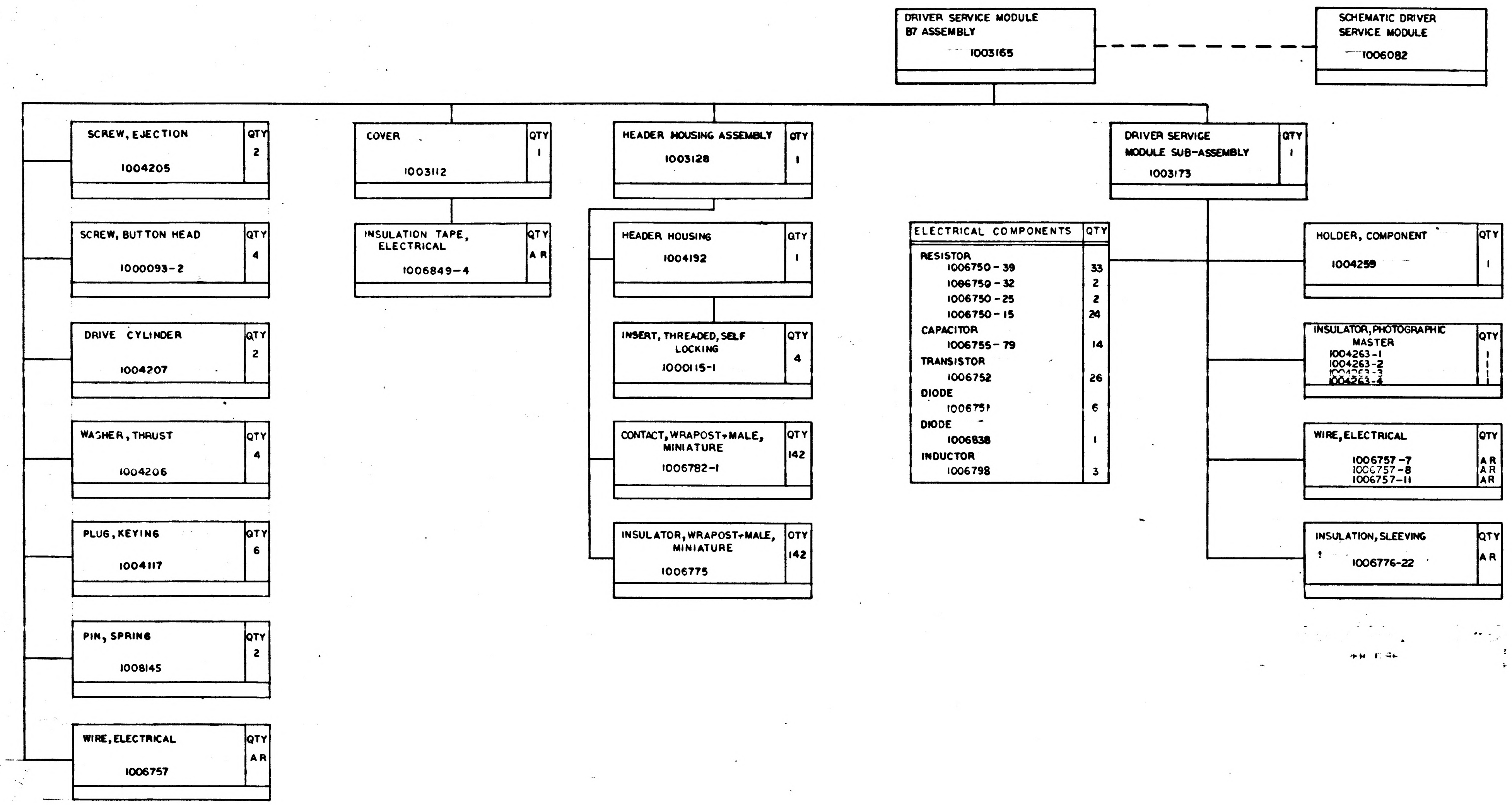
DRIVER SERVICE MODULE B7 ASSEMBLY 1003165
SCHEMATIC DRIVER SERVICE MODULE 1006082
SCREW, EJECTION 1004205 QTY 2
SCREW, BUTTON HEAD 1000093-2 QTY 4
DRIVE CYLINDER 1004207 QTY 2
WASHER, THRUST 1004206 QTY 4
PLUG, KEYING 1004117 QTY 6
PIN, SPRING 1008145 QTY 2
WIRE, ELECTRICAL 1006757 QTY AR
COVER 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER HOUSING ASSEMBLY 1003128 QTY 1
HEADER HOUSING 1004192 QTY 1
INSERT, THREADED, SELF LOCKING 1000115-1 QTY 4
CONTACT, WRAPOST-MALE, MINIATURE 1006782-1 QTY 142
INSULATOR, WRAPOST-MALE, MINIATURE 1006775 QTY 142
DRIVER SERVICE MODULE SUB-ASSEMBLY 1003173 QTY 1
ELECTRICAL COMPONENTS QTY
RESISTOR
1006750-39 33
1006750-32 2
1006750-25 2
1006750-15 24
CAPACITOR
1006755-79 14
TRANSISTOR
1006752 26
DIODE
1006751 6
DIODE
1006838 1
INDUCTOR
1006798 3
HOLDER, COMPONENT 1004259 QTY 1
INSULATOR, PHOTOGRAPHIC MASTER QTY
1004263-1 1
1004263-2 1
1004263-3 1
1004263-4 1
WIRE, ELECTRICAL QTY
1006757-7 AR
1006757-8 AR
1006757-11 AR
INSULATION, SLEEVING 1006776-22 QTY AR

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

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DO NOT SCALE THIS DRAWING
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HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Al Sullivan DATE 25 Sep 63
CHECKED 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL W J 10-3-63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRIVER SERVICE
B7 MODULE
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006211
SCALE
WT
SHEET OF

1006211

1006211 1

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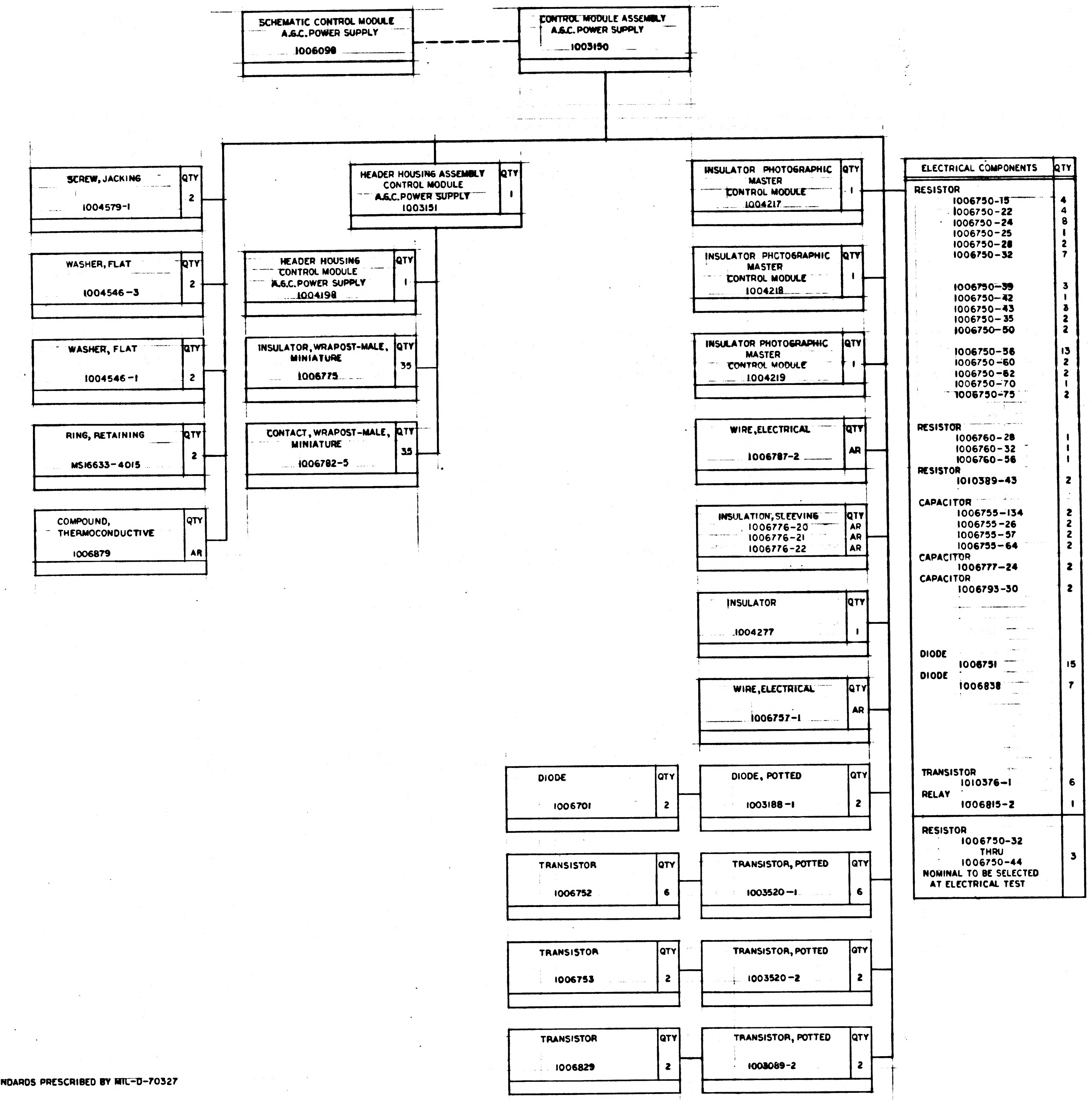
REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 05110		


SCHEMATIC CONTROL MODULE A.G.C. POWER SUPPLY 1006098
CONTROL MODULE ASSEMBLY A.G.C. POWER SUPPLY 1003150
SCREW, JACKING 1004579-1 QTY 2
WASHER, FLAT 1004546-3 QTY 2
WASHER, FLAT 1004546-1 QTY 2
RING, RETAINING MS16633-4015 QTY 2
COMPOUND, THERMOCONDUCTIVE 1006879 QTY AR
HEADER HOUSING ASSEMBLY CONTROL MODULE A.G.C. POWER SUPPLY 1003151 QTY 1
HEADER HOUSING CONTROL MODULE A.G.C. POWER SUPPLY 1004198 QTY 1
INSULATOR, WRAPOST-MALE, MINIATURE 1006775 QTY 35
CONTACT, WRAPOST-MALE, MINIATURE 1006782-5 QTY 35
INSULATOR PHOTOGRAPHIC MASTER CONTROL MODULE 1004217 QTY 1
INSULATOR PHOTOGRAPHIC MASTER CONTROL MODULE 1004218 QTY 1
INSULATOR PHOTOGRAPHIC MASTER CONTROL MODULE 1004219 QTY 1
WIRE, ELECTRICAL 1006787-2 QTY AR
INSULATION, SLEEVING 1006776-20 QTY AR
1006776-21 AR
1006776-22 AR
INSULATOR 1004277 QTY 1
WIRE, ELECTRICAL 1006757-1 QTY AR
DIODE 1006701 QTY 2
DIODE, POTTED 1003188-1 QTY 2
TRANSISTOR 1006752 QTY 6
TRANSISTOR, POTTED 1003520-1 QTY 6
TRANSISTOR 1006753 QTY 2
TRANSISTOR, POTTED 1003520-2 QTY 2
TRANSISTOR 1006829 QTY 2
TRANSISTOR, POTTED 1003089-2 QTY 2

ELECTRICAL COMPONENTS	QTY
RESISTOR	
1006750-15	4
1006750-22	4
1006750-24	8
1006750-25	1
1006750-28	2
1006750-32	7
1006750-39	3
1006750-42	1
1006750-43	3
1006750-35	2
1006750-50	2
1006750-56	13
1006750-60	2
1006750-62	2
1006750-70	1
1006750-75	2
RESISTOR	
1006760-28	1
1006760-32	1
1006760-56	1
RESISTOR	
1010389-43	2
CAPACITOR	
1006755-134	2
1006755-26	2
1006755-57	2
1006755-64	2
CAPACITOR	
1006777-24	2
CAPACITOR	
1006793-30	2
DIODE	
1006751	15
DIODE	
1006838	7
TRANSISTOR	
1010376-1	6
RELAY	
1006815-2	1
RESISTOR 1006750-32 THRU 1006750-44 NOMINAL TO BE SELECTED AT ELECTRICAL TEST	3

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 30 Oct 63

NOTES
1 INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2 AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

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CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN Ed Powers DATE 26Oct63
CHECKED 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL 10-3-63
MIT APPROVAL 30Oct63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL MODULE B12
AGC POWER SUPPLY
FAMILY TREE

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006212
SCALE
WT
SHEET OF

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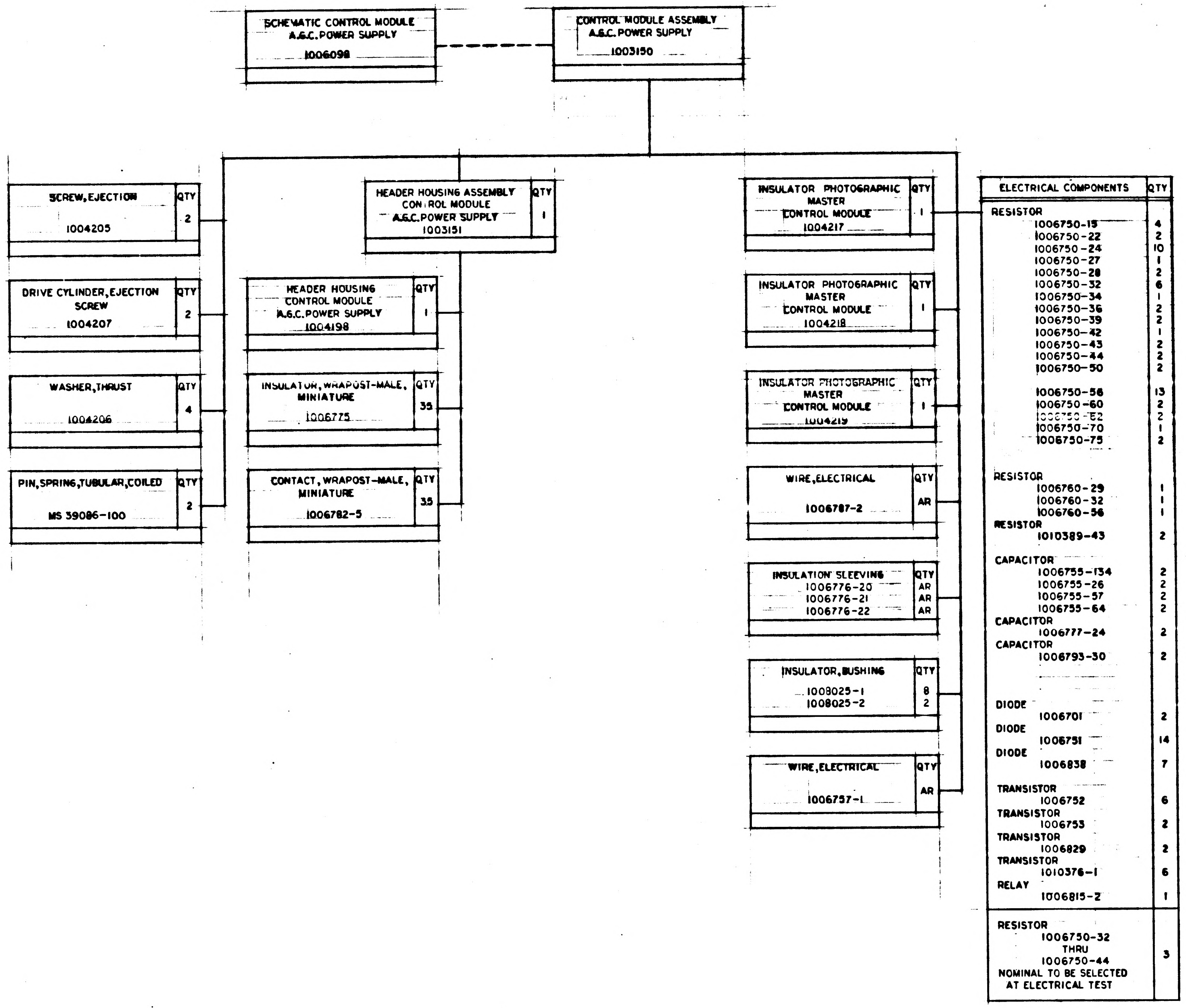
REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL


SCHEMATIC CONTROL MODULE A.G.C. POWER SUPPLY 1006098
CONTROL MODULE ASSEMBLY A.G.C. POWER SUPPLY 1003150
SCREW, EJECTION 1004205 QTY 2
DRIVE CYLINDER, EJECTION SCREW 1004207 QTY 2
WASHER, THRUST 1004206 QTY 4
PIN, SPRING, TUBULAR, COILED MS 39086-100 QTY 2
HEADER HOUSING ASSEMBLY CONTROL MODULE A.G.C. POWER SUPPLY 1003151 QTY 1
HEADER HOUSING CONTROL MODULE A.G.C. POWER SUPPLY 1004198 QTY 1
INSULATOR, WRAPOST-MALE, MINIATURE 1006775 QTY 35
CONTACT, WRAPOST-MALE, MINIATURE 1006782-5 QTY 35
INSULATOR PHOTOGRAPHIC MASTER CONTROL MODULE 1004217 QTY 1
INSULATOR PHOTOGRAPHIC MASTER CONTROL MODULE 1004218 QTY 1
INSULATOR PHOTOGRAPHIC MASTER CONTROL MODULE 1004219 QTY 1
WIRE, ELECTRICAL 1006787-2 QTY AR
INSULATION SLEEVING 1006776-20 AR 1006776-21 AR 1006776-22 AR QTY
INSULATOR, BUSHING 1008025-1 8 1008025-2 2 QTY
WIRE, ELECTRICAL 1006757-1 QTY AR

ELECTRICAL COMPONENTS	QTY
RESISTOR	
1006750-15	4
1006750-22	2
1006750-24	10
1006750-27	1
1006750-28	2
1006750-32	6
1006750-34	1
1006750-36	2
1006750-39	2
1006750-42	1
1006750-43	2
1006750-44	2
1006750-50	2
1006750-58	13
1006750-60	2
1006750-62	2
1006750-70	1
1006750-75	2
RESISTOR	
1006760-29	1
1006760-32	1
1006760-56	1
RESISTOR	
1010389-43	2
CAPACITOR	
1006755-134	2
1006755-26	2
1006755-57	2
1006755-64	2
CAPACITOR	
1006777-24	2
CAPACITOR	
1006793-30	2
DIODE	
1006701	2
DIODE	
1006751	14
DIODE	
1006838	7
TRANSISTOR	
1006752	6
TRANSISTOR	
1006753	2
TRANSISTOR	
1006829	2
TRANSISTOR	
1010376-1	6
RELAY	
1006815-2	1
RESISTOR 1006750-32 THRU 1006750-44 NOMINAL TO BE SELECTED AT ELECTRICAL TEST	3

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 30Oct63

NOTES
1 INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2 AR DENOTES AS REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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MIT APPROVAL 3Oct63

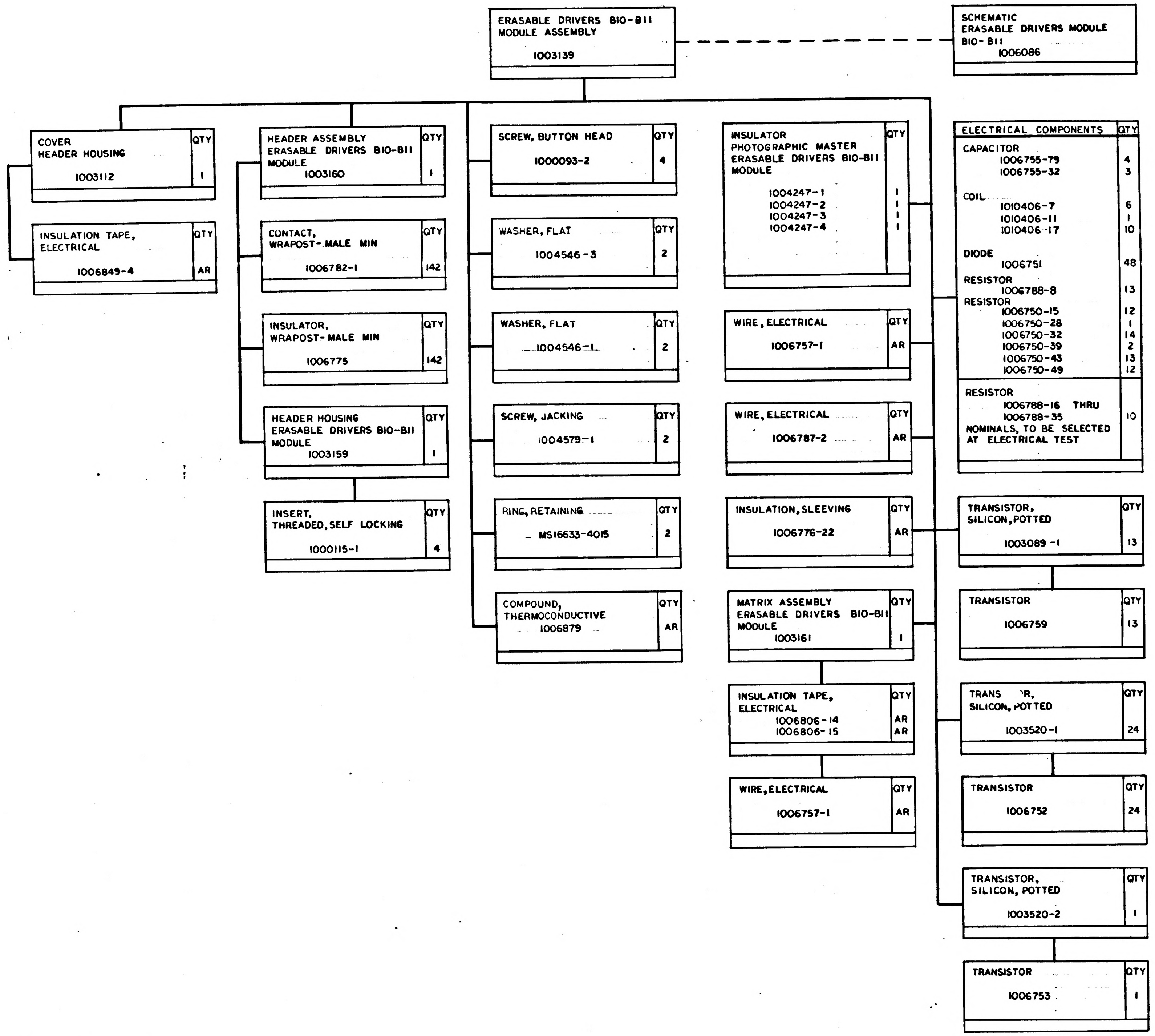
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL MODULE B12
AGC POWER SUPPLY
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006212
SCALE
WT
SHEET OF

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 05110		


ERASABLE DRIVERS BIO-BII MODULE ASSEMBLY
1003139
SCHEMATIC ERASABLE DRIVERS MODULE BIO-BII
1006086
COVER HEADER HOUSING
1003112
QTY 1
INSULATION TAPE, ELECTRICAL
1006849-4
QTY AR
HEADER ASSEMBLY ERASABLE DRIVERS BIO-BII MODULE
1003160
QTY 1
CONTACT, WRAPOST-MALE MIN
1006782-1
QTY 142
INSULATOR, WRAPOST-MALE MIN
1006775
QTY 142
HEADER HOUSING ERASABLE DRIVERS BIO-BII MODULE
1003159
QTY 1
INSERT, THREADED, SELF LOCKING
1000115-1
QTY 4
SCREW, BUTTON HEAD
1000093-2
QTY 4
WASHER, FLAT
1004546-3
QTY 2
WASHER, FLAT
1004546-1
QTY 2
SCREW, JACKING
1004579-1
QTY 2
RING, RETAINING
MS16633-4015
QTY 2
COMPOUND, THERMOCONDUCTIVE
1006879
QTY AR
INSULATOR PHOTOGRAPHIC MASTER ERASABLE DRIVERS BIO-BII MODULE
1004247-1 1
1004247-2 1
1004247-3 1
1004247-4 1
QTY
WIRE, ELECTRICAL
1006757-1
QTY AR
WIRE, ELECTRICAL
1006787-2
QTY AR
INSULATION, SLEEVING
1006776-22
QTY AR
MATRIX ASSEMBLY ERASABLE DRIVERS BIO-BII MODULE
1003161
QTY 1
INSULATION TAPE, ELECTRICAL
1006806-14 AR
1006806-15 AR
QTY
WIRE, ELECTRICAL
1006757-1
QTY AR
ELECTRICAL COMPONENTS
QTY
CAPACITOR
1006755-79 4
1006755-32 3
COIL
1010406-7 6
1010406-11 1
1010406-17 10
DIODE
1006751 48
RESISTOR
1006788-8 13
RESISTOR
1006750-15 12
1006750-28 1
1006750-32 14
1006750-39 2
1006750-43 13
1006750-49 12
RESISTOR
1006788-16 THRU 1006788-35 10
NOMINALS, TO BE SELECTED AT ELECTRICAL TEST
TRANSISTOR, SILICON, POTTED
1003089-1
QTY 13
TRANSISTOR
1006759
QTY 13
TRANSISTOR, SILICON, POTTED
1003520-1
QTY 24
TRANSISTOR
1006752
QTY 24
TRANSISTOR, SILICON, POTTED
1003520-2
QTY 1
TRANSISTOR
1006753
QTY 1

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 03623 DATE 30-8-63

NOTES:
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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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MIT APPROVAL 30-8-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ERASABLE DRIVERS
BIO-BII MODULE
FAMILY TREE

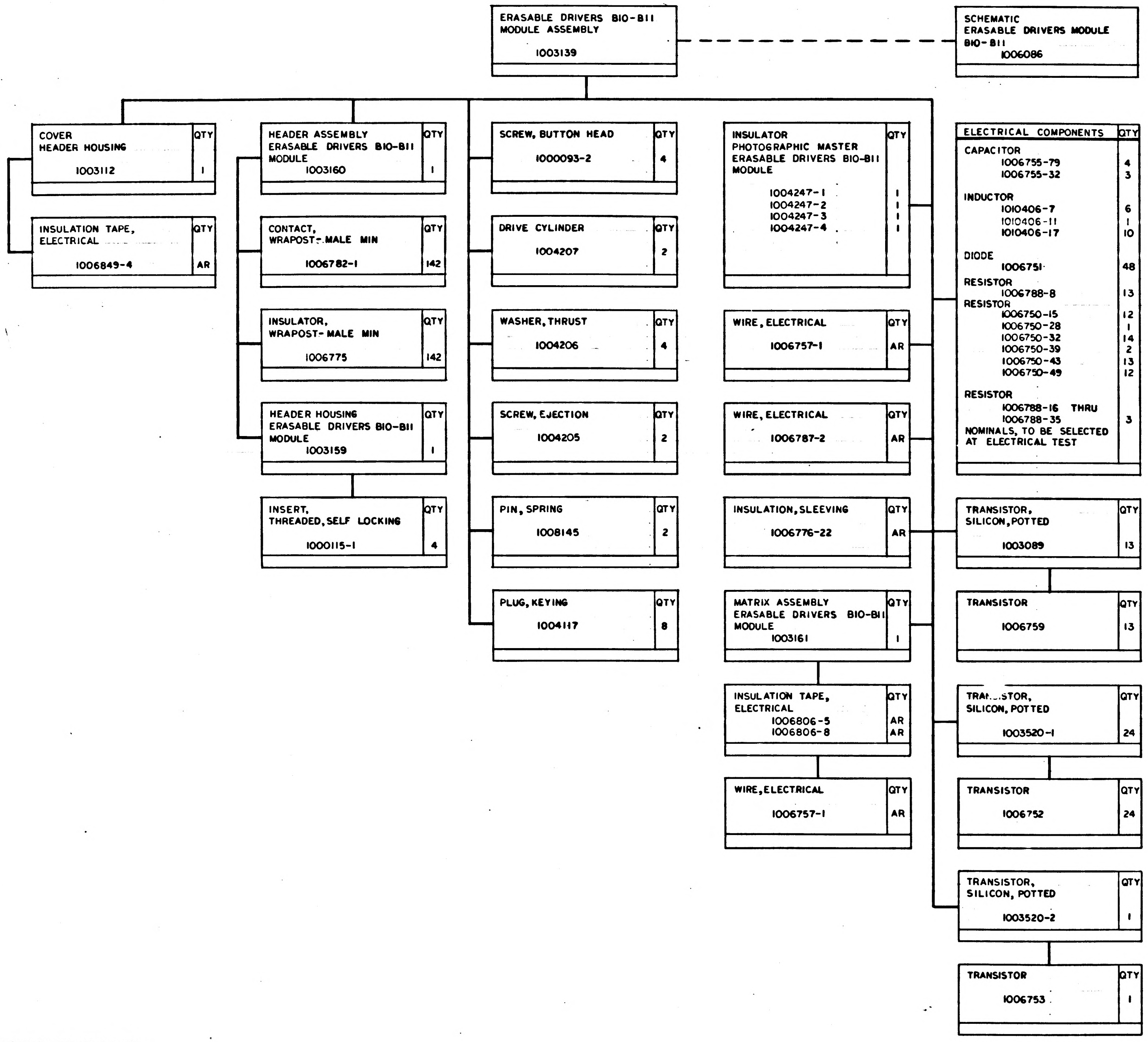
CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006213
SCALE
WT
SHEET OF

1006213 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL


ERASABLE DRIVERS B10-B11 MODULE ASSEMBLY 1003139
SCHEMATIC ERASABLE DRIVERS MODULE B10-B11 1006086
COVER HEADER HOUSING 1003112 QTY 1
INSULATION TAPE, ELECTRICAL 1006849-4 QTY AR
HEADER ASSEMBLY ERASABLE DRIVERS B10-B11 MODULE 1003160 QTY 1
CONTACT, WRAPOST-MALE MIN 1006782-1 QTY 142
INSULATOR, WRAPOST-MALE MIN 1006775 QTY 142
HEADER HOUSING ERASABLE DRIVERS B10-B11 MODULE 1003159 QTY 1
INSERT, THREADED, SELF LOCKING 1000115-1 QTY 4
SCREW, BUTTON HEAD 1000093-2 QTY 4
DRIVE CYLINDER 1004207 QTY 2
WASHER, THRUST 1004206 QTY 4
SCREW, EJECTION 1004205 QTY 2
PIN, SPRING 1008145 QTY 2
PLUG, KEYING 1004117 QTY 8
INSULATOR PHOTOGRAPHIC MASTER ERASABLE DRIVERS B10-B11 MODULE QTY
1004247-1 1
1004247-2 1
1004247-3 1
1004247-4 1
WIRE, ELECTRICAL 1006757-1 QTY AR
WIRE, ELECTRICAL 1006787-2 QTY AR
INSULATION, SLEEVING 1006776-22 QTY AR
MATRIX ASSEMBLY ERASABLE DRIVERS B10-B11 MODULE 1003161 QTY 1
INSULATION TAPE, ELECTRICAL QTY
1006806-5 AR
1006806-8 AR
WIRE, ELECTRICAL 1006757-1 QTY AR
ELECTRICAL COMPONENTS QTY
CAPACITOR
1006755-79 4
1006755-32 3
INDUCTOR
1010406-7 6
1010406-11 1
1010406-17 10
DIODE
1006751 48
RESISTOR
1006788-8 13
RESISTOR
1006750-15 12
1006750-28 1
1006750-32 14
1006750-39 2
1006750-43 13
1006750-49 12
RESISTOR
1006788-16 THRU 1006788-35 3
NOMINALS, TO BE SELECTED AT ELECTRICAL TEST
TRANSISTOR, SILICON, POTTED 1003089 QTY 13
TRANSISTOR 1006759 QTY 13
TRAN..STOR, SILICON, POTTED 1003520-1 QTY 24
TRANSISTOR 1006752 QTY 24
TRANSISTOR, SILICON, POTTED 1003520-2 QTY 1
TRANSISTOR 1006753 QTY 1

NOTES:
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CLASS B RELEASE TDR No. 03623 DATE 30-8-63

1006213

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LIST OF MATERIALS

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MIT APPROVAL 30-8-63

MANNED SPACECRAFT CENTER
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ERASABLE DRIVERS
B10-B11 MODULE
FAMILY TREE

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006213
SCALE | WT | SHEET OF

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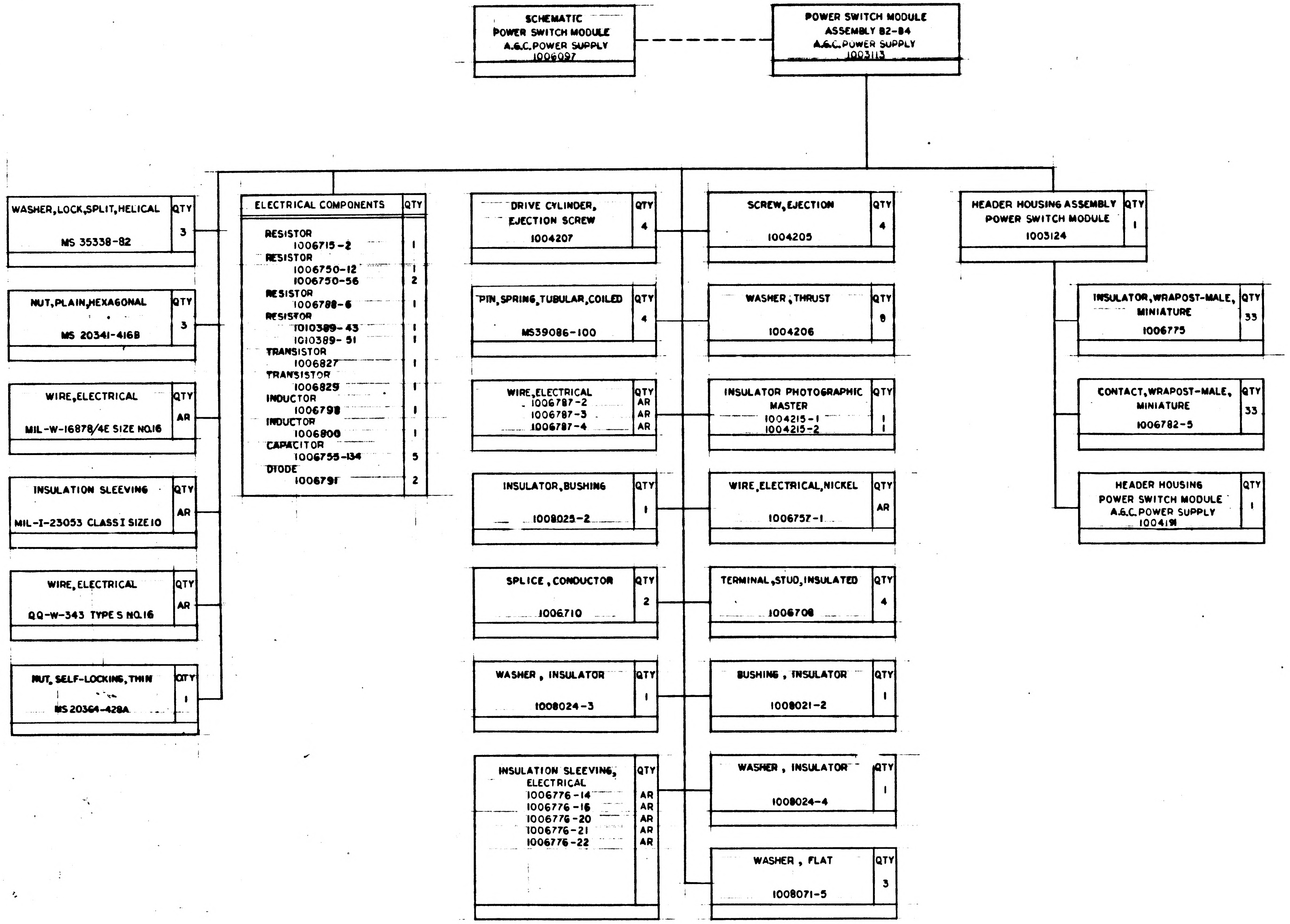
REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL


SCHEMATIC
POWER SWITCH MODULE
A.G.C. POWER SUPPLY
1006097
POWER SWITCH MODULE
ASSEMBLY B2-B4
A.G.C. POWER SUPPLY
1003113
WASHER, LOCK, SPLIT, HELICAL
MS 35338-82
QTY 3
NUT, PLAIN, HEXAGONAL
MS 20341-416B
QTY 3
WIRE, ELECTRICAL
MIL-W-16878/4E SIZE NO.16
QTY AR
INSULATION SLEEVING
MIL-I-23053 CLASS I SIZE 10
QTY AR
WIRE, ELECTRICAL
QQ-W-343 TYPE S NO.16
QTY AR
NUT, SELF-LOCKING, THIN
MS 20364-428A
QTY 1
ELECTRICAL COMPONENTS
QTY
RESISTOR
1006715-2 1
RESISTOR
1006750-12 1
1006750-56 2
RESISTOR
1006788-6 1
RESISTOR
1010389-43 1
1010389-51 1
TRANSISTOR
1006827 1
TRANSISTOR
1006829 1
INDUCTOR
1006798 1
INDUCTOR
1006800 1
CAPACITOR
1006755-134 5
DIODE
1006791 2
DRIVE CYLINDER, EJECTION SCREW
1004207
QTY 4
PIN, SPRING, TUBULAR, COILED
MS39086-100
QTY 4
WIRE, ELECTRICAL
1006787-2 AR
1006787-3 AR
1006787-4 AR
INSULATOR, BUSHING
1008025-2
QTY 1
SPLICE, CONDUCTOR
1006710
QTY 2
WASHER, INSULATOR
1008024-3
QTY 1
INSULATION SLEEVING, ELECTRICAL
1006776-14 AR
1006776-16 AR
1006776-20 AR
1006776-21 AR
1006776-22 AR
SCREW, EJECTION
1004205
QTY 4
WASHER, THRUST
1004206
QTY 8
INSULATOR PHOTOGRAPHIC MASTER
1004215-1 1
1004215-2 1
WIRE, ELECTRICAL, NICKEL
1006757-1
QTY AR
TERMINAL, STUD, INSULATED
1006708
QTY 4
BUSHING, INSULATOR
1008021-2
QTY 1
WASHER, INSULATOR
1008024-4
QTY 1
WASHER, FLAT
1008071-5
QTY 3
HEADER HOUSING ASSEMBLY
POWER SWITCH MODULE
1003124
QTY 1
INSULATOR, WRAPOST-MALE, MINIATURE
1006775
QTY 33
CONTACT, WRAPOST-MALE, MINIATURE
1006782-5
QTY 33
HEADER HOUSING
POWER SWITCH MODULE
A.G.C. POWER SUPPLY
1004191
QTY 1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 3 Oct 63

NOTES
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LIST OF MATERIALS

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APPLICATION	

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DRAWN Ed Powers DATE 1 Oct 63
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APPROVAL
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NASA APPROVAL W. J. Rhine 10-3-63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
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POWER SWITCH MODULE
B2-B4
FAMILY TREE

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006214
SCALE WT SHEET 1 OF 1

1006214

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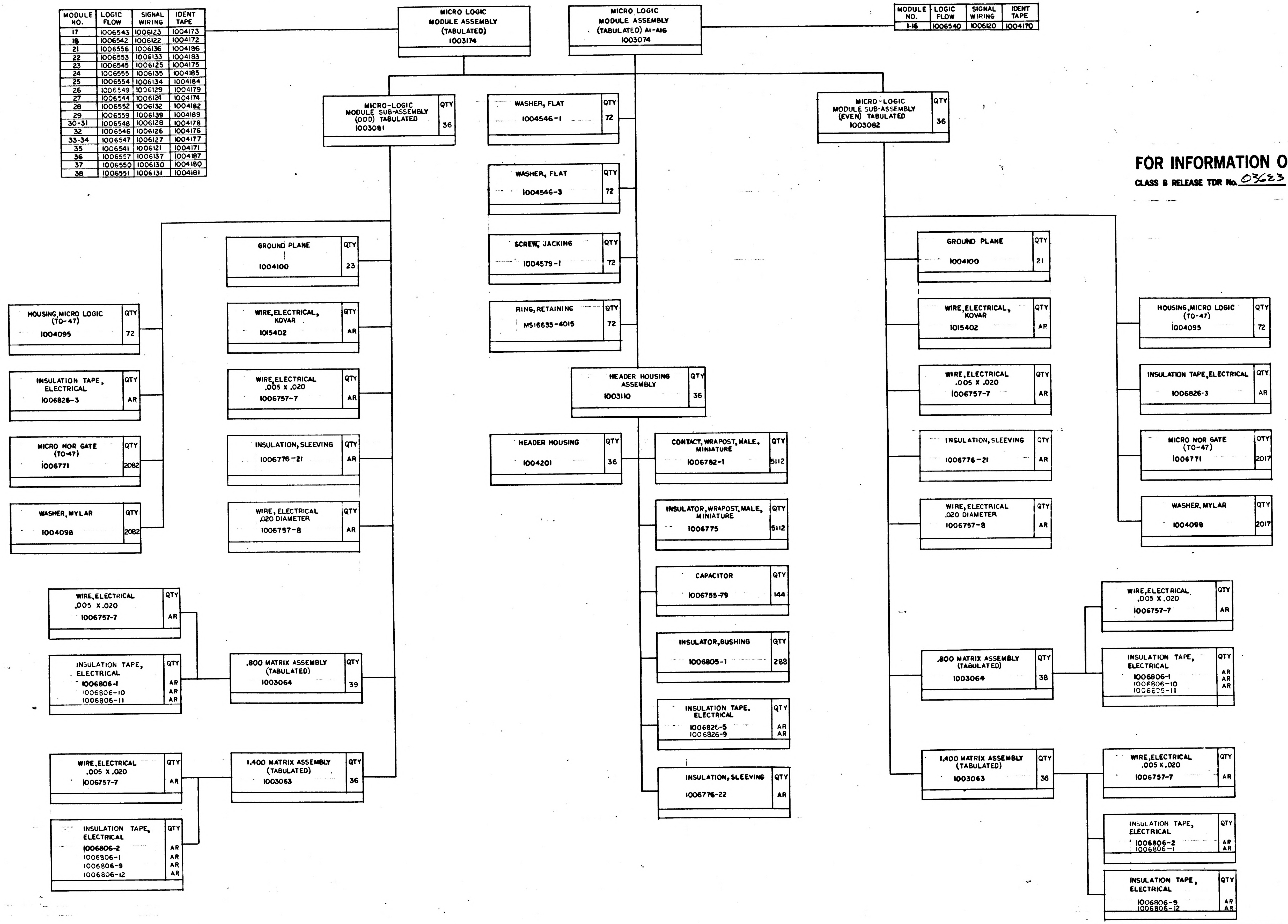
REVISIONS 03623			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 05110		

MODULE NO.	LOGIC FLOW	SIGNAL WIRING	IDENT TAPE
17	1006543	1006123	1004173
18	1006542	1006122	1004172
21	1006556	1006136	1004186
22	1006553	1006133	1004183
23	1006545	1006125	1004175
24	1006555	1006135	1004185
25	1006554	1006134	1004184
26	1006549	1006129	1004179
27	1006544	1006124	1004174
28	1006552	1006132	1004182
29	1006559	1006139	1004189
30-31	1006548	1006128	1004178
32	1006546	1006126	1004176
33-34	1006547	1006127	1004177
35	1006541	1006121	1004171
36	1006557	1006137	1004187
37	1006550	1006130	1004180
38	1006551	1006131	1004181

MODULE NO.	LOGIC FLOW	SIGNAL WIRING	IDENT TAPE
1-16	1006540	1006120	1004170


MICRO LOGIC MODULE ASSEMBLY (TABULATED) 1003174
MICRO LOGIC MODULE ASSEMBLY (TABULATED) A1-A16 1003074
MICRO-LOGIC MODULE SUB-ASSEMBLY (ODD) TABULATED 1003081 QTY 36
WASHER, FLAT 1004546-1 QTY 72
WASHER, FLAT 1004546-3 QTY 72
SCREW, JACKING 1004579-1 QTY 72
RING, RETAINING MS16633-4015 QTY 72
MICRO-LOGIC MODULE SUB-ASSEMBLY (EVEN) TABULATED 1003082 QTY 36
GROUND PLANE 1004100 QTY 23
WIRE, ELECTRICAL, KOVAR 1015402 QTY AR
WIRE, ELECTRICAL .005 X .020 1006757-7 QTY AR
INSULATION, SLEEVING 1006776-21 QTY AR
WIRE, ELECTRICAL .020 DIAMETER 1006757-8 QTY AR
HOUSING, MICRO LOGIC (TO-47) 1004095 QTY 72
INSULATION TAPE, ELECTRICAL 1006826-3 QTY AR
MICRO NOR GATE (TO-47) 1006771 QTY 2082
WASHER, MYLAR 1004098 QTY 2082
.800 MATRIX ASSEMBLY (TABULATED) 1003064 QTY 39
WIRE, ELECTRICAL .005 X .020 1006757-7 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-1 1006806-10 1006806-11 QTY AR AR AR
1.400 MATRIX ASSEMBLY (TABULATED) 1003063 QTY 36
WIRE, ELECTRICAL .005 X .020 1006757-7 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-2 1006806-1 1006806-9 1006806-12 QTY AR AR AR AR
HEADER HOUSING ASSEMBLY 1003110 QTY 36
HEADER HOUSING 1004201 QTY 36
CONTACT, WRAPOST, MALE, MINIATURE 1006782-1 QTY 5112
INSULATOR, WRAPOST, MALE, MINIATURE 1006775 QTY 5112
CAPACITOR 1006755-79 QTY 144
INSULATOR, BUSHING 1006805-1 QTY 288
INSULATION TAPE, ELECTRICAL 1006826-5 1006826-9 QTY AR AR
INSULATION, SLEEVING 1006776-22 QTY AR
GROUND PLANE 1004100 QTY 21
WIRE, ELECTRICAL, KOVAR 1015402 QTY AR
WIRE, ELECTRICAL .005 X .020 1006757-7 QTY AR
INSULATION, SLEEVING 1006776-21 QTY AR
WIRE, ELECTRICAL .020 DIAMETER 1006757-8 QTY AR
HOUSING, MICRO LOGIC (TO-47) 1004095 QTY 72
INSULATION TAPE, ELECTRICAL 1006826-3 QTY AR
MICRO NOR GATE (TO-47) 1006771 QTY 2017
WASHER, MYLAR 1004098 QTY 2017
.800 MATRIX ASSEMBLY (TABULATED) 1003064 QTY 38
WIRE, ELECTRICAL .005 X .020 1006757-7 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-1 1006806-10 1006806-11 QTY AR AR AR
1.400 MATRIX ASSEMBLY (TABULATED) 1003063 QTY 36
WIRE, ELECTRICAL .005 X .020 1006757-7 QTY AR
INSULATION TAPE, ELECTRICAL 1006806-2 1006806-1 QTY AR AR
INSULATION TAPE, ELECTRICAL 1006806-9 1006806-12 QTY AR AR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 30-8-63

NOTES:

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
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FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN H. Horn DATE 10-1-63
CHECKED C. Beaton 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL W. J. Rhine 10-3-63
MIT APPROVAL 30-8-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO LOGIC MODULE
FAMILY TREE

CODE IDENT NO. — SIZE E NASA DRAWING NO. 1006215
SCALE NONE WT SHEET 1 OF 1

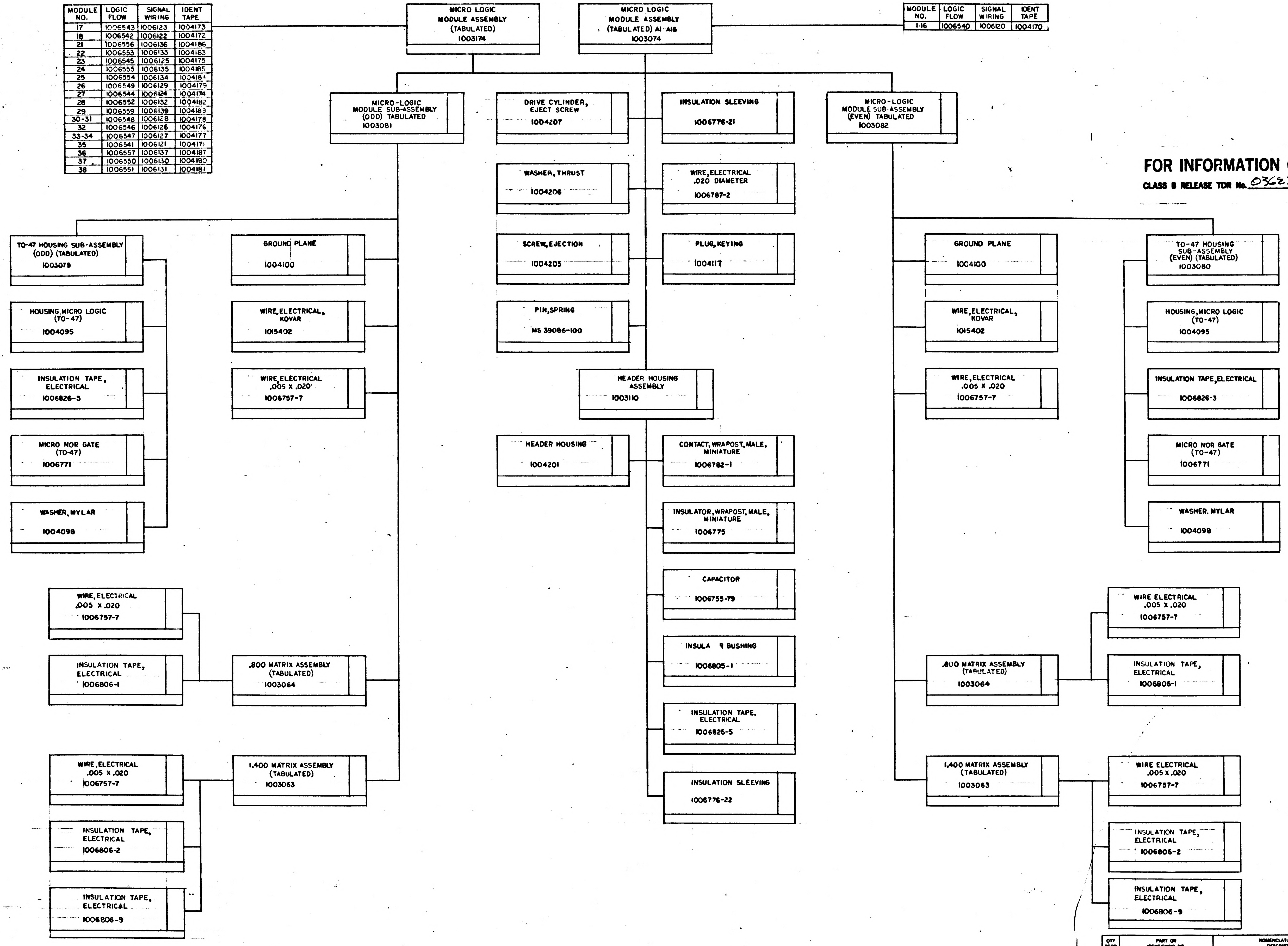
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 03623

SYM	DESCRIPTION	DATE	APPROVAL

MODULE NO.	LOGIC FLOW	SIGNAL WIRING	IDENT TAPE
17	1006543	1006123	1004173
18	1006542	1006122	1004172
21	1006556	1006136	1004186
22	1006553	1006133	1004183
23	1006545	1006125	1004175
24	1006555	1006135	1004185
25	1006554	1006134	1004184
26	1006549	1006129	1004179
27	1006544	1006124	1004174
28	1006552	1006132	1004182
29	1006559	1006139	1004189
30-31	1006548	1006128	1004178
32	1006546	1006126	1004176
33-34	1006547	1006127	1004177
35	1006541	1006121	1004171
36	1006557	1006137	1004187
37	1006550	1006130	1004180
38	1006551	1006131	1004181

MODULE NO.	LOGIC FLOW	SIGNAL WIRING	IDENT TAPE
1-16	1006540	1006120	1004170


MICRO LOGIC MODULE ASSEMBLY (TABULATED) 1003174
MICRO LOGIC MODULE ASSEMBLY (TABULATED) A1-A16 1003074
MICRO-LOGIC MODULE SUB-ASSEMBLY (ODD) TABULATED 1003081
DRIVE CYLINDER, EJECT SCREW 1004207
INSULATION SLEEVING 1006776-21
MICRO-LOGIC MODULE SUB-ASSEMBLY (EVEN) TABULATED 1003082
WASHER, THRUST 1004206
WIRE, ELECTRICAL .020 DIAMETER 1006787-2
SCREW, EJECTION 1004205
PLUG, KEYING 1004117
PIN, SPRING MS 39086-100
HEADER HOUSING ASSEMBLY 1003110
HEADER HOUSING 1004201
CONTACT, WRAPOST, MALE, MINIATURE 1006782-1
INSULATOR, WRAPOST, MALE, MINIATURE 1006775
CAPACITOR 1006755-79
INSULATOR BUSHING 1006805-1
INSULATION TAPE, ELECTRICAL 1006826-5
INSULATION SLEEVING 1006776-22
TO-47 HOUSING SUB-ASSEMBLY (ODD) (TABULATED) 1003079
HOUSING, MICRO LOGIC (TO-47) 1004095
INSULATION TAPE, ELECTRICAL 1006826-3
MICRO NOR GATE (TO-47) 1006771
WASHER, MYLAR 1004098
GROUND PLANE 1004100
WIRE, ELECTRICAL, KOVAR 1015402
WIRE, ELECTRICAL .005 X .020 1006757-7
WIRE, ELECTRICAL .005 X .020 1006757-7
INSULATION TAPE, ELECTRICAL 1006806-1
.800 MATRIX ASSEMBLY (TABULATED) 1003064
WIRE, ELECTRICAL .005 X .020 1006757-7
1.400 MATRIX ASSEMBLY (TABULATED) 1003063
INSULATION TAPE, ELECTRICAL 1006806-2
INSULATION TAPE, ELECTRICAL 1006806-9
GROUND PLANE 1004100
WIRE, ELECTRICAL, KOVAR 1015402
WIRE, ELECTRICAL .005 X .020 1006757-7
TO-47 HOUSING SUB-ASSEMBLY (EVEN) (TABULATED) 1003080
HOUSING, MICRO LOGIC (TO-47) 1004095
INSULATION TAPE, ELECTRICAL 1006826-3
MICRO NOR GATE (TO-47) 1006771
WASHER, MYLAR 1004098
WIRE ELECTRICAL .005 X .020 1006757-7
.800 MATRIX ASSEMBLY (TABULATED) 1003064
INSULATION TAPE, ELECTRICAL 1006806-1
1.400 MATRIX ASSEMBLY (TABULATED) 1003063
WIRE ELECTRICAL .005 X .020 1006757-7
INSULATION TAPE, ELECTRICAL 1006806-2
INSULATION TAPE, ELECTRICAL 1006806-9

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03623 DATE 30-8-63

NOTES:

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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DRAWN W. Horgan DATE 10-1-63
CHECKED C. A. Busta 10-3-63
APPROVAL
APPROVAL
NASA APPROVAL W. J. Rhine 10-3-63
MIT APPROVAL 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

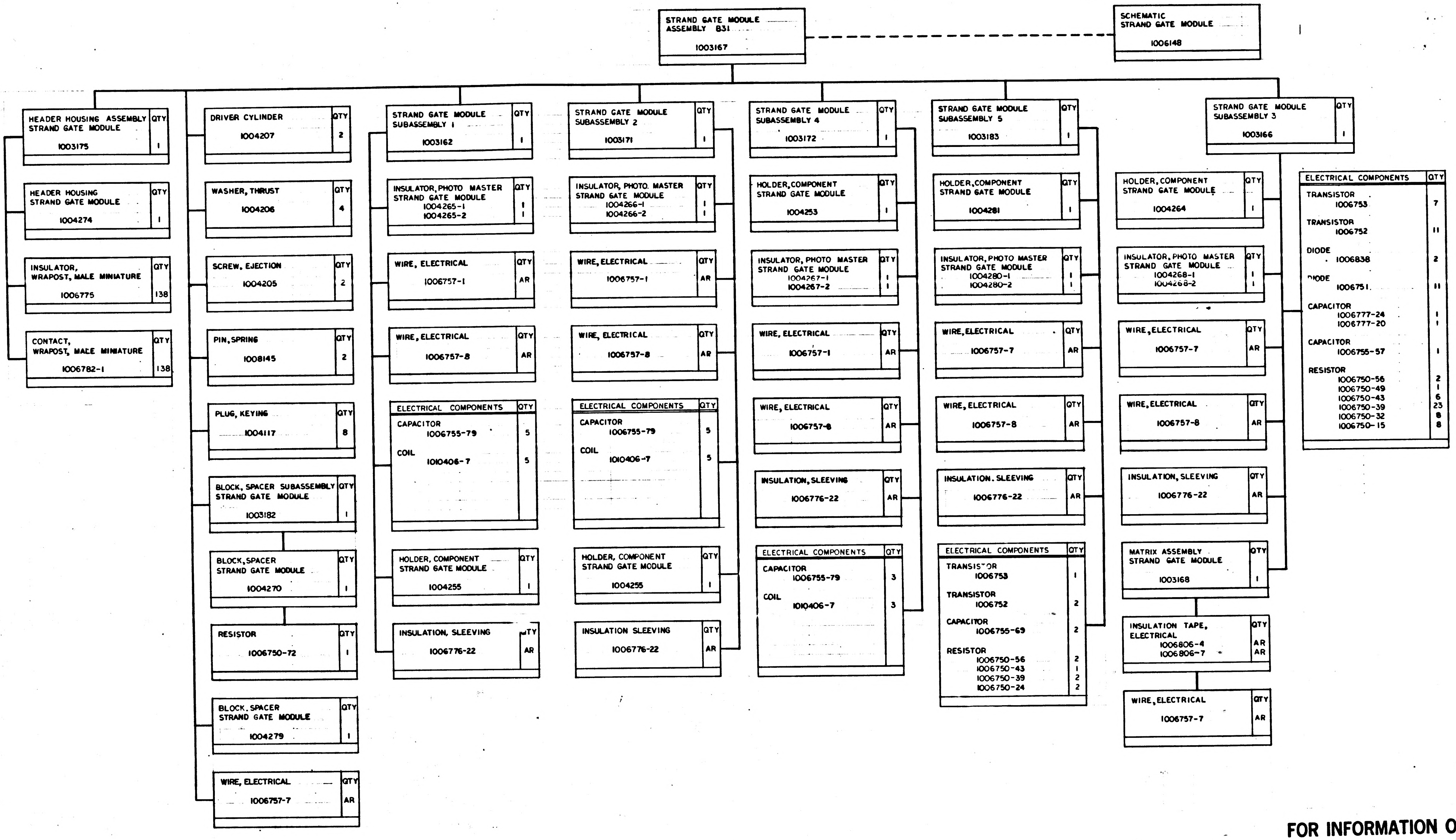
MICRO LOGIC MODULE
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006215
SCALE NONE WT SHEET 1 OF 1

1006215

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL



STRAND GATE MODULE ASSEMBLY B31 1003167
SCHEMATIC STRAND GATE MODULE 1006148
HEADER HOUSING ASSEMBLY STRAND GATE MODULE 1003175 QTY 1
HEADER HOUSING STRAND GATE MODULE 1004274 QTY 1
INSULATOR, WRAPOST, MALE MINIATURE 1006775 QTY 138
CONTACT, WRAPOST, MALE MINIATURE 1006782-1 QTY 138
DRIVER CYLINDER 1004207 QTY 2
WASHER, THRUST 1004206 QTY 4
SCREW, EJECTION 1004205 QTY 2
PIN, SPRING 1008145 QTY 2
PLUG, KEYING 1004117 QTY 8
BLOCK, SPACER SUBASSEMBLY STRAND GATE MODULE 1003182 QTY 1
BLOCK, SPACER STRAND GATE MODULE 1004270 QTY 1
RESISTOR 1006750-72 QTY 1
BLOCK, SPACER STRAND GATE MODULE 1004279 QTY 1
WIRE, ELECTRICAL 1006757-7 QTY AR
STRAND GATE MODULE SUBASSEMBLY 1 1003162 QTY 1
INSULATOR, PHOTO MASTER STRAND GATE MODULE 1004265-1 1004265-2 QTY 1 1
WIRE, ELECTRICAL 1006757-1 QTY AR
WIRE, ELECTRICAL 1006757-8 QTY AR
ELECTRICAL COMPONENTS QTY
CAPACITOR 1006755-79 5
COIL 1010406-7 5
HOLDER, COMPONENT STRAND GATE MODULE 1004255 QTY 1
INSULATION, SLEEVING 1006776-22 QTY AR
STRAND GATE MODULE SUBASSEMBLY 2 1003171 QTY 1
INSULATOR, PHOTO MASTER STRAND GATE MODULE 1004266-1 1004266-2 QTY 1 1
WIRE, ELECTRICAL 1006757-1 QTY AR
WIRE, ELECTRICAL 1006757-8 QTY AR
ELECTRICAL COMPONENTS QTY
CAPACITOR 1006755-79 5
COIL 1010406-7 5
HOLDER, COMPONENT STRAND GATE MODULE 1004255 QTY 1
INSULATION SLEEVING 1006776-22 QTY AR
STRAND GATE MODULE SUBASSEMBLY 4 1003172 QTY 1
HOLDER, COMPONENT STRAND GATE MODULE 1004253 QTY 1
INSULATOR, PHOTO MASTER STRAND GATE MODULE 1004267-1 1004267-2 QTY 1 1
WIRE, ELECTRICAL 1006757-1 QTY AR
WIRE, ELECTRICAL 1006757-8 QTY AR
INSULATION, SLEEVING 1006776-22 QTY AR
ELECTRICAL COMPONENTS QTY
CAPACITOR 1006755-79 3
COIL 1010406-7 3
STRAND GATE MODULE SUBASSEMBLY 5 1003183 QTY 1
HOLDER, COMPONENT STRAND GATE MODULE 1004281 QTY 1
INSULATOR, PHOTO MASTER STRAND GATE MODULE 1004280-1 1004280-2 QTY 1 1
WIRE, ELECTRICAL 1006757-7 QTY AR
WIRE, ELECTRICAL 1006757-8 QTY AR
INSULATION. SLEEVING 1006776-22 QTY AR
ELECTRICAL COMPONENTS QTY
TRANSISTOR 1006753 1
TRANSISTOR 1006752 2
CAPACITOR 1006755-69 2
RESISTOR 1006750-56 2
1006750-43 1
1006750-39 2
1006750-24 2
STRAND GATE MODULE SUBASSEMBLY 3 1003166 QTY 1
HOLDER, COMPONENT STRAND GATE MODULE 1004264 QTY 1
INSULATOR, PHOTO MASTER STRAND GATE MODULE 1004268-1 1004268-2 QTY 1 1
WIRE, ELECTRICAL 1006757-7 QTY AR
WIRE, ELECTRICAL 1006757-8 QTY AR
INSULATION, SLEEVING 1006776-22 QTY AR
MATRIX ASSEMBLY STRAND GATE MODULE 1003168 QTY 1
INSULATION TAPE, ELECTRICAL 1006806-4 1006806-7 QTY AR AR
WIRE, ELECTRICAL 1006757-7 QTY AR
ELECTRICAL COMPONENTS QTY
TRANSISTOR 1006753 7
TRANSISTOR 1006752 11
DIODE 1006838 2
DIODE 1006751 11
CAPACITOR 1006777-24 1
1006777-20 1
CAPACITOR 1006755-57 1
RESISTOR 1006750-56 2
1006750-49 1
1006750-43 6
1006750-39 23
1006750-32 8
1006750-15 8

FOR INFORMATION ONLY

CLASS B RELEASE TDR No.________ DATE

1006216

NOTES:
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DRAWN DATE Oct 7, 63
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APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

STRAND GATE MODULE
ASSEMBLY B31
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006216
SCALE
WT
SHEET OF

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

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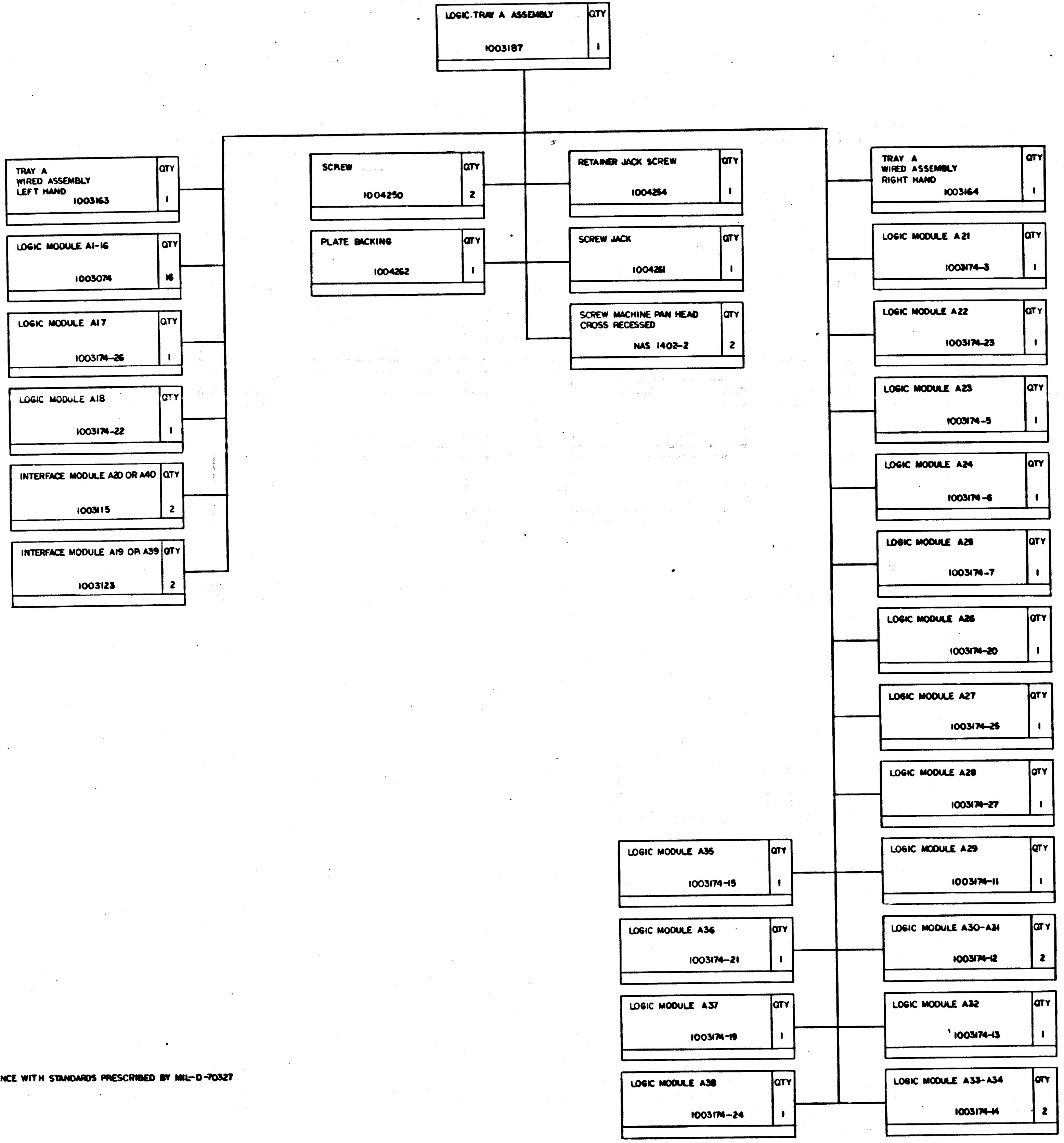
SYM	DESCRIPTION	DATE	APPROVAL

REVISIONS 05175


LOGIC TRAY A ASSEMBLY 1003187 QTY 1
TRAY A WIRED ASSEMBLY LEFT HAND 1003163 QTY 1
LOGIC MODULE A1-16 1003074 QTY 16
LOGIC MODULE A17 1003174-26 QTY 1
LOGIC MODULE A18 1003174-22 QTY 1
INTERFACE MODULE A20 OR A40 1003115 QTY 2
INTERFACE MODULE A19 OR A39 1003123 QTY 2
SCREW 1004250 QTY 2
PLATE BACKING 1004262 QTY 1
RETAINER JACK SCREW 1004254 QTY 1
SCREW JACK 1004261 QTY 1
SCREW MACHINE PAN HEAD CROSS RECESSED NAS 1402-2 QTY 2
TRAY A WIRED ASSEMBLY RIGHT HAND 1003164 QTY 1
LOGIC MODULE A21 1003174-3 QTY 1
LOGIC MODULE A22 1003174-23 QTY 1
LOGIC MODULE A23 1003174-5 QTY 1
LOGIC MODULE A24 1003174-6 QTY 1
LOGIC MODULE A25 1003174-7 QTY 1
LOGIC MODULE A26 1003174-20 QTY 1
LOGIC MODULE A27 1003174-25 QTY 1
LOGIC MODULE A28 1003174-27 QTY 1
LOGIC MODULE A29 1003174-11 QTY 1
LOGIC MODULE A30-A31 1003174-12 QTY 2
LOGIC MODULE A32 1003174-13 QTY 1
LOGIC MODULE A33-A34 1003174-14 QTY 2
LOGIC MODULE A35 1003174-15 QTY 1
LOGIC MODULE A36 1003174-21 QTY 1
LOGIC MODULE A37 1003174-19 QTY 1
LOGIC MODULE A38 1003174-24 QTY 1

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CLASS B RELEASE TDR No. 05175 DATE 12/17/63

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CAMBRIDGE, MASS
DWG NO
CONTRACT
DRAWN J. Crowley DATE 10-22-63
CHECKED
APPROVAL
APPROVAL R. J. Duggan 12-17-63
NASA APPROVAL 12/17/63
MIT APPROVAL 12/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRAY A ASSEMBLY
FAMILY TREE

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006217
SCALE
WT
SHEET 1 OF 1

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07657	4/14/64	
A	REVISED PER TDRR 10083 DR [illegible] CHK G. G. C. APPD J. Maynard	4/24/64	

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE MANUFACTURER'S NAME AND PART NUMBER. PACKAGING SHALL BE MARKED INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) MARKING: IN ACCORDANCE WITH NOTE 1B.

(2) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

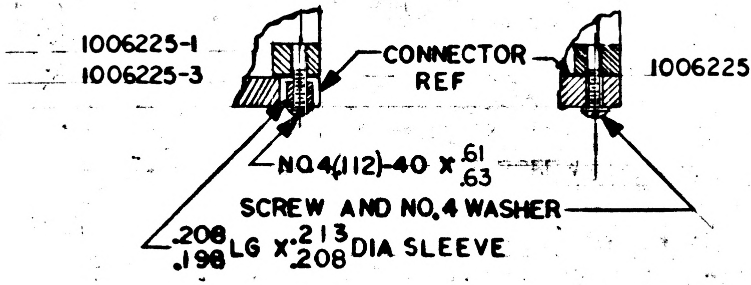
(3) DIMENSIONS: SEE VIEWS.

(4) HARDWARE: EACH UNIT SHALL BE SUPPLIED WITH HARDWARE INDICATED IN DETAIL A.

3. DESIGN:

A. MATERIAL: SHELL, CLAMP AND SLEEVES - ALUMINUM PER QQ-A-591, CADMIUM PLATED PER QQ-P-416, TYPE II, CLASS 3, OLIVE DRAB COLOR.
ENGAGING DEVICE - CRES PER QQ-S-763, CLASS 302 CONDITION A, OLIVE DRAB COLOR.
SCREWS AND WASHERS - STEEL CADMIUM PLATED PER QQ-P-416, TYPE II, CLASS 3
BUS BAR - BRASS PER QQ-B-626 1/2 HARD, HOT TIN DIPPED PER MIL-T-10727 TYPE II.
BUS BAR BUSHINGS AND RISER BLOCKS: NYLON PER MIL-P-17091

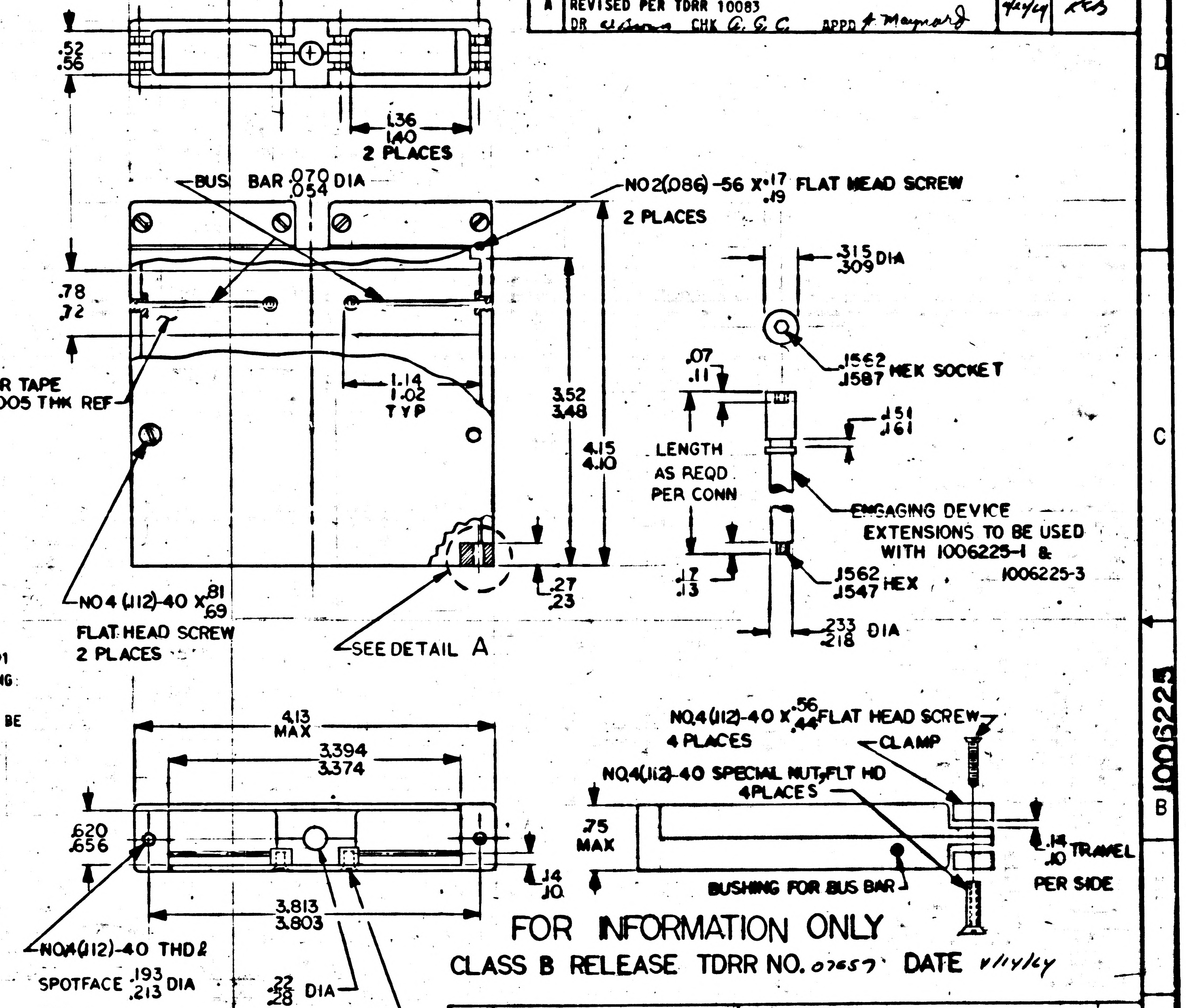
B. 1006225-1 SHALL BE DESIGNED FOR USE WITH CONNECTOR PER NASA DRAWING 1010641 AND 1006[illegible]. 1006225-2 SHALL BE DESIGNED FOR USE WITH CONNECTORS PER NASA DRAWINGS 1010642 AND 1006268. 1006225-3 SHALL BE DESIGNED FOR USE WITH CONNECTOR PER NASA DRAWING 1006269.


1006225-1
1006225-3
CONNECTOR REF
1006225-2
NO.4(.112)-40 X .61/.63
SCREW AND NO.4 WASHER
.208/.198 LG X .213/.208 DIA SLEEVE

DETAIL A

DASH NO.	
-1	WITH ENGAGING DEVICE TO FIT 1010641
-2	WITHOUT ENGAGING DEVICE
-3	WITH ENGAGING DEVICE TO FIT 1006269

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.


.52
.56
1.36
1.40
2 PLACES
BUS BAR .070/.054 DIA
NO2(.086)-56 X .17/.19 FLAT HEAD SCREW
2 PLACES
.78
.72
MYLAR TAPE .005 THK REF
1.14
1.02
TYP
3.52
3.48
4.15
4.10
.27
.23
NO4 (.112)-40 X .81/.69
FLAT HEAD SCREW
2 PLACES
SEE DETAIL A
.315/.309 DIA
.1562/.1587 HEX SOCKET
.07
.11
.151
.161
LENGTH AS REQD PER CONN
ENGAGING DEVICE EXTENSIONS TO BE USED WITH 1006225-1 & 1006225-3
.17
.13
.1562/.1547 HEX
.233/.218 DIA
4.13 MAX
3.394
3.374
.620
.656
3.813
3.803
.14
.10
NO.4(.112)-40 X .56/.44 FLAT HEAD SCREW
4 PLACES
CLAMP
NO.4(.112)-40 SPECIAL NUT, FLT HD
4 PLACES
.75 MAX
.14/.10 TRAVEL PER SIDE
BUSHING FOR BUS BAR
NO.4(.112)-40 THD & SPOTFACE .193/.213 DIA
.010/.020 DEEP 2 HOLES
.22/.28 DIA
NO.2 (.086)-56x .17/.19
FL HD SCR 2 PLACES

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CLASS B RELEASE TDRR NO. 07657 DATE 4/14/64

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SEE NOTE

HEAT TREATMENT

FINAL FINISH
SEE NOTE

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RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN JGD/S.T.[illegible] DATE 28 JAN 1964
CHECKED J. Walkowiez 13 FEB 64
APPROVAL [illegible]
APPROVAL J. O'Bryan
APPROVAL L.E. [illegible] 4/2/64
NASA APPROVAL A. C. [illegible] 4/14/64
MIT APPROVAL Charles [illegible]
MIT APPROVAL [illegible] 4/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SHELL, ELECTRICAL CONNECTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006225
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07657	4/14/64	
A	REVISED PER TDRR 10083 DR	4/20/64	KCB
B	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17082 DR J.P. Leonard CHK Caggiano APPD A. Maynard	4/11/65	KCB

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE MANUFACTURER'S NAME AND PART NUMBER. PACKAGING SHALL BE MARKED INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) MARKING: IN ACCORDANCE WITH NOTE 1B.

(2) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

(3) DIMENSIONS: SEE VIEWS.

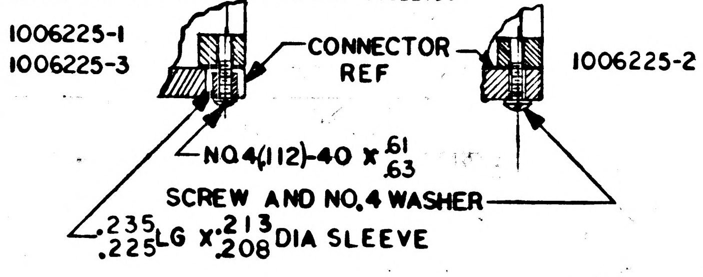
(4) HARDWARE: EACH UNIT SHALL BE SUPPLIED WITH HARDWARE INDICATED IN DETAIL A.

3. DESIGN:

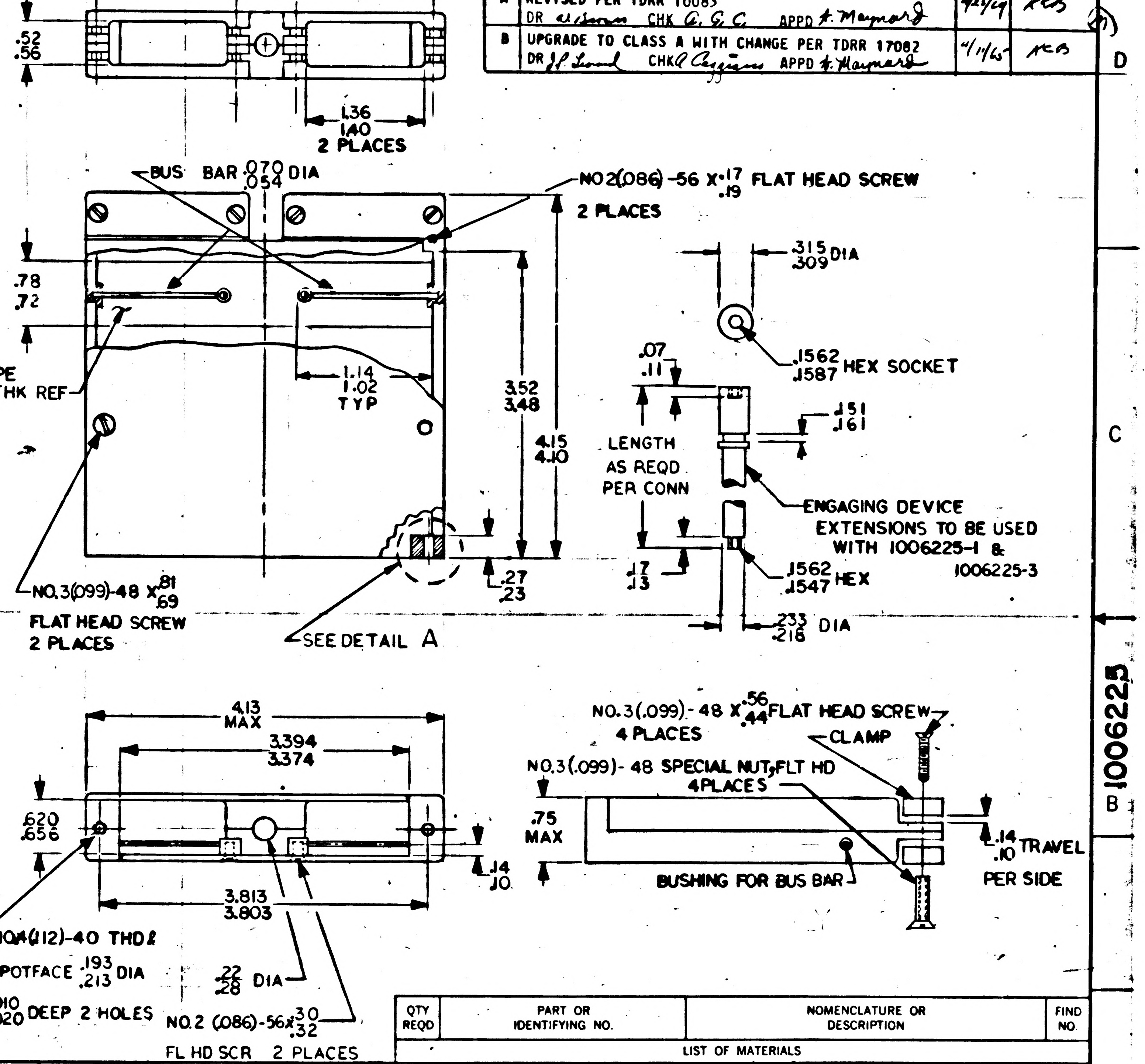
A. MATERIAL:
SHELL AND CLAMP - ALUMINUM PER QQ-A-591, CADMIUM PLATED PER QQ-P-416, TYPE II, CLASS 3, OLIVE DRAB COLOR.
ENGAGING DEVICE EXTENSION - CRES PER QQ-S-763, CLASS 302 CONDITION A,
SCREWS AND WASHERS - STEEL CADMIUM PLATED PER QQ-P-416, TYPE II, CLASS 3
BUS BAR - BRASS PER QQ-B-626 1/2 HARD, HOT TIN DIPPED PER MIL-T-10727 TYPE II.
SLEEVE BUSSBAR BUSHINGS AND RISER BLOCKS: NYLON PER MIL-P-17091

B. 1006225-1 SHALL BE DESIGNED FOR USE WITH CONNECTOR PER NASA DRAWING 1010815. 1006225-2 SHALL BE DESIGNED FOR USE WITH CONNECTORS PER NASA DRAWINGS 1010816 AND 1010817. 1006225-3 SHALL BE DESIGNED FOR USE WITH CONNECTOR PER NASA DRAWING 1010818

4. PREPARATION FOR DELIVERY PER ND 1002215.


1006225-1
1006225-3
CONNECTOR REF
1006225-2
NO.4(.112)-40 X .61 .63
SCREW AND NO.4 WASHER
.235 .225 LG X .213 .208 DIA SLEEVE

DETAIL A


.52
.56
.136
.140
2 PLACES
BUS BAR .070 .054 DIA
NO.2(.086)-56 X .17 .19 FLAT HEAD SCREW
2 PLACES
.78
.72
MYLAR TAPE
.005 THK REF
1.14
1.02
TYP
3.52
3.48
4.15
4.10
.27
.23
NO.3(.099)-48 X .81 .69
FLAT HEAD SCREW
2 PLACES
SEE DETAIL A
.315 .309 DIA
.07
.11
.1562 .1587 HEX SOCKET
.151
.161
LENGTH AS REQD PER CONN
ENGAGING DEVICE EXTENSIONS TO BE USED WITH 1006225-1 & 1006225-3
.17
.13
.1562 .1547 HEX
.233 .218 DIA
4.13 MAX
3.394
3.374
.620
.656
.14
.10
3.813
3.803
NO.4(.112)-40 THD & SPOTFACE .193 .213 DIA .010 .020 DEEP 2 HOLES
.22 .28 DIA
NO.2 (.086)-56 X .30 .32 FL HD SCR 2 PLACES
NO.3(.099)-48 X .56 .44 FLAT HEAD SCREW 4 PLACES
CLAMP
NO.3(.099)-48 SPECIAL NUT, FLT HD 4 PLACES
.75 MAX
.14 .10 TRAVEL PER SIDE
BUSHING FOR BUS BAR

DASH NO.	
-1	WITH ENGAGING DEVICE TO FIT 1010815
-2	WITHOUT ENGAGING DEVICE
-3	WITH ENGAGING DEVICE TO FIT 1010818

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J.D./S.T.Q. DATE 28 JAN 64
CHECKED J. Wolkowicz 13 FEB 64
APPROVAL
APPROVAL
APPROVAL 4/2/64
NASA APPROVAL 4/14/64
MIT APPROVAL Charles Sterling
MIT APPROVAL 4/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SHELL, ELECTRICAL CONNECTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006225
SCALE NONE WT SHEET 1 OF 1

1006225

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07657	4/14/64	

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE MANUFACTURER'S NAME AND PART NUMBER. PACKAGING SHALL BE MARKED INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) MARKING: IN ACCORDANCE WITH NOTE 1B.

(2) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

(3) DIMENSIONS: SEE VIEWS.

(4) HARDWARE: EACH UNIT SHALL BE SUPPLIED WITH HARDWARE INDICATED IN DETAIL A.

3. DESIGN:

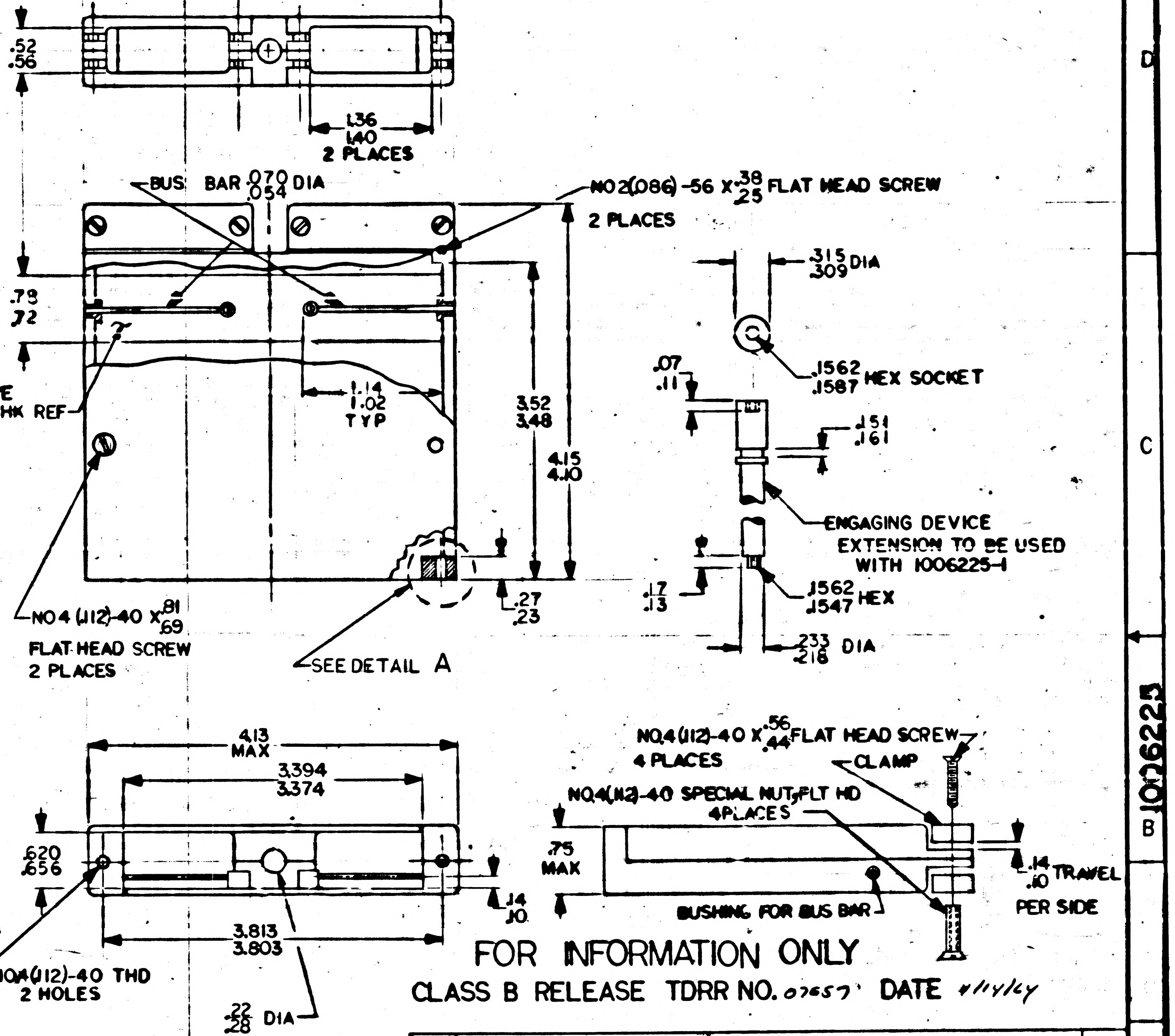
A. MATERIAL: SHELL, CLAMP AND SLEEVES – ALUMINUM PER QQ-A-591, CADMIUM PLATED PER QQ-P-416, TYPE II, CLASS 3, OLIVE DRAB COLOR.

ENGAGING DEVICE – SCREWS AND WASHERS – STEEL CADMIUM PLATED PER QQ-P-416, TYPE II, CLASS 3, OLIVE DRAB COLOR.

BUS BAR – BRASS PER QQ-B-626 1/2 HARD, HOT TIN DIPPED PER MIL-T-10727 TYPE II.

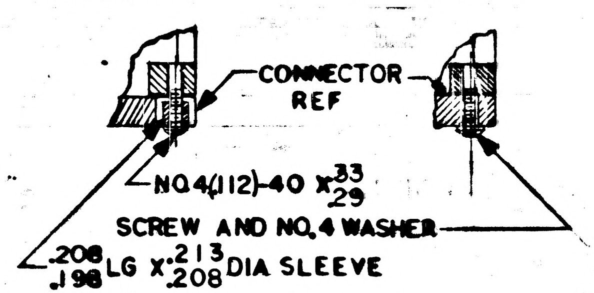
BUS BAR BUSHINGS AND RISER BLOCKS: NYLON PER MIL-P-17091

B. 1006225-1 SHALL BE DESIGNED FOR USE WITH CONNECTORS PER NASA DRAWINGS 1010641 AND 1006269. 1006225-2 SHALL BE DESIGNED FOR USE WITH CONNECTORS PER NASA DRAWINGS 1010642 AND 1006268.



.52
.56
.136
.140
2 PLACES
BUS BAR .070 .054 DIA
NO 2(.086)-56 X .38 .25 FLAT HEAD SCREW
2 PLACES
.315 .309 DIA
.78
.72
1.14
1.02
TYP
3.52
3.48
4.15
4.10
MYLAR TAPE
.005 THK REF
.07
.11
.1562
.1587 HEX SOCKET
.151
.161
ENGAGING DEVICE
EXTENSION TO BE USED WITH 1006225-1
.17
.13
.1562
.1547 HEX
.233
.218 DIA
.27
.23
NO 4 (.112)-40 X .81 .69
FLAT HEAD SCREW
2 PLACES
SEE DETAIL A
4.13
MAX
3.394
3.374
.620
.656
.14
.10
3.813
3.803
NO 4(.112)-40 THD
2 HOLES
.22
.28 DIA
NO 4(.112)-40 X .56 .44 FLAT HEAD SCREW
4 PLACES
CLAMP
NO 4(.112)-40 SPECIAL NUT, FLT HD
4 PLACES
.75
MAX
.14
.10 TRAVEL
PER SIDE
BUSHING FOR BUS BAR

1006225-1 1006225-2



CONNECTOR
REF
NO 4(.112)-40 X .33 .29
SCREW AND NO. 4 WASHER
.208
.198 LG X .213 .208 DIA SLEEVE

DETAIL A

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 07657 DATE 4/14/64

DASH NO.	
-1	WITH ENGAGING DEVICE
-2	WITHOUT ENGAGING DEVICE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN JBD/S.T.Q. DATE 28 JAN 64
CHECKED J. Wolfkowitz 13 FEB 64
APPROVAL
APPROVAL
APPROVAL RFB 4/2/64
NASA APPROVAL A. C. Metzger 4/14/64
MIT APPROVAL
MIT APPROVAL 4/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SHELL, ELECTRICAL CONNECTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006225
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006225

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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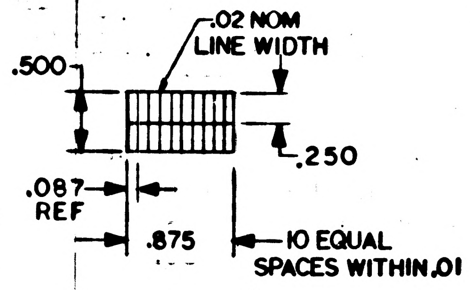
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07222		
A	REPLACED WITH CHANGE BY REV B PER TDRR 17079 DR. J.J. McDaniel CHK APPD	3/24/65	KEB

NOTES:

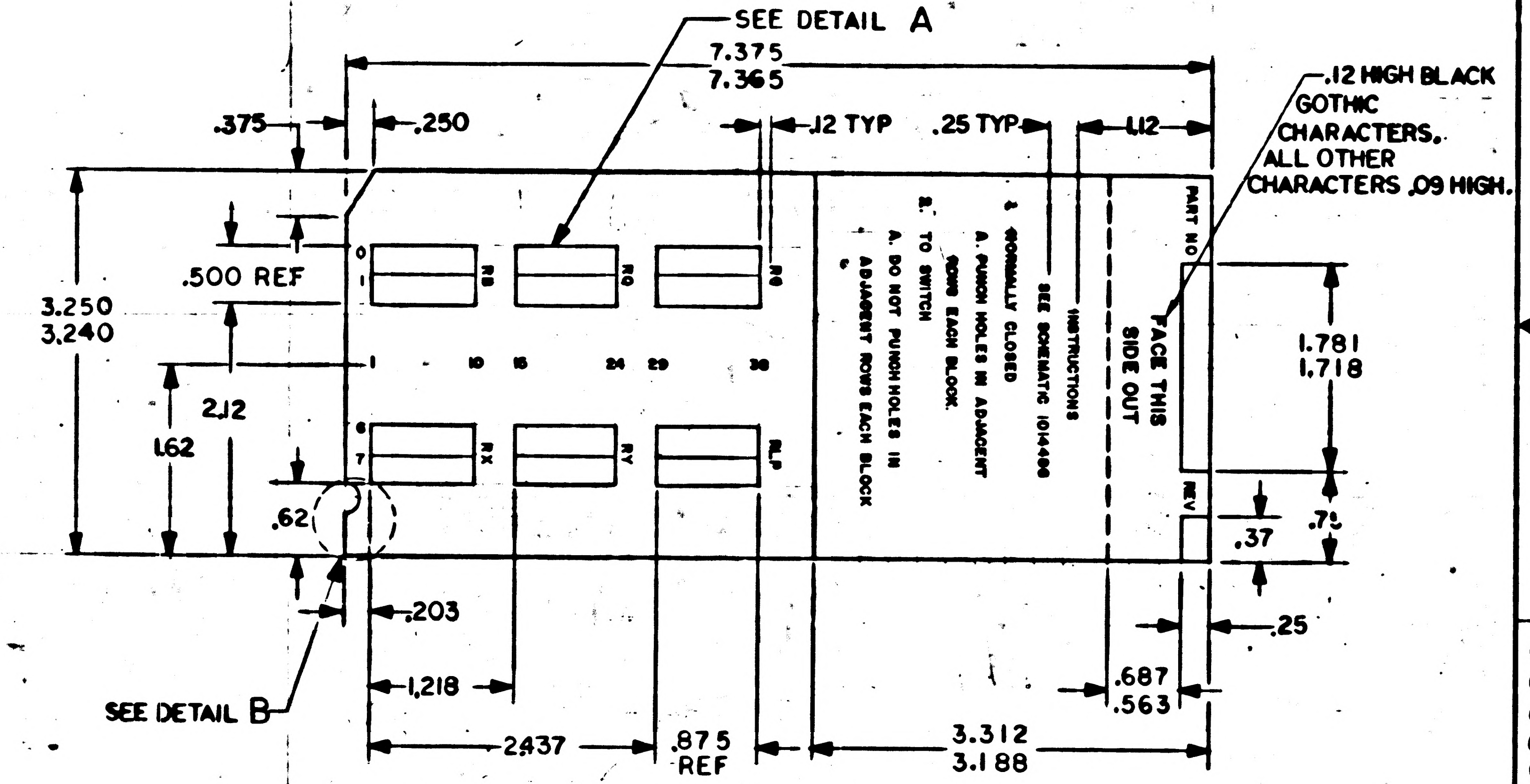
1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, NUMBER OF PARTS INCLUDED, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLE)
   - A. DIMENSIONS: AS DELINEATED.
   - B. MATERIAL: WHITE POLYVINYL CHLORIDE SHEET PER L-V-351, PRINTED AND BONDED WITH AN ACRYLIC ADHESIVE BETWEEN 2 LAYERS OF POLYETHYLENE TERAPHTHALATE FILM (MYLAR) CONFORMING TO MIL-I-631, TYPE G, FORM F, GRADE A, CLASS I. TOTAL THICKNESS 0.012 MAXIMUM. THIS REQUIREMENT SHALL BE CERTIFIED WITH EACH LOT SHIPPED.
   - C. FINISH AND APPEARANCE: THE CARDS SHALL HAVE NO ROUGH OR BURRED EDGES. THEY SHALL SHOW NO DELAMINATION OR BLISTERING ON THE EDGES NOR BLISTERING IN EXCESS OF 0.060 DIAMETER ANYWHERE. ALL CHARACTERS AND LINEWORK SHALL BE PRINTED ON THE MIDDLE STRATA AND SHALL BE SHARP AND LEGIBLE BEFORE AND AFTER LAMINATING.
   - D. PACKAGING: CARDS SHALL BE PACKAGED IN MOISTURE PROOF BAG, ENVELOPE, OR WRAPPING.
   - E. STRAIGHTNESS & PARALLELISM: EDGES WITHIN 0.003
3. DESIGN REQUIREMENTS:
   - A. STORAGE LIFE: 5 YEARS MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WITHOUT DELAMINATION OR CURLING MORE THAN 0.12.
   - B. AMBIENT TEMPERATURE RANGE: -40°F TO +140°F.

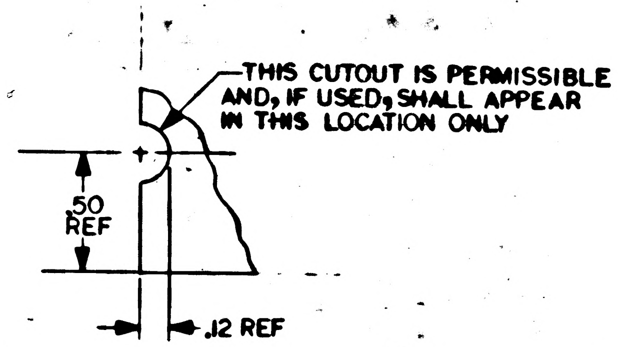

.02 NOM
LINE WIDTH
.500
.250
.087
REF
.875
10 EQUAL
SPACES WITHIN .01

DETAIL A
6 PLACES

FOR INFORMATION ONLY

CLASS B RELEASED TDRR NO. 7222 DATE


SEE DETAIL A
7.375
7.365
.375
.250
.12 TYP
.25 TYP
1.12
.12 HIGH BLACK GOTHIC CHARACTERS, ALL OTHER CHARACTERS .09 HIGH.
.500 REF
3.250
3.240
2.12
1.62
.62
0
1
6
7
R8
R9
R0
RX
RY
RLP
1
10
15
24
29
30
INSTRUCTIONS
SEE SCHEMATIC 1014400
1. NORMALLY CLOSED
A. PUNCH HOLES IN ADJACENT ROWS EACH BLOCK.
2. TO SWITCH
A. DO NOT PUNCH HOLES IN ADJACENT ROWS EACH BLOCK
FACE THIS SIDE OUT
PART NO
REV
1.781
1.718
.37
.75
.25
.687
.563
.203
1.218
2.437
.875
REF
3.312
3.188
SEE DETAIL B


THIS CUTOUT IS PERMISSIBLE AND, IF USED, SHALL APPEAR IN THIS LOCATION ONLY
.50
REF
.12 REF

DETAIL B

Ⓐ REPLACED WITH CHANGE BY REV B

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ±.03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 498
DRAWN J. La Porte DATE 4 FEB 64
CHECKED J. Walkowicz 14 FEB 64
APPROVAL 20 FEB 64
APPROVAL
APPROVAL L. E.
NASA APPROVAL A. C. Metzger
MIT APPROVAL 3/24/64
MIT APPROVAL C. Sparling 3/24/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD, TABULATING,
PLASTIC, PERMANENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ———
SIZE C
NASA DRAWING NO. 1006228
SCALE NONE
WT
SHEET 1 OF 1

1006228

1006228 B

REVISIONS			
SYM	DESCRIPTION 0722²	DATE	APPROVED
B	REPLACES REV A WITH CHANGE PER TDRR 17079	3/2/65	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, NUMBER OF PARTS INCLUDED, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLE)
   - A. DIMENSIONS: AS DELINEATED.
   - B. MATERIAL: SEE TABLE I.
     REQUIREMENTS LISTED IN TABLE I SHALL BE CERTIFIED WITH EACH LOT SHIPPED.
   - C. FINISH AND APPEARANCE:
     - (1) THE CARDS SHALL HAVE NO ROUGH OR BURRED EDGES.
     - (2) THEY SHALL SHOW NO DELAMINATION OR BLISTERING ON THE EDGES NOR BLISTERING IN EXCESS OF 0.060 DIAMETER ANYWHERE.
     - (3) ALL CHARACTERS AND LINEWORK SHALL BE PRINTED ON THE MIDDLE STRATA AND SHALL BE SHARP AND LEGIBLE BEFORE AND AFTER LAMINATING
   - D. PACKAGING: CARDS SHALL BE PACKAGED IN MOISTURE PROOF BAG, ENVELOPE, OR WRAPPING.
   - E. STRAIGHTNESS & PARALLELISM: EDGES WITHIN 0.003

3. DESIGN REQUIREMENTS:
   - A. STORAGE LIFE: 5 YEARS MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WITHOUT DELAMINATION OR CURLING MORE THAN 0.12.
   - B. AMBIENT TEMPERATURE RANGE: -40°F TO +140°F.

TABLE I

DASH NO.*	MATERIAL
-000	WHITE POLYVINYL CHLORIDE SHEET PER L-V-351, PRINTED & BONDED WITH AN ACRYLIC ADHESIVE BETWEEN 2 LAYERS OF POLYETHYLENE TERAPHTHALATE FILM (MYLAR) CONFORMING TO MIL-I-631 TYPE G, FORM F, GRADE A, CLASS 1. TOTAL THICKNESS 0.012 MAXIMUM
-001	IBM FORM U11897 OR EQUIVALENT

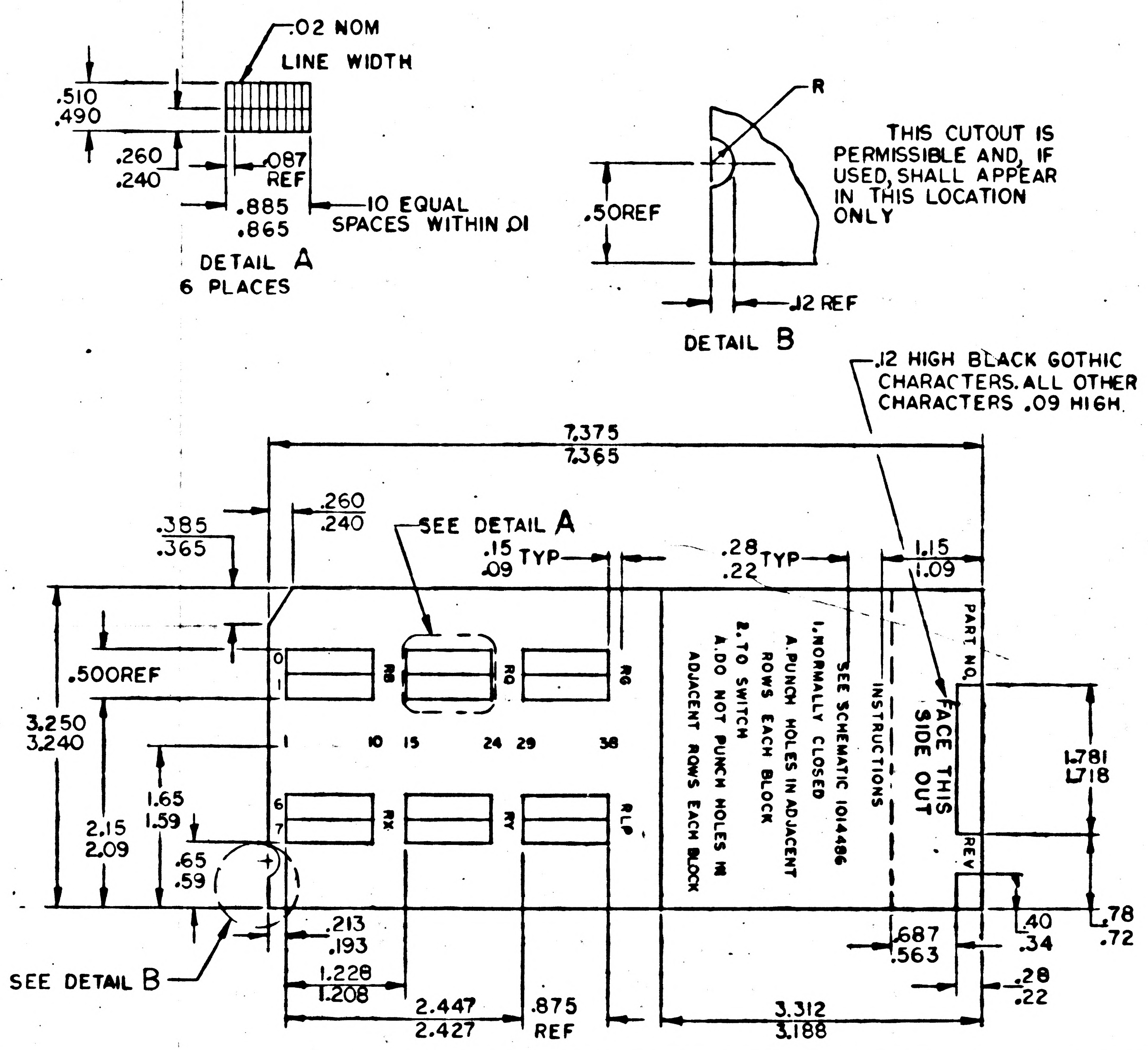
*ORIGINAL CONFIGURATION IDENTIFIED BY THE DWG NO. AND A -000 SUFFIX.

DASH NO.	APPLICABLE NOTES
-000	1, 2, 3
-001	1A, 1B, 2A, 2B, 2C1, 2D, 2E

NOTE APPLICATION

Ⓑ REPLACES REV A WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.


.02 NOM
LINE WIDTH
.510
.490
.260
.240
.087
REF
.885
.865
10 EQUAL SPACES WITHIN .01
DETAIL A
6 PLACES
R
THIS CUTOUT IS PERMISSIBLE AND, IF USED, SHALL APPEAR IN THIS LOCATION ONLY
.50REF
.12 REF
DETAIL B
.12 HIGH BLACK GOTHIC CHARACTERS. ALL OTHER CHARACTERS .09 HIGH.
7.375
7.365
.385
.365
.260
.240
SEE DETAIL A
.15
.09
TYP
.28
.22
TYP
1.15
1.09
.500REF
3.250
3.240
2.15
2.09
1.65
1.59
.65
.59
0
1
6
7
1
10
15
24
29
38
RB
RO
RG
RX
RY
RLP
INSTRUCTIONS
SEE SCHEMATIC 1014486
1. NORMALLY CLOSED
A. PUNCH HOLES IN ADJACENT ROWS EACH BLOCK
2. TO SWITCH
A. DO NOT PUNCH HOLES IN ADJACENT ROWS EACH BLOCK
PART NO.
FACE THIS SIDE OUT
REV
1.781
1.718
.78
.72
.40
.34
.687
.563
.28
.22
SEE DETAIL B
.213
.193
1.228
1.208
2.447
2.427
.875
REF
3.312
3.188

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±
DECIMALS .xxx ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN P. Bucuvalas DATE 18 JAN 65
CHECKED 28 JAN 65
APPROVAL D. O. Bryant 2/24/65
APPROVAL H. W. Morse 26 FEB 65
APPROVAL 2-26-65
NASA APPROVAL
MIT APPROVAL 3/2/65
MIT APPROVAL C. Sperling 3/4/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD, TABULATING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006228
SCALE 1/1
WT
SHEET 1 OF 1

1006228 B

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006228 B

SYM	REVISIONS DESCRIPTION 07222	DATE	APPROVED
B	REPLACES REV A WITH CHANGE PER TDRR 17079	3/2/65	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, NUMBER OF PARTS INCLUDED, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLE)
   - A. DIMENSIONS: AS DELINEATED.
   - B. MATERIAL: SEE TABLE I. REQUIREMENTS LISTED IN TABLE I SHALL BE CERTIFIED WITH EACH LOT SHIPPED.
   - C. FINISH AND APPEARANCE:
     - (1) THE CARDS SHALL HAVE NO ROUGH OR BURRED EDGES.
     - (2) THEY SHALL SHOW NO DELAMINATION OR BLISTERING ON THE EDGES NOR BLISTERING IN EXCESS OF 0.060 DIAMETER ANYWHERE.
     - (3) ALL CHARACTERS AND LINEWORK SHALL BE PRINTED ON THE MIDDLE STRATA AND SHALL BE SHARP AND LEGIBLE BEFORE AND AFTER LAMINATING
   - D. PACKAGING: CARDS SHALL BE PACKAGED IN MOISTURE PROOF BAG, ENVELOPE, OR WRAPPING.
   - E. STRAIGHTNESS & PARALLELISM: EDGES WITHIN 0.003

3. DESIGN REQUIREMENTS:
   - A. STORAGE LIFE: 5 YEARS MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WITHOUT DELAMINATION OR CURLING MORE THAN 0.12.
   - B. AMBIENT TEMPERATURE RANGE: -40°F TO +140°F.

TABLE I

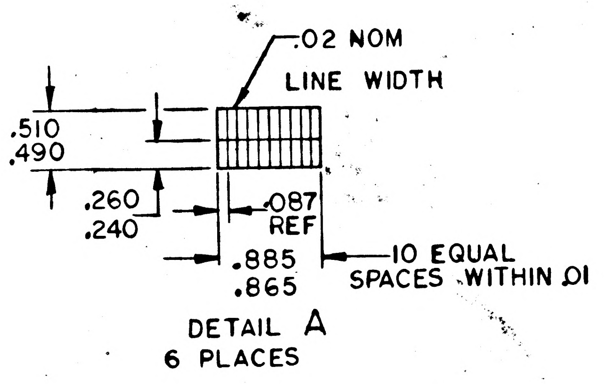
DASH NO.*	MATERIAL
-000	WHITE POLYVINYL CHLORIDE SHEET PER L-V-351, PRINTED & BONDED WITH AN ACRYLIC ADHESIVE BETWEEN 2 LAYERS OF POLYETHYLENE TERAPHTHALATE FILM (MYLAR) CONFORMING TO MIL-I-631 TYPE G, FORM F, GRADE A, CLASS 1. TOTAL THICKNESS 0.012 MAXIMUM
-001	IBM FORM U11897 OR EQUIVALENT

*ORIGINAL CONFIGURATION IDENTIFIED BY THE DWG NO. AND A -000 SUFFIX.

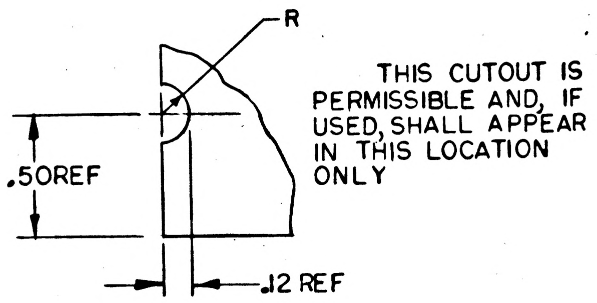
DASH NO.	APPLICABLE NOTES
-000	1, 2, 3
-001	1A, 1B, 2A, 2B, 2C1, 2D, 2E

NOTE APPLICATION

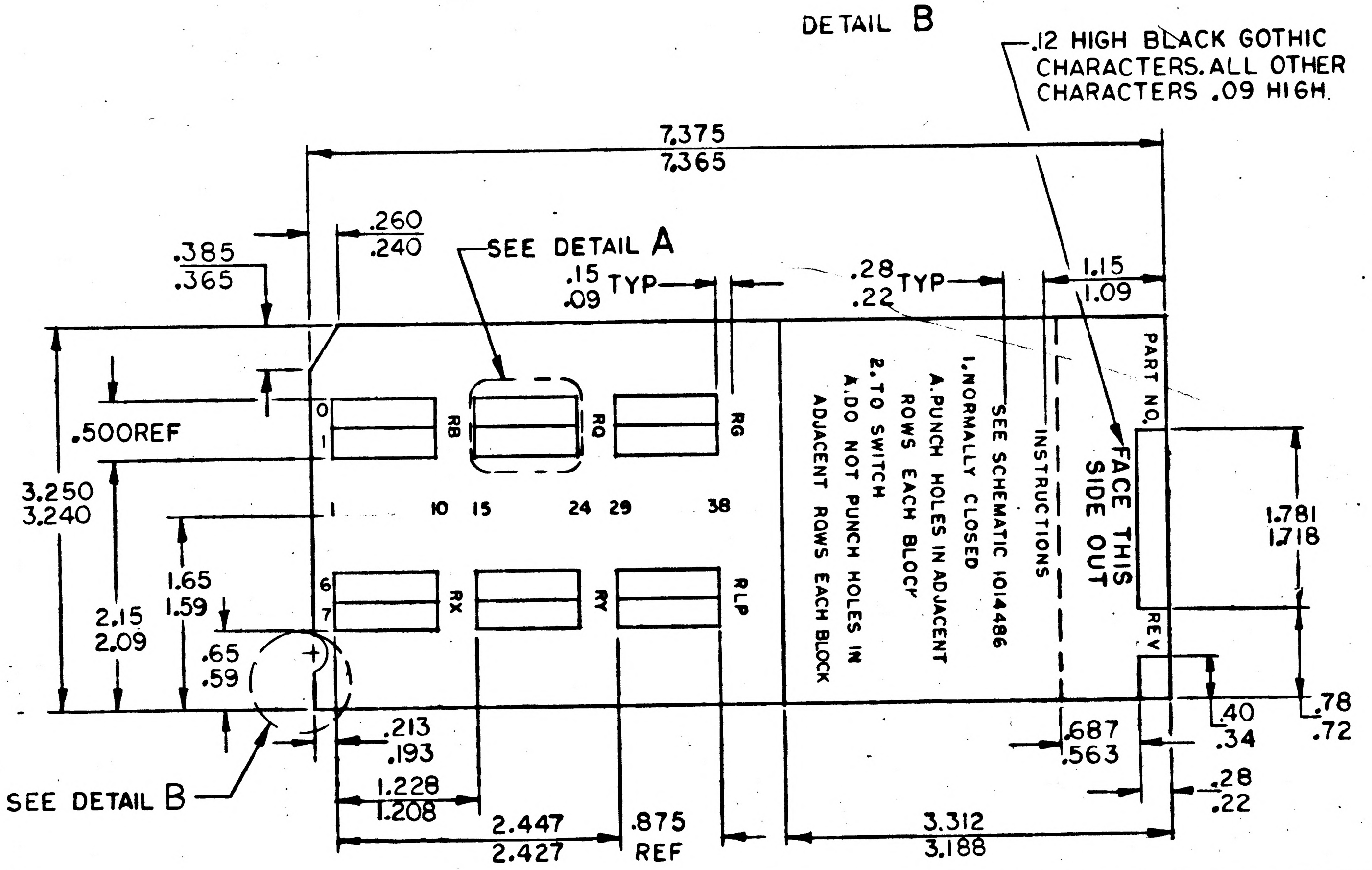
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.


.02 NOM
LINE WIDTH
.510
.490
.260
.240
.087
REF
.885
.865
10 EQUAL
SPACES WITHIN .01

DETAIL A
6 PLACES


R
THIS CUTOUT IS PERMISSIBLE AND, IF USED, SHALL APPEAR IN THIS LOCATION ONLY
.50REF
.12 REF

DETAIL B


.12 HIGH BLACK GOTHIC CHARACTERS. ALL OTHER CHARACTERS .09 HIGH.
7.375
7.365
.385
.365
.260
.240
SEE DETAIL A
.15
.09 TYP
.28
.22 TYP
1.15
1.09
.500REF
3.250
3.240
0
1
RB
RQ
RG
1
10
15
24
29
38
6
7
RX
RY
RLP
SEE SCHEMATIC 1014486
1. NORMALLY CLOSED
A. PUNCH HOLES IN ADJACENT ROWS EACH BLOCK
2. TO SWITCH
A. DO NOT PUNCH HOLES IN ADJACENT ROWS EACH BLOCK
INSTRUCTIONS
FACE THIS SIDE OUT
PART NO.
REV
1.781
1.718
1.65
1.59
2.15
2.09
.65
.59
.213
.193
1.228
1.208
2.447
2.427
.875
REF
3.312
3.188
.687
.563
.40
.34
.78
.72
.28
.22
SEE DETAIL B

Ⓑ REPLACES REV A WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN P. Burwalis DATE 18 JAN 65
CHECKED Norm Adrian 28 JAN 65
APPROVAL D. O'Connor 2/24/65
APPROVAL H. W. Morse 26 FEB 65
APPROVAL 2-26-65
NASA APPROVAL C. C. 3/1/65
MIT APPROVAL 3/2/65
MIT APPROVAL C. Sperling 2/4/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD, TABULATING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006228

SCALE 1/1 WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

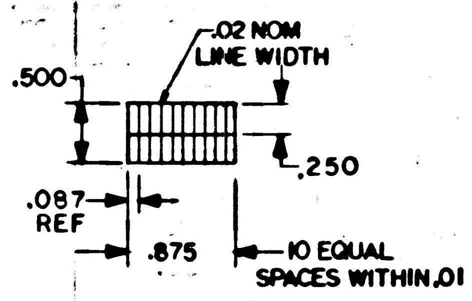
ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07222	3/24/64	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

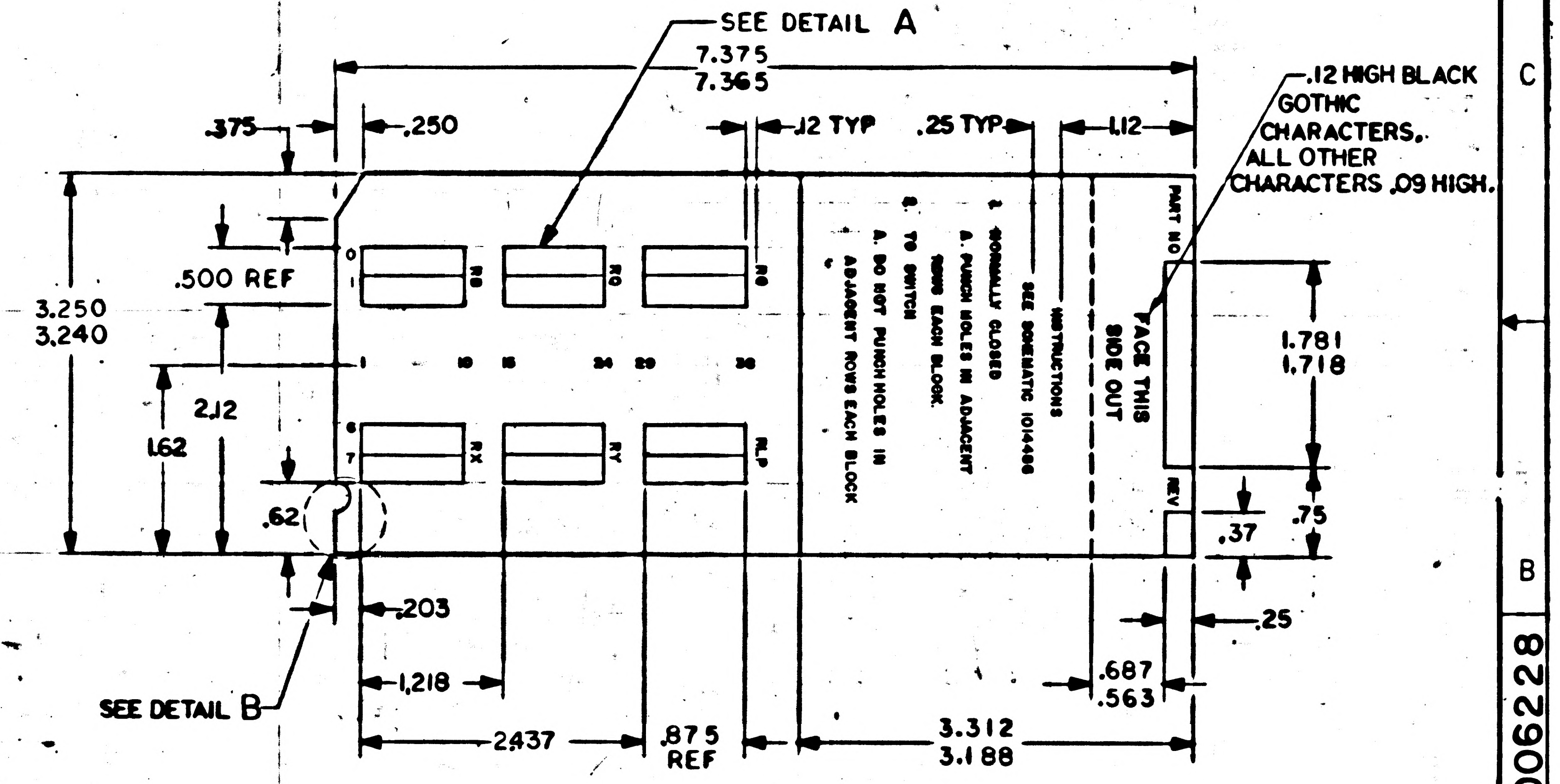
1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, NUMBER OF PARTS INCLUDED, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLE)
   - A. DIMENSIONS: AS DELINEATED.
   - B. MATERIAL: WHITE POLYVINYL CHLORIDE SHEET PER L-V-351, PRINTED AND BONDED WITH AN ACRYLIC ADHESIVE BETWEEN 2 LAYERS OF POLYETHYLENE TERAPHTHALATE FILM (MYLAR) CONFORMING TO MIL-I-631, TYPE 6, FORM F, GRADE A, CLASS I. TOTAL THICKNESS 0.012 MAXIMUM. THIS REQUIREMENT SHALL BE CERTIFIED WITH EACH LOT SHIPPED.
   - C. FINISH AND APPEARANCE: THE CARDS SHALL HAVE NO ROUGH OR BURRED EDGES. THEY SHALL SHOW NO DELAMINATION OR BLISTERING ON THE EDGES NOR BLISTERING IN EXCESS OF 0.060 DIAMETER ANYWHERE. ALL CHARACTERS AND LINEWORK SHALL BE PRINTED ON THE MIDDLE STRATA AND SHALL BE SHARP AND LEGIBLE BEFORE AND AFTER LAMINATING.
   - D. PACKAGING: CARDS SHALL BE PACKAGED IN MOISTURE PROOF BAG, ENVELOPE, OR WRAPPING.
   - E. STRAIGHTNESS & PARALLELISM: EDGES WITHIN 0.003
3. DESIGN REQUIREMENTS:
   - A. STORAGE LIFE: 5 YEARS MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WITHOUT DELAMINATION OR CURLING MORE THAN 0.12.
   - B. AMBIENT TEMPERATURE RANGE: -40°F TO +140°F.

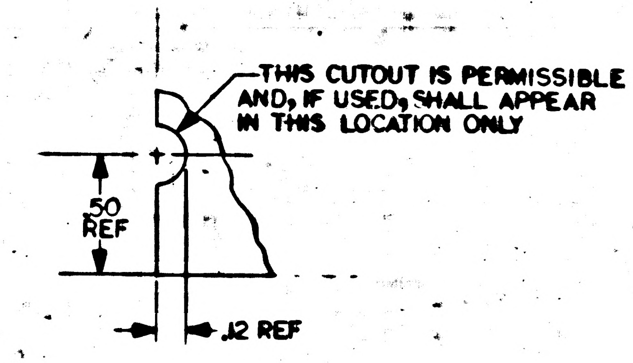

.02 NOM
LINE WIDTH
.500
.250
.087
REF
.875
10 EQUAL
SPACES WITHIN .01

DETAIL A
6 PLACES

FOR INFORMATION ONLY

CLASS B RELEASED TDRR NO. 07222 DATE 3/24/64


SEE DETAIL A
7.375
7.365
.375
.250
.12 TYP
.25 TYP
1.12
.12 HIGH BLACK GOTHIC CHARACTERS. ALL OTHER CHARACTERS .09 HIGH.
3.250
3.240
.500 REF
2.12
1.62
.62
RO
RX
RY
RLP
PART NO
REV
FACE THIS SIDE OUT
INSTRUCTIONS
SEE SCHEMATIC 1014486
1. NORMALLY CLOSED
A. PUNCH HOLES IN ADJACENT ROWS EACH BLOCK.
2. TO SWITCH
A. DO NOT PUNCH HOLES IN ADJACENT ROWS EACH BLOCK
1.781
1.718
.75
.37
.25
.687
.563
.203
1.218
2.437
.875
REF
3.312
3.188
SEE DETAIL B


THIS CUTOUT IS PERMISSIBLE AND, IF USED, SHALL APPEAR IN THIS LOCATION ONLY
.50
REF
.12 REF

DETAIL B

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ±.03 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT

FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.

CONTRACT NO. NAS 498

DRAWN P. La Porte DATE 14 FEB 64
CHECKED Wolkowicz 14 FEB 64
APPROVAL H. Moran 20 FEB 64
APPROVAL R. O. Bryant
APPROVAL L. E. Stidham 2/20/64
NASA APPROVAL A. C. Metzger 3/4/64
MIT APPROVAL L. Hazel 3/24/64
MIT APPROVAL C. Sparling 3/24/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD, TABULATING,
PLASTIC, PERMANENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006228
SCALE NONE	WT	SHEET 1 OF 1

1006228

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07656		
A	CHANGED PER TDRR 10446 DR S.T. Orifice CHK APPD	7-1-64	

REQUIREMENTS:

1. **GENERAL:**

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST SIZE SHALL BE 0.000 INCH MAXIMUM.

(2) DELETE PART (b) OF PARAGRAPH 3.2.1.8.2, THAT IS "SIZE DISTRIBUTION - AT LEAST 90% ARE BETWEEN 0.00002 AND 0.00008 INCH IN SIZE".

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILA-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105.

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN 1/4 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN 3/16 HIGH CHARACTERS.

(4) EACH CONTAINER SHALL HAVE AN IDENTIFICATION PLATE IN ACCORDANCE WITH NASA DRAWING 1020006 IN THE LOCATION INDICATED HEREON. THE NAME AND PART NUMBER SHALL BE THE SAME AS THE TITLE, DRAWING NUMBER AND REVISION LETTER HEREON.

(5) THE BOTTOM CUSHION IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY UNDER EACH TIE DOWN AND LIFT RING "SLING-LIFT HERE".

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".

2. ACCEPTANCE AND INSPECTION: (100 PERCENT)

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND DUST SHIELD LOCATED BEHIND PRESSURE RELIEF VALVE.

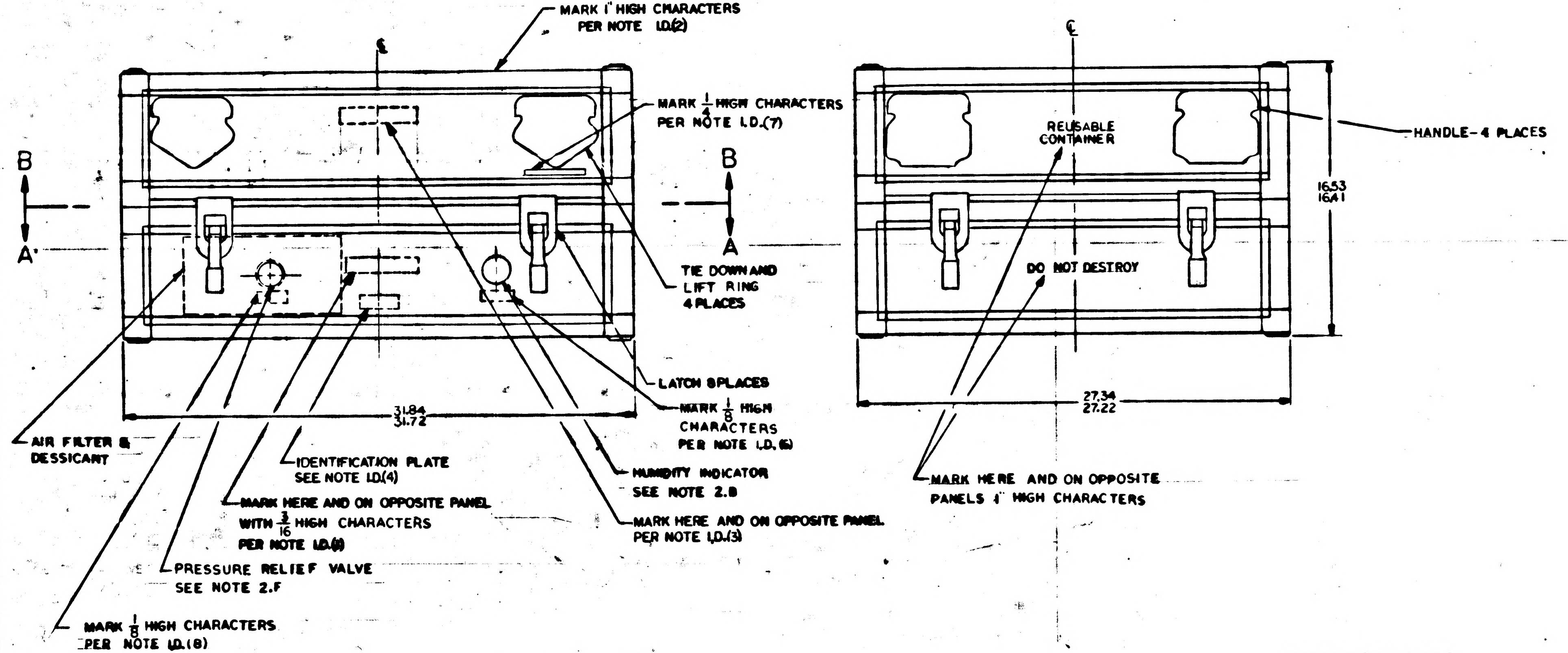
D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT.

F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.

3. DESIGN:

A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.



MARK 1" HIGH CHARACTERS PER NOTE 1.D.(2)
MARK 1/4 HIGH CHARACTERS PER NOTE 1.D.(7)
B
A
B
A
TIE DOWN AND LIFT RING 4 PLACES
LATCH 8 PLACES
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(6)
HUMIDITY INDICATOR SEE NOTE 2.B
MARK HERE AND ON OPPOSITE PANEL PER NOTE 1.D.(3)
31.84
31.72
AIR FILTER & DESSICANT
IDENTIFICATION PLATE SEE NOTE 1.D.(4)
MARK HERE AND ON OPPOSITE PANEL WITH 3/16 HIGH CHARACTERS PER NOTE 1.D.(1)
PRESSURE RELIEF VALVE SEE NOTE 2.F
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(8)
℄
REUSABLE CONTAINER
DO NOT DESTROY
HANDLE-4 PLACES
16.53
16.41
27.34
27.22
MARK HERE AND ON OPPOSITE PANELS 1" HIGH CHARACTERS

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 07656 DATE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

A	A
—	—
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE

RAYTHEON CO
LEXINGTON, MASS.
CONTRACT NO NAS 9-498
DRAWN DATE
CHECKED
APPROVAL
APPROVAL 9 APR 64
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

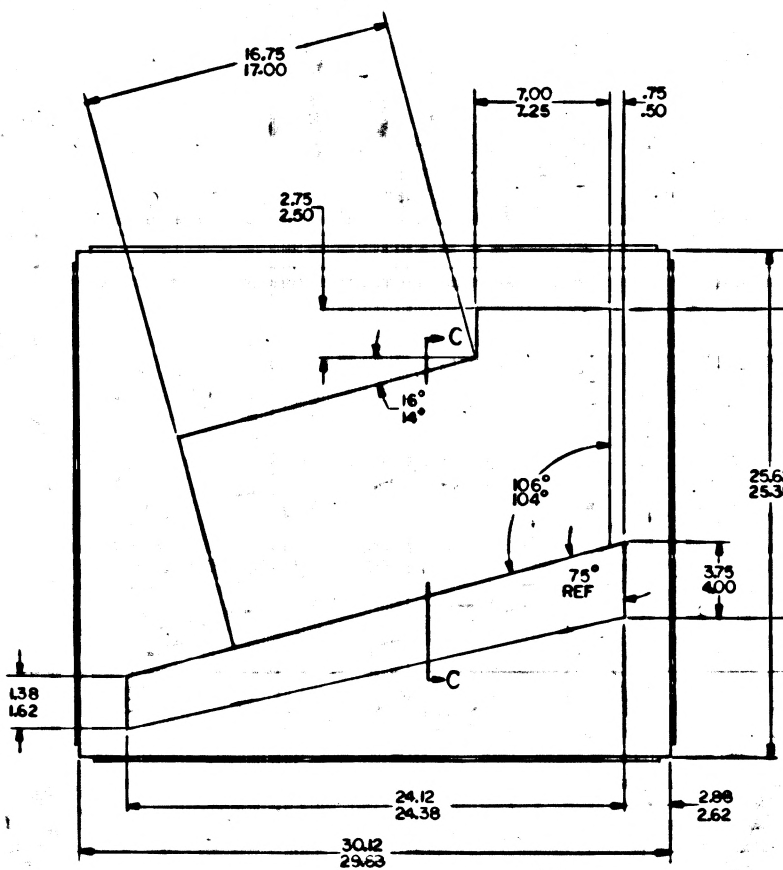
CONTAINER, SHIPPING AND STORAGE-
APOLLO MAIN DISPLAY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE D NASA DRAWING NO 1006229
SCALE NONE WT SHEET 1 OF 2

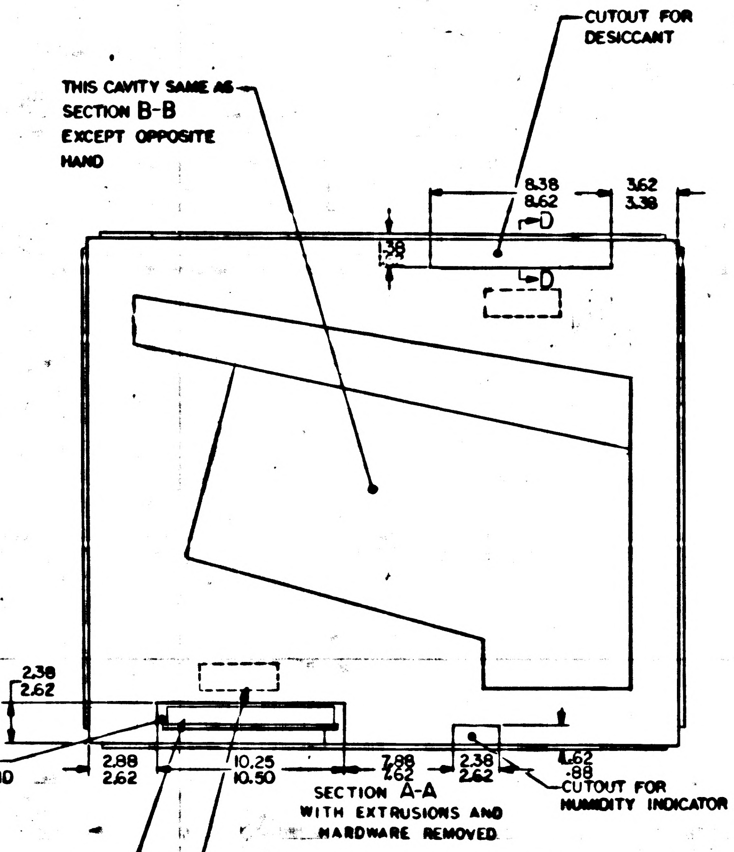
1006229

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07656		
A	CHANGED PER TDRR 10446 DR S.T. Quifie CHK Young APPD Maynard	7/7/64	NEB


16.75
17.00
7.00
7.25
.75
.50
2.75
2.50
C
C
16°
14°
106°
104°
75°
REF
2.88
2.62
15.75
16.00
25.62
25.38
3.75
4.00
1.38
1.62
24.12
24.38
2.88
2.62
30.12
29.63

SECTION B-B
WITH EXTRUSIONS AND
HARDWARE REMOVED

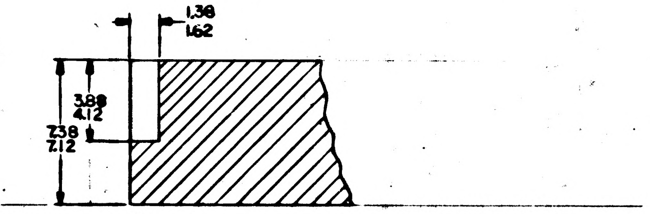

CUTOUT FOR
DESICCANT
THIS CAVITY SAME AS
SECTION B-B
EXCEPT OPPOSITE
HAND
8.38
8.62
3.62
3.38
D
D
.38
.62
2.38
2.62
CUTOUT FOR
AIR FILTER AND
DESICCANT
2.88
2.62
10.25
10.50
7.88
7.62
2.38
2.62
1.62
.88
CUTOUT FOR
HUMIDITY INDICATOR

SECTION A-A
WITH EXTRUSIONS AND
HARDWARE REMOVED

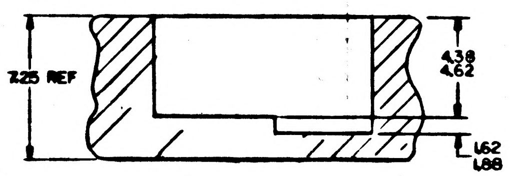
MARK $\frac{1}{8}$ HIGH CHARACTERS PER NOTE 1.D.(5)
2 PLACES

AIR FILTER
AND DESICCANT

FOR INFORMATION ONLY.
CLASS B RELEASE TDRR NO. 07656 DATE 4/14/64


1.38
1.62
3.88
4.12
7.38
7.12

SECTION D-D
ROTATED 90° CCW


7.25 REF
4.38
4.62
1.62
1.88

SECTION C-C
ROTATED 90° CCW

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-498
DRAWN DATE 27 FEB 64
CHECKED
APPROVAL
APPROVAL Meyers 9 APR 64
APPROVAL CN Rue 9 Apr 64
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE—
APOLLO MAIN DISPLAY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE D
NASA DRAWING NO 1006229
SCALE NONE
WT
SHEET 2 OF 2

1006229

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST SIZE SHALL BE 0.0004 INCH MAXIMUM.

(2) DELETE PART (b) OF PARAGRAPH 3.2.1.8.2, THAT IS "SIZE DISTRIBUTION - AT LEAST 90% ARE BETWEEN 0.00002 AND 0.00008 INCH IN SIZE".

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105.

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN 1/4 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN 3/16 HIGH CHARACTERS.

(4) EACH CONTAINER SHALL HAVE AN IDENTIFICATION PLATE IN ACCORDANCE WITH NASA DRAWING 1020006 IN THE LOCATION INDICATED HEREON. THE NAME AND PART NUMBER SHALL BE THE SAME AS THE TITLE, DRAWING NUMBER AND REVISION LETTER HEREON.

(5) THE BOTTOM CUSHION IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY UNDER EACH TIE DOWN AND LIFT RING "SLING LIFT HERE".

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".

2. ACCEPTANCE AND INSPECTION: (100 PERCENT)

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND DUST SHIELD LOCATED BEHIND PRESSURE RELIEF VALVE.

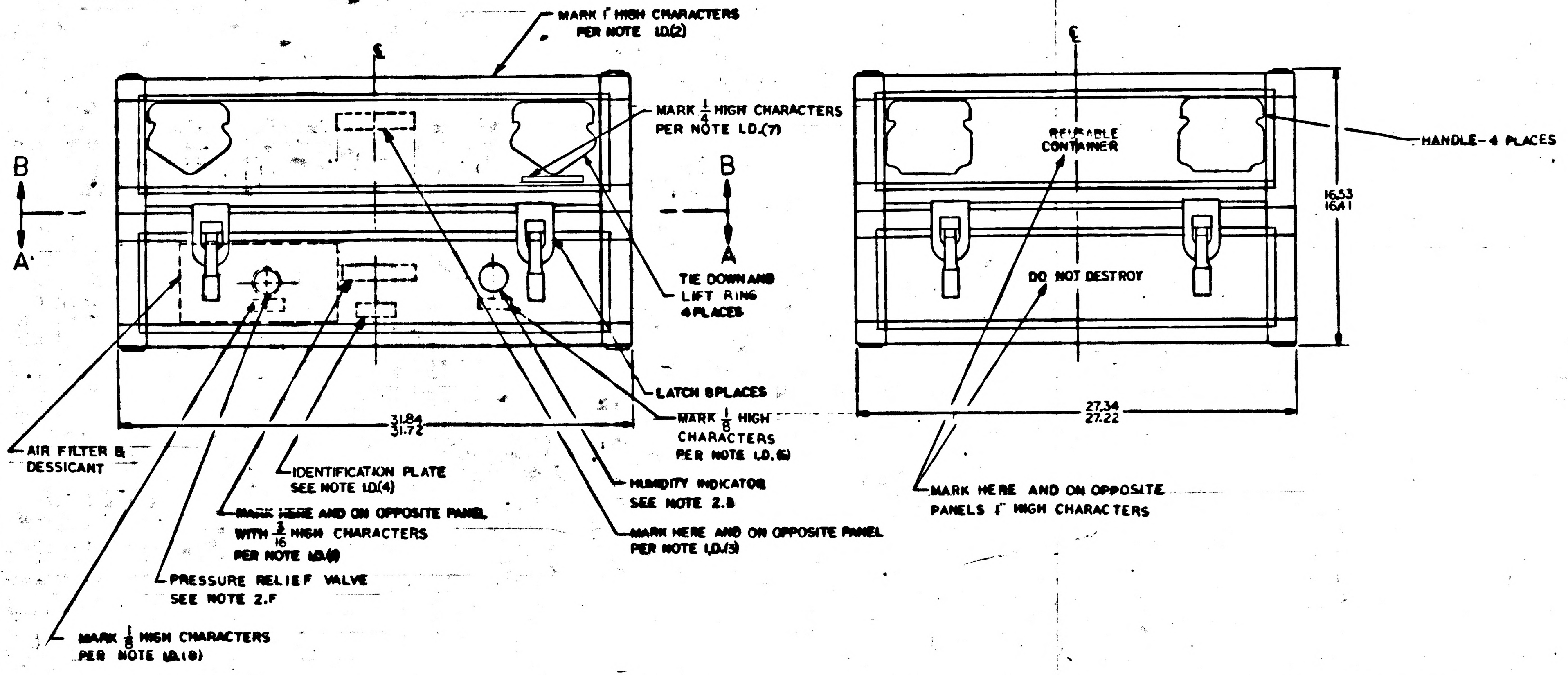
D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT.

F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.

3. DESIGN:

A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.


MARK 1" HIGH CHARACTERS PER NOTE 1.D.(2)
MARK 1/4 HIGH CHARACTERS PER NOTE 1.D.(7)
B
A
B
A
℄
℄
REUSABLE CONTAINER
HANDLE-4 PLACES
16.53
16.41
TIE DOWN AND LIFT RING 4 PLACES
DO NOT DESTROY
LATCH 8 PLACES
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(6)
31.84
31.72
27.34
27.22
AIR FILTER & DESSICANT
IDENTIFICATION PLATE SEE NOTE 1.D.(4)
HUMIDITY INDICATOR SEE NOTE 2.B
MARK HERE AND ON OPPOSITE PANELS 1" HIGH CHARACTERS
MARK HERE AND ON OPPOSITE PANEL WITH 3/16 HIGH CHARACTERS PER NOTE 1.D.(1)
MARK HERE AND ON OPPOSITE PANEL PER NOTE 1.D.(3)
PRESSURE RELIEF VALVE SEE NOTE 2.F
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(8)

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 07656 DATE

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07656		

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 21FEB
CHECKED
APPROVAL
APPROVAL 9 APR 64
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

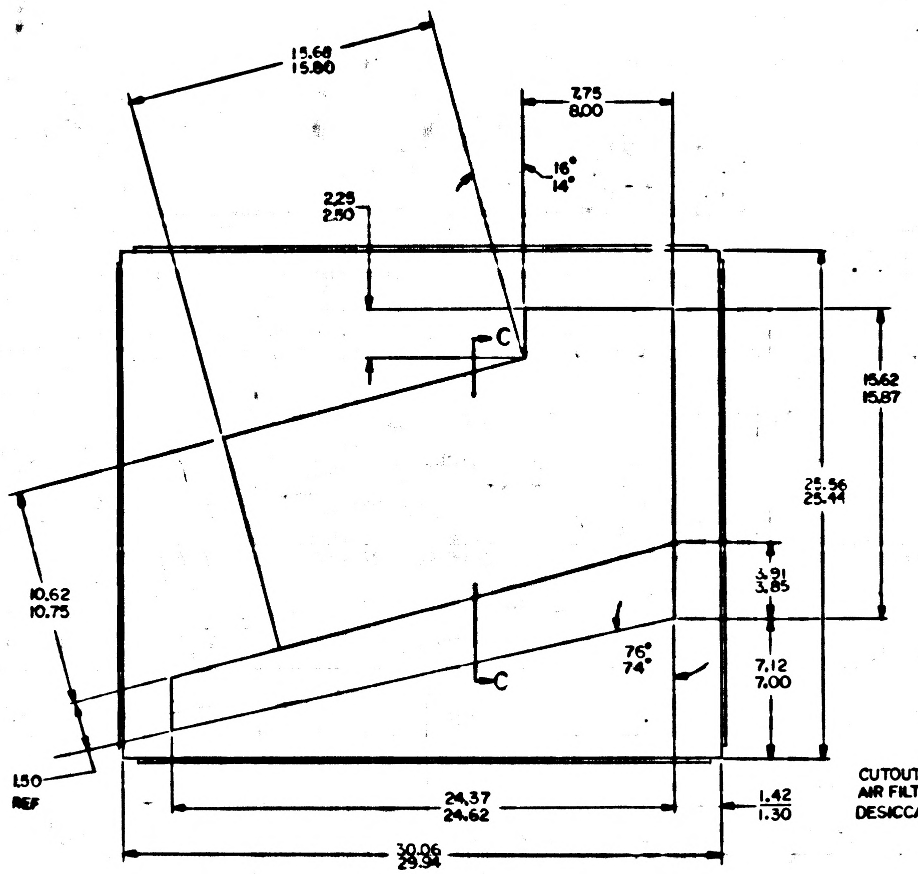
CONTAINER, SHIPPING AND STORAGE-APOLLO MAIN DISPLAY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE D
NASA DRAWING NO 1006229
SCALE NONE
WT
SHEET 1 OF 2

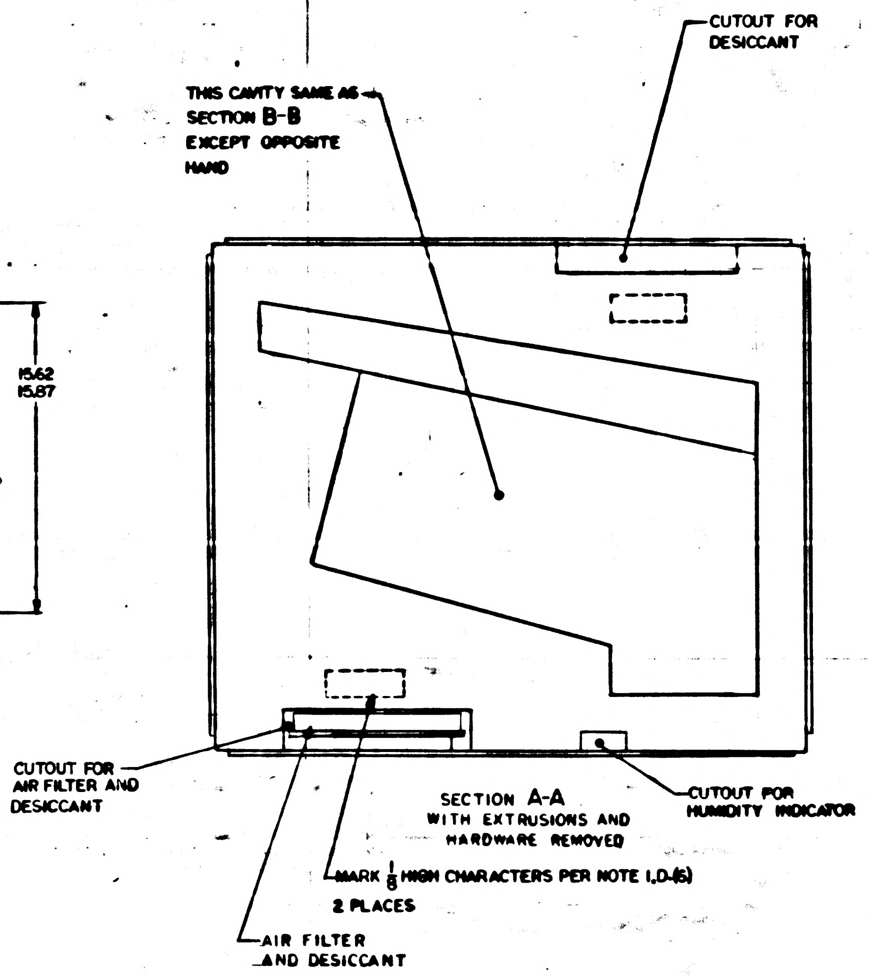
1006229

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07656		

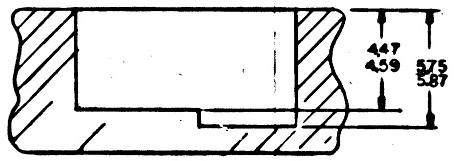

15.68
15.80
2.75
8.00
16°
14°
2.25
2.50
C
15.62
15.87
25.56
25.44
3.91
3.85
7.12
7.00
76°
74°
10.62
10.75
C
1.50
REF
24.37
24.62
1.42
1.30
30.06
29.94

SECTION B-B
WITH EXTRUSIONS AND
HARDWARE REMOVED


THIS CAVITY SAME AS
SECTION B-B
EXCEPT OPPOSITE
HAND
CUTOUT FOR
DESICCANT
CUTOUT FOR
AIR FILTER AND
DESICCANT
CUTOUT FOR
HUMIDITY INDICATOR
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(6)
2 PLACES
AIR FILTER
AND DESICCANT

SECTION A-A
WITH EXTRUSIONS AND
HARDWARE REMOVED

FOR INFORMATION ONLY.
CLASS B RELEASE TDRR NO. 07656 DATE 4/10/64


4.47
4.59
5.75
5.87

SECTION C-C

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-498

DRAWN	N. Matte DATE 2 MAR 64
CHECKED	[illegible]
APPROVAL	[illegible]
APPROVAL	M. Mayer 9 APR 64
APPROVAL	C N Kue 9 Apr 64
NASA APPROVAL	[illegible]
MIT APPROVAL	[illegible] 4/14/64
MIT APPROVAL	[illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE—
APOLLO MAIN DISPLAY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO	SIZE	NASA DRAWING NO
—	D	1006229
SCALE NONE	WT	SHEET 2 OF 2

1006229

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER IDNR 07656		

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE B WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST SIZE SHALL BE 0.0004 INCH MAXIMUM.

(2) DELETE PART (b) OF PARAGRAPH 3.2.1.8.2, THAT IS "SIZE DISTRIBUTION - AT LEAST 90% ARE BETWEEN 0.00002 AND 0.00008 INCH IN SIZE".

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR ~~IN ACCORDANCE WITH FEDERAL STANDARD~~ 595 COLOR NUMBER 21105

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN 1/4 HIGH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN 3/16 HIGH CHARACTERS.

(4) EACH CONTAINER SHALL HAVE AN IDENTIFICATION PLATE IN ACCORDANCE WITH NASA DRAWING 1020006 IN THE LOCATION INDICATED HEREON. THE NAME AND PART NUMBER SHALL BE THE SAME AS THE TITLE, DRAWING NUMBER AND REVISION LETTER HEREON.

(5) THE BOTTOM CUSHION IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY UNDER EACH TIE DOWN AND LIFT RING "SLING LIFT HERE"

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".

2. ACCEPTANCE AND INSPECTION: (100 PERCENT)

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND DUST SHIELD LOCATED BEHIND PRESSURE RELIEF VALVE.

D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT.

F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.

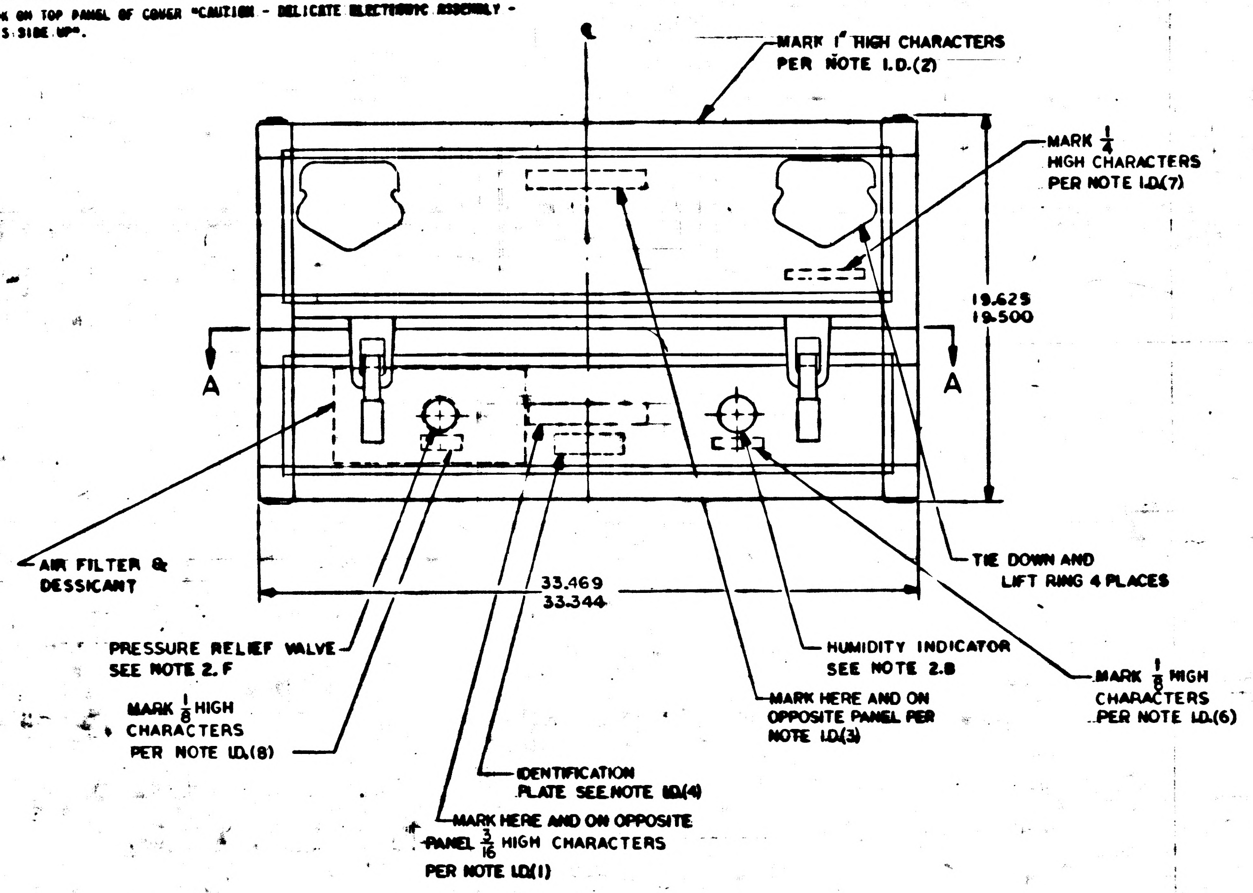
3. DESIGN:

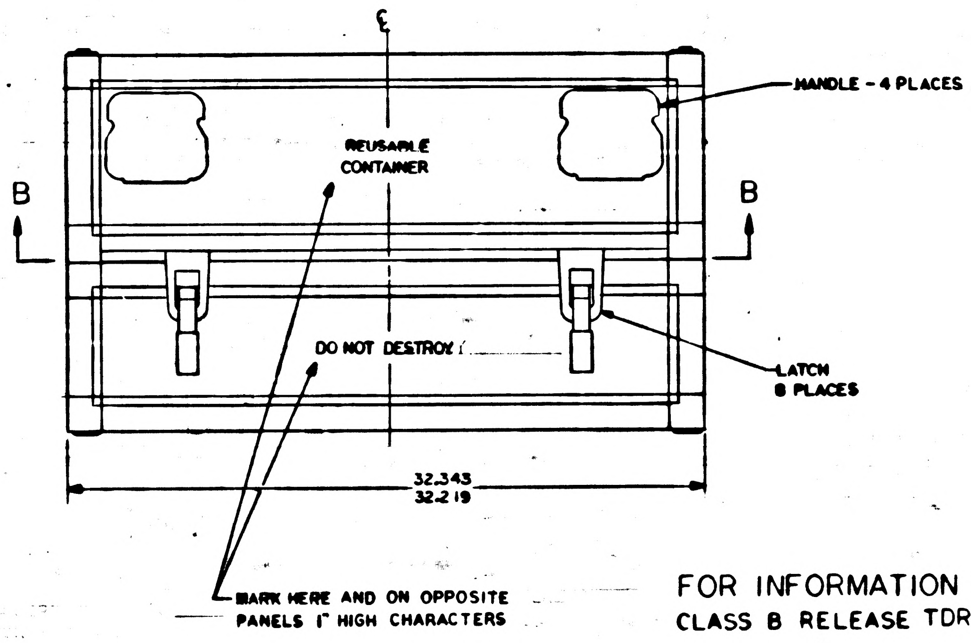
A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.

B. MATERIAL:

(1) WEBBING: IN ACCORDANCE WITH MIL-W-530, TYPE I, CLASS 7, .051 THICK.

(2) PLATE: ALUMINUM ALLOY 6061-T6 PER QQ-A-00250/11 .125 THICK.


MARK 1" HIGH CHARACTERS PER NOTE 1.D.(2)
MARK 1/4 HIGH CHARACTERS PER NOTE 1.D.(7)
19.625
19.500
A
A
TIE DOWN AND LIFT RING 4 PLACES
AIR FILTER & DESSICANT
33.469
33.344
PRESSURE RELIEF VALVE SEE NOTE 2.F
HUMIDITY INDICATOR SEE NOTE 2.B
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(8)
MARK HERE AND ON OPPOSITE PANEL PER NOTE 1.D.(3)
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(6)
IDENTIFICATION PLATE SEE NOTE 1.D.(4)
MARK HERE AND ON OPPOSITE PANEL 3/16 HIGH CHARACTERS PER NOTE 1.D.(1)


REUSABLE CONTAINER
HANDLE - 4 PLACES
B
B
DO NOT DESTROY
LATCH 8 PLACES
32.343
32.219
MARK HERE AND ON OPPOSITE PANELS 1" HIGH CHARACTERS

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. DATE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.062 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS 9-498
DRAWN DATE
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

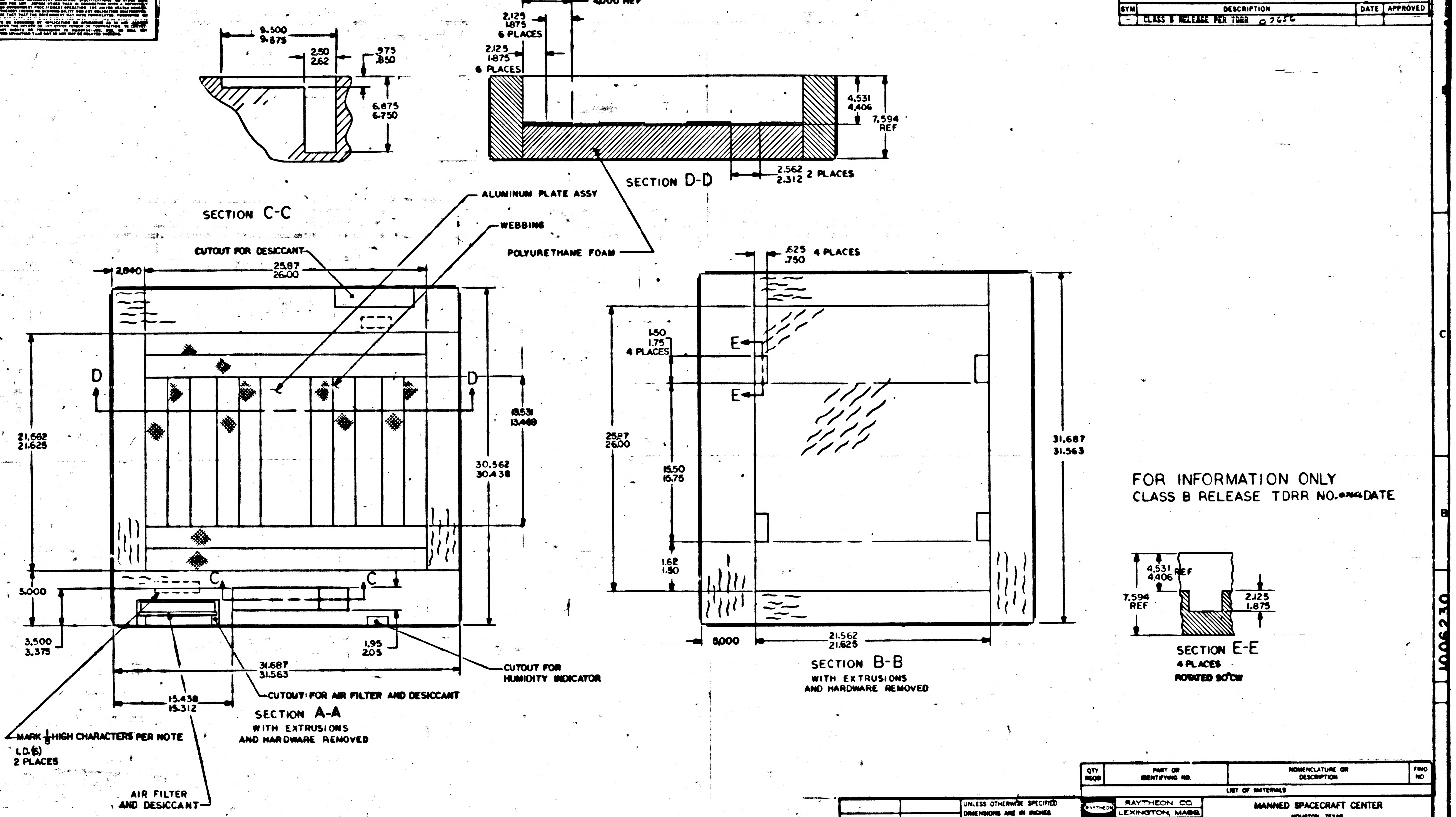
CONTAINER, SHIPPING AND STORAGE—
APOLLO GUIDANCE COMPUTER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE D
NASA DRAWING NO 1006230
SCALE NONE
WT
SHEET 1 OF 2

1006230

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07656		



SECTION C-C
9.500
9.875
2.50
2.62
.975
.850
6.875
6.750
4.000 REF
2.125
1.875
6 PLACES
2.125
1.875
6 PLACES
4.531
4.406
7.594
REF
2.562
2.312
2 PLACES
SECTION D-D
ALUMINUM PLATE ASSY
WEBBING
POLYURETHANE FOAM
CUTOUT FOR DESICCANT
2.840
25.87
26.00
D
D
21.562
21.625
18.531
13.469
30.562
30.438
C
C
5.000
3.500
3.375
1.95
2.05
31.687
31.563
15.438
15.312
CUTOUT FOR HUMIDITY INDICATOR
CUTOUT FOR AIR FILTER AND DESICCANT
SECTION A-A
WITH EXTRUSIONS
AND HARDWARE REMOVED
MARK 1/8 HIGH CHARACTERS PER NOTE
I.D.(6)
2 PLACES
AIR FILTER
AND DESICCANT
.625
.750
4 PLACES
1.50
1.75
4 PLACES
E
E
25.87
26.00
15.50
15.75
1.62
1.50
31.687
31.563
5.000
21.562
21.625
SECTION B-B
WITH EXTRUSIONS
AND HARDWARE REMOVED
4.531
4.406
REF
7.594
REF
2.125
1.875
SECTION E-E
4 PLACES
ROTATED 90° CW

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 07656 DATE

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.062 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS9-498
DRAWN R.D. [illegible] DATE [illegible]
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible] 7 APR 64
APPROVAL C.N. [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE – APOLLO GUIDANCE COMPUTER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO —
SIZE D
NASA DRAWING NO 1006230
SCALE NONE
WT
SHEET 2 OF 2

1006230

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07656		
A	CHANGED PER TDRR 10433 DR B Kutenko CH APPD H. Maynard	JUL 64	JB

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MD 1015404 CLASS 3.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST SIZE SHALL BE 0.008 INCH MAXIMUM.

(2) DELETE PART (b) OF PARAGRAPH 3.2.1.8.2, THAT IS "SIZE DISTRIBUTION - AT LEAST 90% ARE BETWEEN 0.00002 AND 0.00008 INCH IN SIZE".

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MD 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "[illegible] - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN 1/4 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN 3/16 INCH CHARACTERS.

(4) EACH CONTAINER SHALL HAVE AN IDENTIFICATION PLATE IN ACCORDANCE WITH NASA DRAWING 1020006 IN THE LOCATION INDICATED HEREON. THE NAME AND PART NUMBER SHALL BE THE SAME AS THE TITLE, DRAWING NUMBER AND REVISION LETTER HEREON.

(5) THE BOTTOM CUSHION IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY UNDER EACH TIE DOWN AND LIFT RING "SLING LIFT HERE"

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER.

2. ACCEPTANCE AND INSPECTION: (100 PERCENT)

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND DUST SHIELD LOCATED BEHIND PRESSURE RELIEF VALVE.

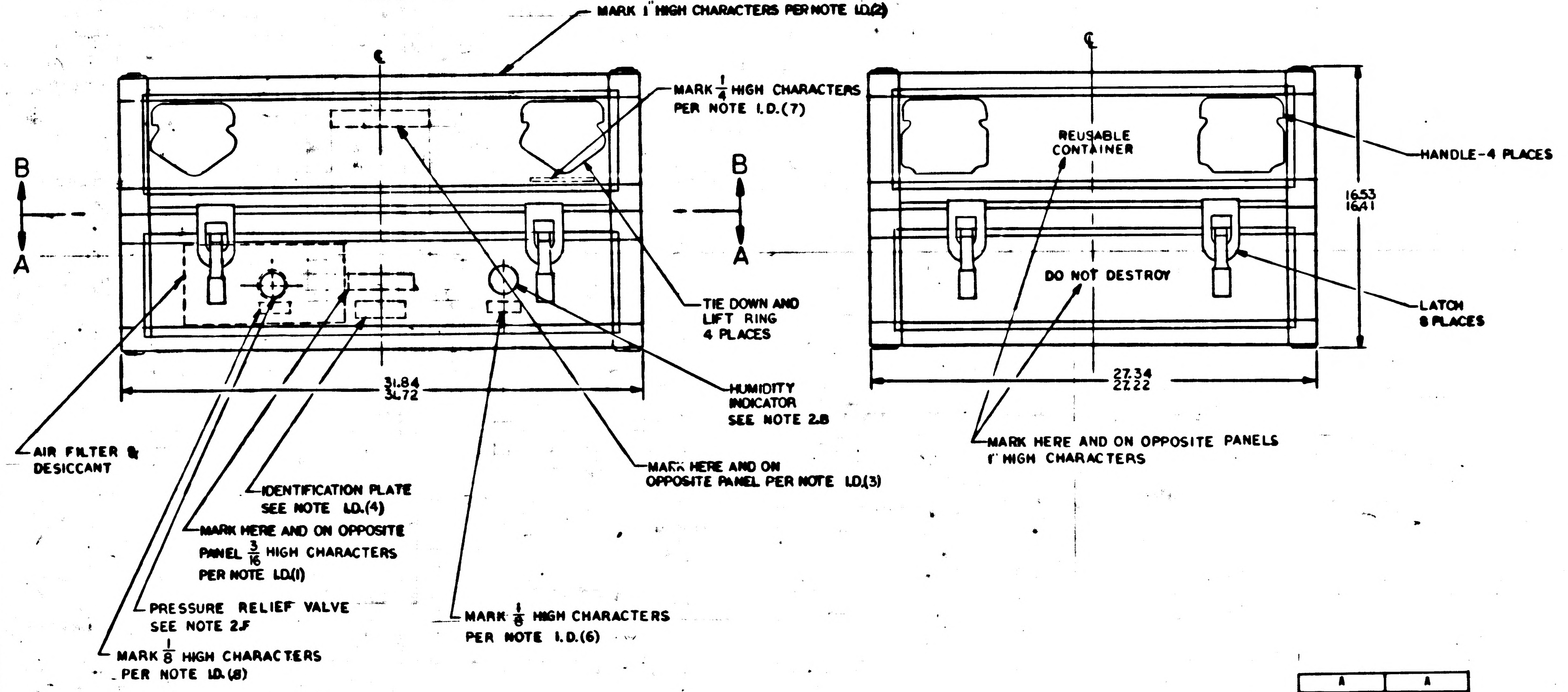
D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT.

F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.

3. DESIGN:

A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.


MARK 1" HIGH CHARACTERS PER NOTE 1.D.(2)
MARK 1/4 HIGH CHARACTERS PER NOTE 1.D.(7)
℄
B
A
B
A
REUSABLE CONTAINER
DO NOT DESTROY
HANDLE-4 PLACES
1.653
1.641
LATCH 8 PLACES
TIE DOWN AND LIFT RING 4 PLACES
31.84
31.72
27.34
27.22
HUMIDITY INDICATOR SEE NOTE 2.B
AIR FILTER & DESICCANT
MARK HERE AND ON OPPOSITE PANEL PER NOTE 1.D.(3)
MARK HERE AND ON OPPOSITE PANELS 1" HIGH CHARACTERS
IDENTIFICATION PLATE SEE NOTE 1.D.(4)
MARK HERE AND ON OPPOSITE PANEL 3/16 HIGH CHARACTERS PER NOTE 1.D.(1)
PRESSURE RELIEF VALVE SEE NOTE 2.F
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(6)
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(8)

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 07656 DATE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN MD 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

A	A
—	—
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS 9-498
DRAWN K. Matz DATE 20 FEB 64
CHECKED J. W. Horning 8 APR 64
APPROVAL R. J. Blanking JPK
APPROVAL W. Myers 9 APR 64
APPROVAL C. K. Rees 9 Apr 64
NASA APPROVAL C. E. [illegible]
MIT APPROVAL L. Hefferty
MIT APPROVAL L. Johnson

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE— APOLLO NAVIGATIONAL DISPLAY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO	SIZE	NASA DRAWING NO
——	D	1006231

SCALE NONE WT SHEET 1 OF 2

1006231

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. **GENERAL:**

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST SIZE SHALL BE 0.0004 INCH MAXIMUM.

(2) DELETE PART (b) OF PARAGRAPH 3.2.1.8.2, THAT IS "SIZE DISTRIBUTION - AT LEAST 90% ARE BETWEEN 0.00002 AND 0.00008 INCH IN SIZE".

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN 1/4 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN 3/16 INCH CHARACTERS.

(4) EACH CONTAINER SHALL HAVE AN IDENTIFICATION PLATE IN ACCORDANCE WITH NASA DRAWING 1020006 IN THE LOCATION INDICATED HEREON. THE NAME AND PART NUMBER SHALL BE THE SAME AS THE TITLE, DRAWING NUMBER AND REVISION LETTER HEREON.

(5) THE BOTTOM CUSHION IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY UNDER EACH TIE DOWN AND LIFT RING "SLING LIFT HERE"

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER.

2. **ACCEPTANCE AND INSPECTION: (100 PERCENT)**

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND DUST SHIELD LOCATED BEHIND PRESSURE RELIEF VALVE.

D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

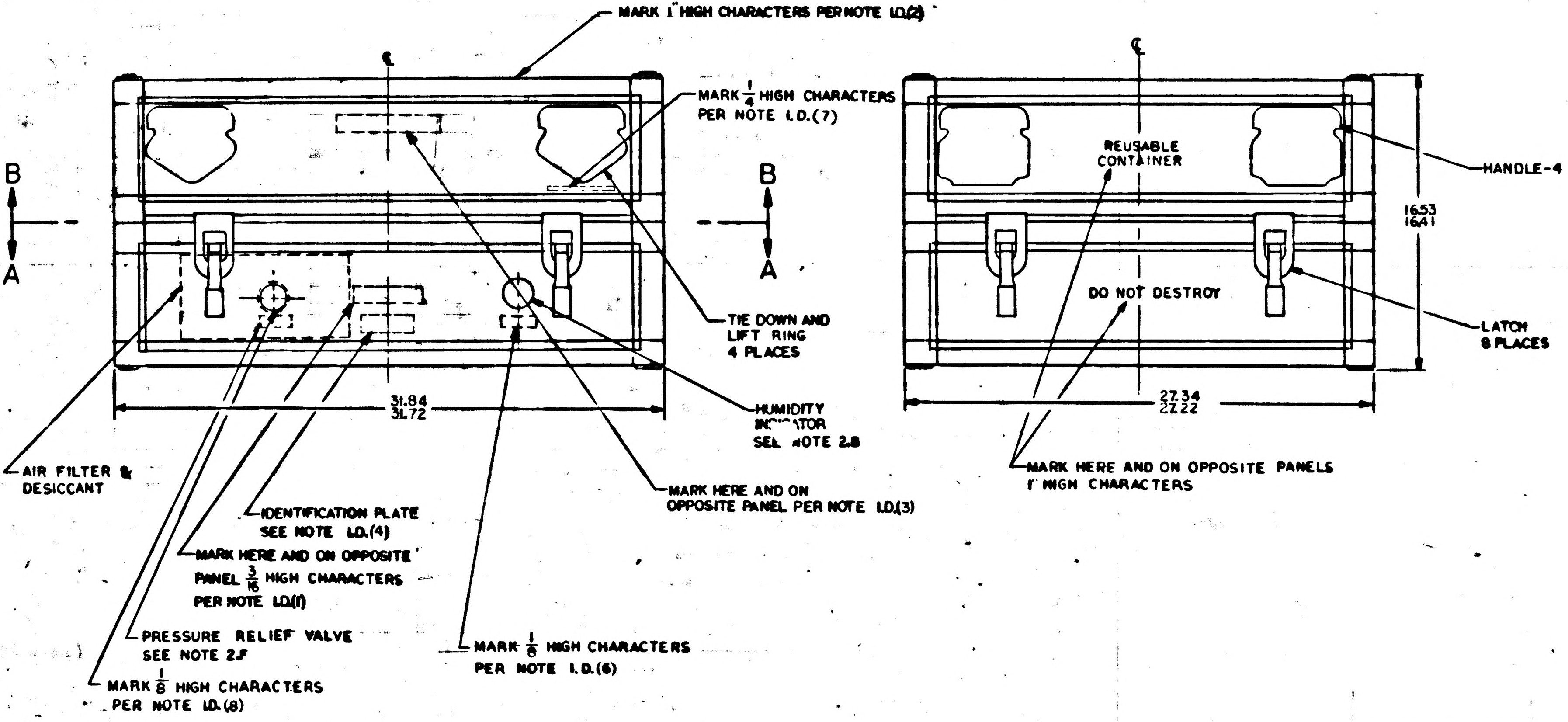
E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT.

F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.

3. **DESIGN:**

A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1010194.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07656		



MARK 1" HIGH CHARACTERS PER NOTE 1.D.(2)
℄
MARK 1/4 HIGH CHARACTERS PER NOTE 1.D.(7)
B
A
B
A
TIE DOWN AND LIFT RING 4 PLACES
HUMIDITY INDICATOR SEE NOTE 2.B
31.84
31.72
AIR FILTER & DESICCANT
IDENTIFICATION PLATE SEE NOTE 1.D.(4)
MARK HERE AND ON OPPOSITE PANEL 3/16 HIGH CHARACTERS PER NOTE 1.D.(1)
PRESSURE RELIEF VALVE SEE NOTE 2.F
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(8)
MARK 1/8 HIGH CHARACTERS PER NOTE 1.D.(6)
MARK HERE AND ON OPPOSITE PANEL PER NOTE 1.D.(3)
℄
REUSABLE CONTAINER
DO NOT DESTROY
HANDLE-4 PLACES
16.53
16.41
LATCH 8 PLACES
27.34
27.22
MARK HERE AND ON OPPOSITE PANELS 1" HIGH CHARACTERS

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 07656 DATE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	—
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS 9-498
DRAWN DATE 20 FEB 64
CHECKED 8 APR 64
APPROVAL
APPROVAL
APPROVAL 9 Apr 64
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

**CONTAINER, SHIPPING AND STORAGE—
APOLLO NAVIGATIONAL DISPLAY**
SPECIFICATION CONTROL DRAWING

CODE IDENT NO —
SIZE D
NASA DRAWING NO 1006231
SCALE NONE
WT
SHEET 1 OF 2

1006231

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
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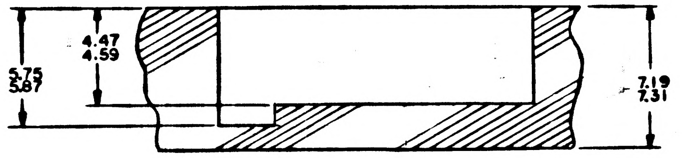
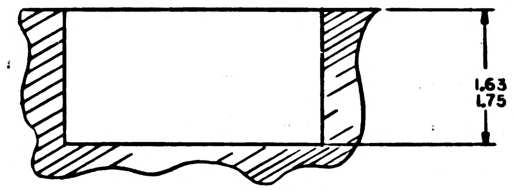
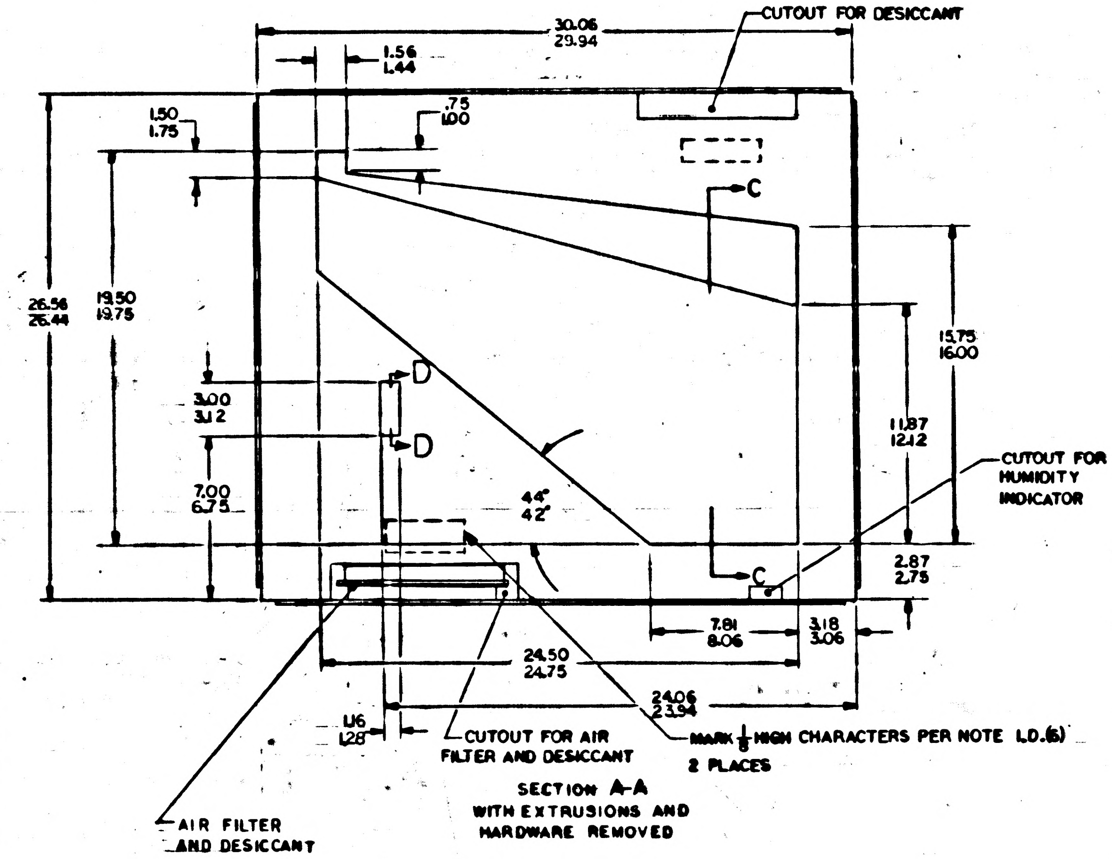

5.75
5.67
4.47
4.59
7.19
7.31

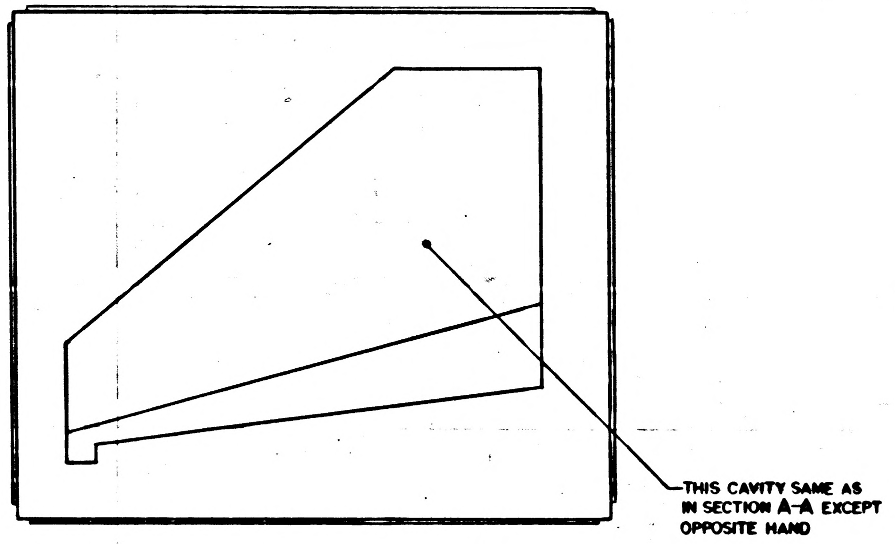
SECTION C-C
ROTATED 90° CCW



SECTION D-D
ROTATED 90° CCW


30.06
29.94
CUTOUT FOR DESICCANT
1.56
1.44
1.50
1.75
.75
1.00
C
26.56
26.44
19.50
19.75
D
3.00
3.12
D
7.00
6.75
44°
42°
15.75
16.00
11.87
12.12
CUTOUT FOR HUMIDITY INDICATOR
C
2.87
2.75
7.81
8.06
3.18
3.06
24.50
24.75
24.06
23.94
1.16
1.28
CUTOUT FOR AIR FILTER AND DESICCANT
MARK 1/8 HIGH CHARACTERS PER NOTE I.D.(6)
2 PLACES
AIR FILTER
AND DESICCANT

SECTION A-A
WITH EXTRUSIONS AND HARDWARE REMOVED


THIS CAVITY SAME AS IN SECTION A-A EXCEPT OPPOSITE HAND

SECTION B-B
WITH EXTRUSIONS AND HARDWARE REMOVED

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 07656 DATE 4/14/64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS9-498
DRAWN DATE
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
APPROVAL
APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE—APOLLO NAVIGATIONAL DISPLAY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO —— SIZE D NASA DRAWING NO 1006231
SCALE NONE WT SHEET 2 OF 2

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 0F541	5/19/6	LL

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   B. MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER, DASH NUMBER, AND REVISION). UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED EXTERNALLY AND INTERNALLY, IN ACCORDANCE WITH MIL-STD-130, WITH THE MANUFACTURER'S NAME, PART NUMBER, LOT CODE OR NUMBER, AND NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION:

   A. DIMENSIONS: AS SHOWN HEREIN.

   B. CERTIFICATION: COMPLIANCE WITH THE MATERIAL AND FINISH DESIGN REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

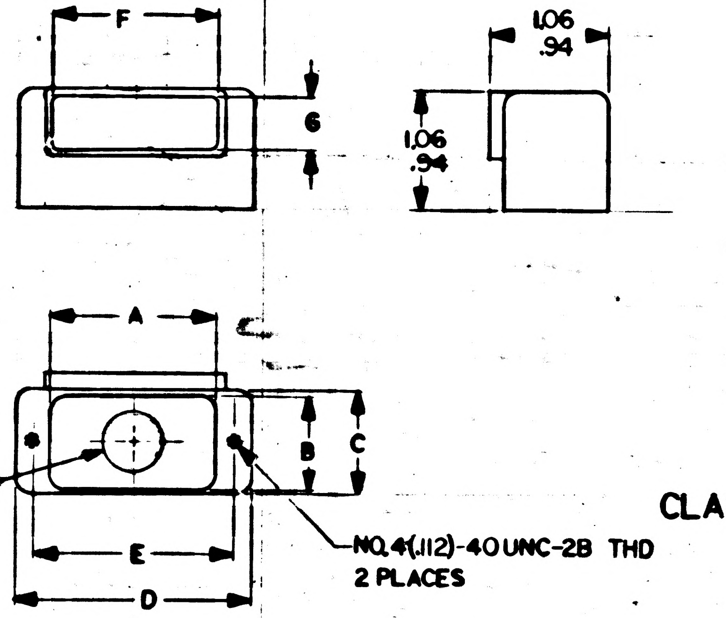
   C. PARTS INCLUDED: EACH POTTING SHELL SHALL BE SUPPLIED TOGETHER WITH A PIECE OF ROUND TETRAFLUOROETHYLENE (TFE) TUBING AS LOOSE PIECES. THE NOMINAL TUBING DIMENSIONS SHALL BE .20 ID X .30 OD X .01 LONG.

3. DESIGN:

   A. MATERIAL: ALUMINUM CASTINGS PER QQ-A-601 OR EXTRUSIONS PER QQ-A-270. TETRAFLUOROETHYLENE TUBING PER MIL-R-8791.

   B. FINISH: CADMIUM PLATING WITH SUPPLEMENTARY OLIVE DRAB CHROMATE FILM PER QQ-P-416, CLASS 3, TYPE II.

DASH NO.	DIMENSION							DESIGNED FOR USE WITH CONNECTORS PER NASA DWG NO.
	A ±.06	B ±.005	C ±.06	D ±.005	E ±.005	F ±.06	G ±.06	
-1	2.03	.438	.53	2.780	2.460	2.03	.44	1006690
-2	3.38	.620	.72	4.128	[illegible]	3.38	.56	1006268, 1006269, 1010641, 1010642
-3	1.44	.796	.89	1.995	1.718	1.44	.44	1010411-1



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 0854 DATE 5/19/64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S.T. DATE 24 FEB 64
CHECKED APR 64
APPROVAL
APPROVAL D. O'B
APPROVAL K E B
NASA APPROVAL A.C. 5/13/64
MIT APPROVAL C Sperling 5/15/64
MIT APPROVAL 5/ /64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SHELL, POTTING
ELECTRICAL CONNECTOR, 90°
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006232
SCALE NONE
WT
SHEET 1 OF 1

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07554	4/7/64	
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 15720 DR R. Chiloso CHK Gal. APPD H. Maynard	4/14/65	KCS

NOTES:

1. GENERAL REQUIREMENTS:

   A. THESE RELAYS SHALL BE CAPABLE OF MEETING THE GENERAL REQUIREMENTS OF MIL-R-5757D IN ADDITION TO THE PARTICULAR REQUIREMENTS BELOW.

   B. THESE RELAYS SHALL BE MANUFACTURED TO MIL-Q-9858.

   C. MARKING: (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE VOLTAGE RATING. (2) INDIVIDUAL AND COLLECTIVE PACKAGING SHALL BE MARKED INTERNALLY AND EXTERNALLY PER ND 1002215 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, QUANTITY ENCLOSED, LOT CODE OR NUMBER, AND THE NASA PART NO. (DRAWING NUMBER, DASH NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:

   A. DIMENSIONS: AS DELINEATED HEREIN.

   B. ELECTRICAL CHARACTERISTICS:

      (1) PULL-IN VOLTAGE: MUST PULL IN AT 9 VDC MAXIMUM.

      (2) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

      (3) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VRMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

   C. MATERIAL CERTIFICATION: COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: (1) ONE MILLION OPERATIONS MINIMUM AT +25°C NO LOAD. (2) ONE HUNDRED THOUSAND OPERATIONS AT 25°C WITH RATED CONTACT LOADS.

   B. CONSTRUCTION:

      (1) TYPE OF ENCLOSURE: NONE - OPEN CONSTRUCTION

      (2) MATERIALS: CONTACTS, SILVER; INSULATING MATERIAL, PHENOLIC LAMINATE; TERMINALS, SOLDER DIPPED BRASS; ALL OTHER MATERIALS SHALL BE CORROSION-RESISTANT METAL OR METAL SUITABLY PLATED TO RESIST CORROSION.

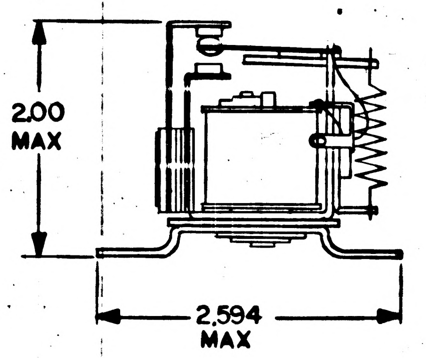
      (3) CONTACT FORM: DPDT

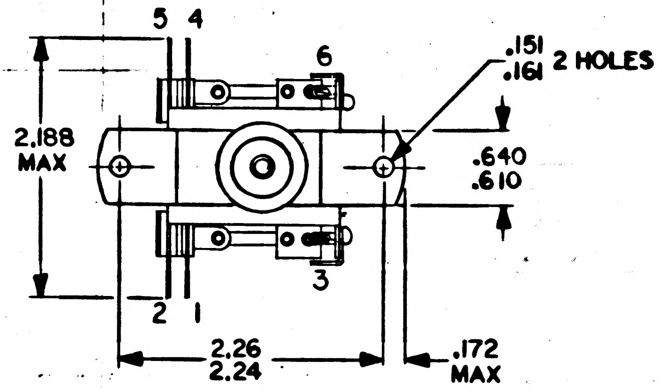
   C. RATINGS:

      (1) CONTACTS: 18 AMPERES AT 115 VRMS 60 CPS RESISTIVE LOAD
      2.6 AMPERES AT 115 VRMS 60 CPS INDUCTIVE LOAD.

      (2) COIL DISSIPATION: 1.6 WATTS NOMINAL, CONTINUOUS 6 WATTS MAXIMUM AT -45°C TO +25°C AMBIENT TEMPERATURE RANGE.

      (3) COIL VOLTAGE: 12 VDC NOMINAL.





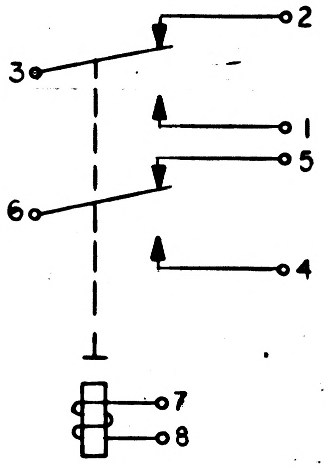


FIGURE I
SCHEMATIC

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S. T. Quiñe DATES 11 MAR 64
CHECKED TBM 11 MAR 64
APPROVAL H. W. Morse
APPROVAL
APPROVAL 3/26/64
NASA APPROVAL A. C. Metzger 4/1/64
MIT APPROVAL 4/7/64
MIT APPROVAL C. Sparling 4/5/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE, POWER, DPDT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006234
SCALE NONE
WT
SHEET 1 OF 1

1006234

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07554	4/7/64	

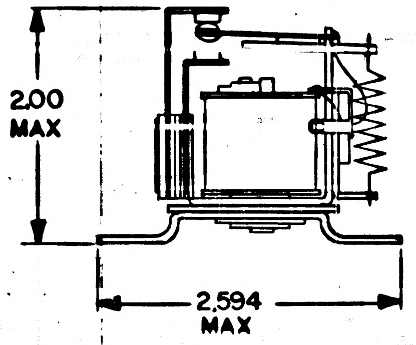
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

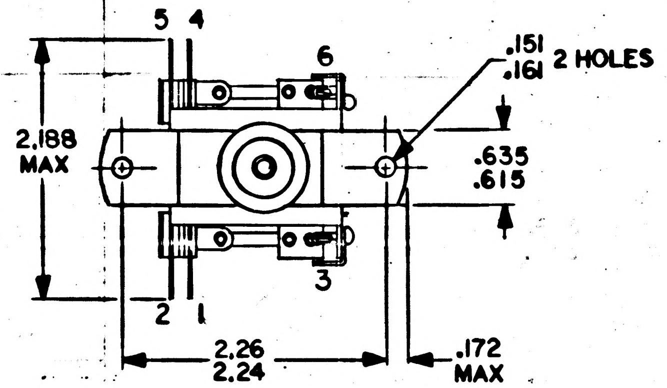
NOTES:

1. GENERAL REQUIREMENTS:
   - A. THESE RELAYS SHALL BE CAPABLE OF MEETING THE GENERAL REQUIREMENTS OF MIL-R-5757D IN ADDITION TO THE PARTICULAR REQUIREMENTS BELOW.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE VOLTAGE RATING, TERMINAL IDENTIFICATION PER FIGURE 1, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. DIMENSIONS: AS DELINEATED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) PULL-IN VOLTAGE: MUST PULL IN AT 9 VDC MAXIMUM.
     - (2) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VRMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.
   - C. MATERIAL CERTIFICATION: COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: ONE MILLION OPERATIONS MINIMUM AT +85°C WITHOUT CHANGING THE PULL-IN VOLTAGE MORE THAN 0.5 VOLTS OR CAUSING ANY OTHER MALFUNCTION WHILE SWITCHING THE RATED CONTACT LOADS.
   - B. CONSTRUCTION:
     - (1) TYPE OF ENCLOSURE: NONE - OPEN CONSTRUCTION
     - (2) MATERIALS: CONTACTS, SILVER CADMIUM OXIDE; INSULATING MATERIAL, PHENOLIC LAMINATE; TERMINALS, SOLDER DIPPED BRASS; ALL OTHER MATERIALS SHALL BE CORROSION-RESISTANT METAL OR METAL SUITABLY PLATED TO RESIST CORROSION.
     - (3) CONTACT FORM: DPDT
   - C. RATINGS:
     - (1) CONTACTS: 10 AMPERES AT 115 VRMS 60 CPS RESISTIVE LOAD
       2.6 AMPERES AT 115 VRMS 60 CPS MOTOR LOAD.
     - (2) COIL DISSIPATION: 1.6 WATTS NOMINAL, CONTINUOUS 6 WATTS MAXIMUM AT -45°C TO +85°C AMBIENT TEMPERATURE RANGE.
     - (3) COIL VOLTAGE: 12 VDC NOMINAL.





FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 07554 DATE 4/7/64

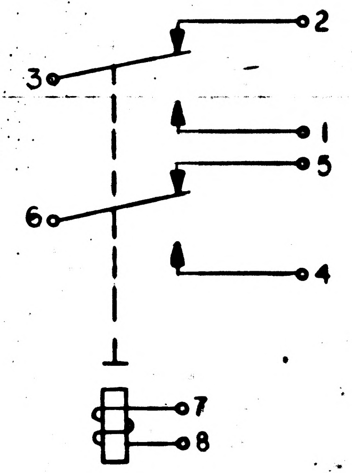


FIGURE I
SCHEMATIC

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH
SEE NOTES

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN S.T. Quifice DATES Mar 64
CHECKED T. Koenig ? KBM 11 MAR 64
APPROVAL H.W. Morse JFK
APPROVAL D. Epinger DJS
APPROVAL J. Roundtree, RHB 3/26/64
NASA APPROVAL A.C. Metzger 4/7/64
MIT APPROVAL L Kalz 4/7/64
MIT APPROVAL C Sparling 4/5/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
POWER, DPDT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006234
SCALE NONE	WT	SHEET 1 OF 1

1006234

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 07553	4/7/64	

REQUIREMENTS:

1. **GENERAL:**
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. PACKAGES SHALL BE LEGIBLY MARKED, PER ND 1002019 WITH THE MANUFACTURERS NAME AND/OR SYMBOL, AND NASA PART NUMBER (DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER).

2. **ACCEPTANCE AND INSPECTION:**
   - A. MATERIAL CERTIFICATION: COMPLIANCE WITH MATERIAL REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. MATERIAL: WHITE POLYVINYL CHLORIDE SHEET PER L-V-351 SANDWICHED BETWEEN TWO LAYERS OF POLYETHYLENE TERAPHTHALATE (MYLAR) FILM PER MIL-I-631, TYPE G, FORM F, GRADE A, CLASS I AND BONDED WITH AN ACRYLIC ADHESIVE.
   - C. APPEARANCE: THERE SHALL BE NO ROUGH OR BURRED EDGES. THERE SHALL BE NO DELAMINATION OR BLISTERING ANYWHERE WHICH EXCEEDS 0.06 IN ANY DIMENSION.
   - D. SIZE: SEE TABULATION
   - E. CONSTRUCTION: THE LAMINATED SHEET SHALL HAVE A PRESSURE SENSITIVE ADHESIVE APPLIED TO ONE SIDE WHICH SHALL HAVE A RELEASE PAPER PROTECTION.

3. **DESIGN:**
   - A. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WITHOUT THE ADHESIVE DRYING OUT
   - B. AMBIENT TEMPERATURE RANGE: -40°F TO +140°F.

DASH NO.	W X L X T* (INCHES)
-1	18 ± 1/16 X 19 ± 1/16 X .015 ± .002
-2	19 ± 1/16 X 19 ± 1/16 X .015 ± .002

* T = THICKNESS OF BASE MATERIAL

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 07553 DATE 4/7/64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DMS S.T.Dailie DATE 11 MAR 64
CHECKED J. Walkens 13 MAR 64
APPROVAL J Blackey JPK
APPROVAL
APPROVAL J Pounds RPB 3/26/64
NASA APPROVAL A. C. Metzger 4/7/64
MIT APPROVAL J Hoyt 4/7/64
MIT APPROVAL C Sparling 4/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLASTIC SHEET, LAMINATED, PRESS. SENSITIVE, ADH. BACKED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006237

SCALE NONE WT SHEET 1 OF 1

1006237

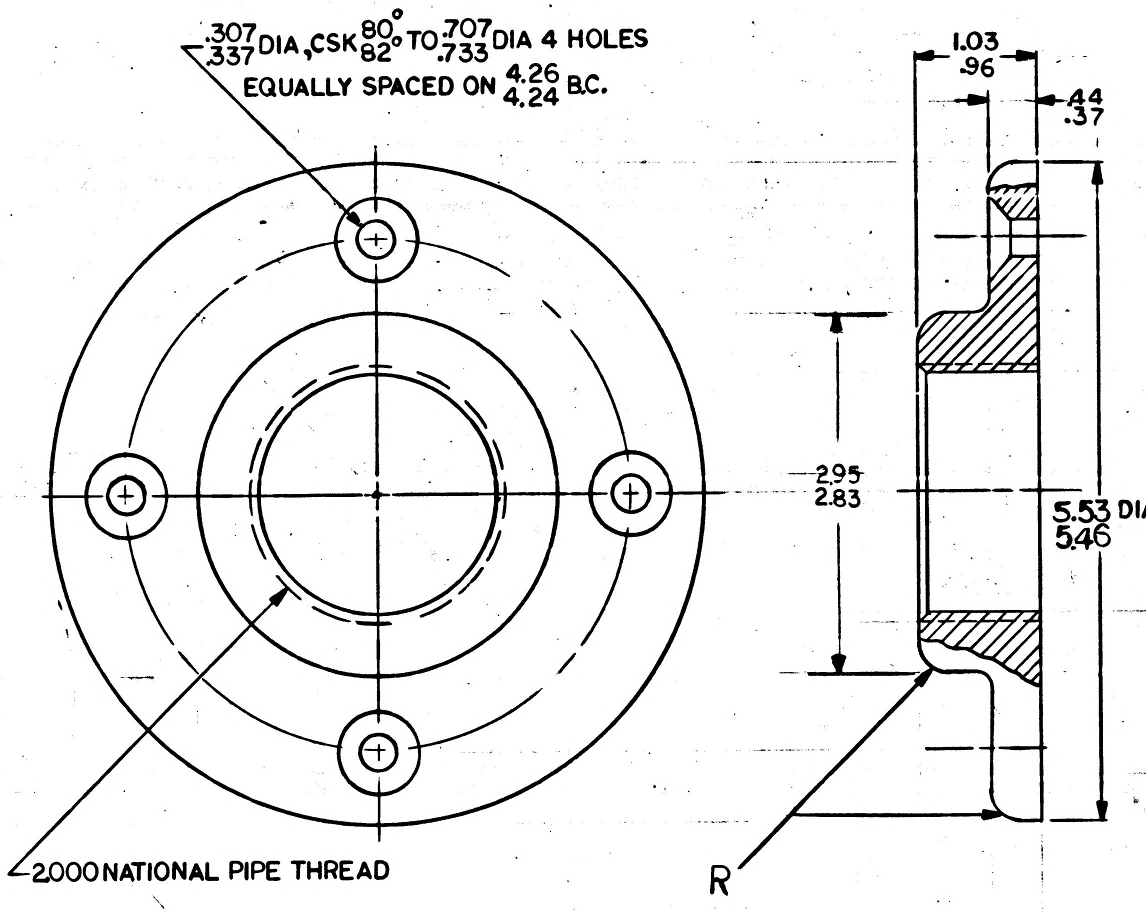
ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION. THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 11460		

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.
   - B. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY PER MIL-STD-129 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE.
2. ACCEPTANCE AND INSPECTION:
   - A. DIMENSIONS: AS SPECIFIED HEREIN.
   - B. A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
3. DESIGN:
   - A. MATERIAL AND FINISH: MALLEABLE IRON WITH A HOT ZINC DIP FINISH (GALVANIZED) PER FEDERAL SPECIFICATION QQ-I-666C.



.307/.337 DIA, CSK 80°/82° TO .707/.733 DIA 4 HOLES EQUALLY SPACED ON 4.26/4.24 B.C.
2.000 NATIONAL PIPE THREAD
1.03/.96
.44/.37
2.95/2.83
5.53/5.46 DIA
R

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 11460 DATE 8/12/64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 10JUN64
CHECKED 2JULY64
APPROVAL 3AUG64
APPROVAL 8/3/64
APPROVAL 8/3/64
NASA APPROVAL 8/12/64
MIT APPROVAL 8/12/64
MIT APPROVAL C. Sperling 8/5/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOOR FLANGE, ROUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006243
SCALE NONE WT SHEET 1 OF 1

1006243

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 11297		
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17511 DR D. Hoag CHK W. [illegible] 4-2-65 APPD [illegible]	4/1/65	KCS

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

B. MARKING:

(1) UNIT (IDENTIFICATION): MANUFACTURER'S NAMEPLATE CONTAINING THE MANUFACTURER'S NAME, ADDRESS, PART NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) SHALL APPEAR ON THE REAR OF THE UNIT (NOT ON THE FRONT PANEL).

(2) UNIT (FRONT PANEL): UNIT NAME "DIGITAL OHMMETER" AND FUNCTIONAL MARKING "SIGNAL HI, SIGNAL LO, ON, OFF, STANDBY, AND PRINT" SHALL BE SILK SCREENED BLACK CHARACTERS PER ND 1002019. SIZE SHALL BE AS DELINEATED HEREIN, OTHERWISE AS APPROPRIATE.

(3) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. ELECTRICAL:

(1) VISUAL READOUT: ALL CHARACTERS (4 DIGITS PLUS THE LETTER "K" PLUS A FIXED DECIMAL) SHALL LIGHT AS APPROPRIATE WHEN A RESISTOR OF LESS THAN 10K IS TESTED. THE FIXED DECIMAL POINT SHALL BE LOCATED BETWEEN THE FIRST AND SECOND CHARACTERS READING FROM LEFT TO RIGHT.

(2) ACCURACY OF MEASUREMENT: ± (0.01% OF READING + 1 DIGIT) OVER THE ENTIRE RANGE.

(3) RANGE OF MEASUREMENT: FROM 0.001K TO 9.999K OHMS.

(4) STABILITY: METER SHALL WARM UP WITHIN 10 MINUTES OF TURN-ON AND SHALL BALANCE FOR A GIVEN READING WITHIN 2.5 SECONDS.

(5) VOLTAGE ACROSS RESISTOR UNDER TEST: 3.30 VDC MAXIMUM, 3.00 VDC MINIMUM FOR 5000 OHMS FROM ZERO VDC AT ZERO OHMS TO 6.30 VDC MAXIMUM AT 10,000 OHMS.

3. DESIGN:

A. ELECTRICAL CHARACTERISTICS:

(1) CONTROL PULSES

PRINT COMMAND PULSE (OUTPUT): AN INTERNAL PULSE BETWEEN MINUS 6 AND MINUS 40 VDC HAVING A DURATION OF 20-500 MICROSECONDS. THE OUTPUT IMPEDANCE SHALL BE APPROXIMATELY 4000 OHMS.

READ COMMAND PULSE (INPUT): AN EXTERNAL PULSE BETWEEN MINUS 4.0 AND MINUS 8.0 VDC HAVING A DURATION OF 150-400 MICROSECONDS. SOURCE IMPEDANCE APPROXIMATELY 4000 OHMS.

(2) DATA OUTPUT: PARALLEL 1-2-4-8 BCD OUTPUT WITH A -6 TO -81 VDC "1" STATE AND A +0.3 TO -0.3 VDC "0" STATE.

(3) POWER REQUIREMENTS: 45 WATTS STANDBY, 50 WATTS BALANCING AT 115 VOLTS RMS, ± 10%, 60 CPS.

(4) SIGNAL INPUT (SIGNAL HI & SIGNAL LO): 2 INCH T-(UG1094A/U OR EQUIV) RECEPTACLES ON FRONT PANEL.

(5) SWITCH: A ROTARY, POSITIVE DETENT TYPE SWITCH HAVING AT LEAST THE FUNCTIONS OF "OFF, STANDBY, ON, AND PRINT" SHALL BE LOCATED ON THE FRONT PANEL.

B. ACCESSORIES:

(1) UNIT SHALL BE SUPPLIED WITH TWO OPERATING AND MAINTENANCE MANUALS INCLUDING THE UNIT SCHEMATIC.

(2) UNIT POWER CORD SHALL BE 5 FEET LONG APPROXIMATELY, TERMINATED AT THE UNIT END BY ANY SUITABLE 3 PRONG CONNECTOR AND THE OTHER END SHALL BE AN MS3106R-20-4P CONNECTOR WITH BUSHING AND ADAPTER.

(3) UNIT SIGNAL OUTPUT SHALL BE THROUGH A 20-24 INCH CABLE WHICH PLUGS INTO THE REAR OF THE UNIT. THE UNIT END OF THE CABLE IS TERMINATED IN AN AMPHENOL 36 PIN PLUG (PART NUMBER 57-30360) WHICH MATES WITH AN AMPHENOL RECEPTACLE (PART NUMBER 57-40360). THE FREE END OF THE CABLE HAS AN AMPHENOL 50 PIN PLUG (PART NUMBER 57-30500) AND SHALL BE COMPATIBLE WITH THE INPUT CONNECTOR & CIRCUITRY OF RECORDER NASA DWG NO. 1006965.

C. FRONT PANEL SCREWS SHALL BE MS35200 CROSS-RECESSED FLAT HEAD WHERE POSSIBLE, OTHERWISE MS35216 PAN HEAD SCREWS.

D. FUNCTION SWITCH KNOB ON THE FRONT PANEL TO BE PER MS91528, BLACK MATTE FINISH.

E. FINISH, PROTECTIVE: PANEL SHALL BE FINISHED BY PAINTING THE FRONT AND EDGES WITH ONE COAT OF SEMI-GLOSS ENAMEL (TT-E-529, CLASS B, COLOR 26440 OF FED-STD-595) PER MIL-F-14072 P513, TYPE I EXCEPT THE CHROMATE FILM SHALL BE ELECTRICALLY CONDUCTIVE.

F. VISUAL READOUT: CHARACTERS SHALL BE ONE INCH HIGH GOTHIC OF STANDARD (NOT EXTENDED OR COMPRESSED) PROPORTION. THEY SHALL BE CAPABLE OF BEING READ UNDER BRIGHT ROOM CONDITIONS (100 FOOT-CANDLE OVERHEAD ILLUMINATION) FROM 30 DEGREES OFF THE NORMAL IN ANY DIRECTION.

4. PREPARATION FOR DELIVERY PER ND1002215

ORIGINAL SOURCE OF SUPPLY:

NON-LINEAR SYSTEMS, INC.
BOX 278
DEL-MAR, CALIFORNIA
MODEL 784 REV A

PROCURE ONLY FROM APPROVED SOURCES

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S. T. [illegible] DATE 2 Jun 64
CHECKED [illegible] 20 Jul 64
APPROVAL D. O'Bryant
APPROVAL
APPROVAL 7-27-64
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL C. Sparling 7/30/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

OHMMETER, DIGITAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006244
SCALE NONE
WT
SHEET 1 OF 2

1006244

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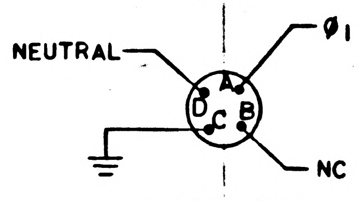
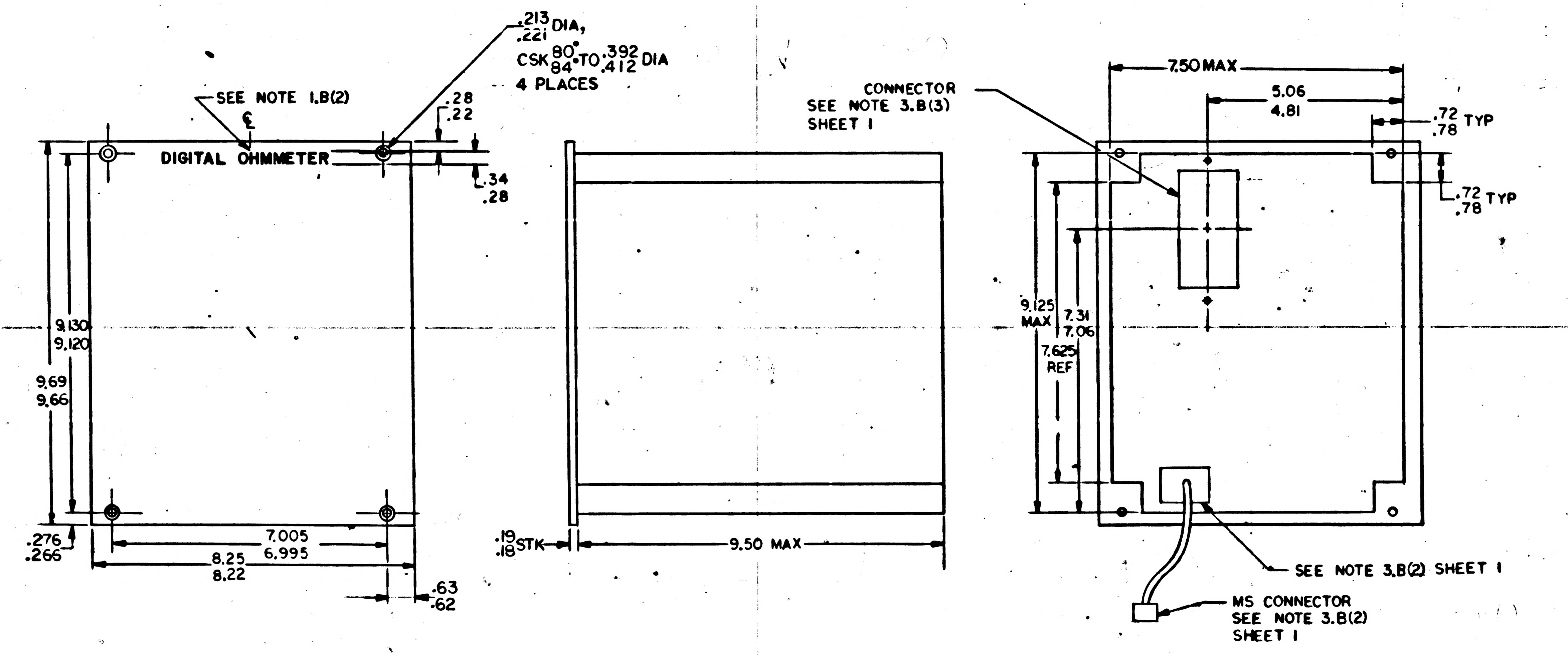
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 11297		
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17511 DR CHK W. Lyons 4-8-65 APPD A. Maynard	4-8-	KCS


NEUTRAL
Ø1
A
B
C
D
NC

AC CORD PLUG
WIRING DIAGRAM
FIGURE 1


.213 .221 DIA,
CSK 80° 84° TO .392 .412 DIA
4 PLACES
SEE NOTE 1.B(2)
℄
DIGITAL OHMMETER
.28 .22
.34 .28
9.130 9.120
9.69 9.66
.276 .266
7.005 6.995
8.25 8.22
.63 .62
.19 .18 STK
9.50 MAX
CONNECTOR
SEE NOTE 3.B(3)
SHEET 1
7.50 MAX
5.06 4.81
.72 .78 TYP
.72 .78 TYP
9.125 MAX
7.31 7.06
7.625 REF
SEE NOTE 3.B(2) SHEET 1
MS CONNECTOR
SEE NOTE 3.B(2)
SHEET 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 22 Jun 64
CHECKED Jun 64
APPROVAL 27 July 64
APPROVAL
APPROVAL 7-27-64
NASA APPROVAL 8/4/64
MIT APPROVAL
MIT APPROVAL C. Sowling 7/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

OHMMETER, DIGITAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006244
SCALE NONE WT SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006244

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 11297		

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REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING:

(1) UNIT (IDENTIFICATION): MANUFACTURER'S NAMEPLATE CONTAINING THE MANUFACTURER'S NAME, ADDRESS, PART NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) SHALL APPEAR ON THE REAR OF THE UNIT (NOT ON THE FRONT PANEL).

(2) UNIT (FRONT PANEL): UNIT NAME "DIGITAL OHMMETER" AND FUNCTIONAL MARKING "SIGNAL HI, SIGNAL LO, ON, OFF, STANDBY, AND PRINT" SHALL BE SILK SCREENED BLACK CHARACTERS PER ND 1002019. SIZE SHALL BE AS DELINEATED HEREIN, OTHERWISE AS APPROPRIATE.

(3) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. ELECTRICAL:

(1) VISUAL READOUT: ALL CHARACTERS (4 DIGITS PLUS THE LETTER "K" PLUS A FIXED DECIMAL) SHALL LIGHT AS APPROPRIATE WHEN A RESISTOR OF LESS THAN 10K IS TESTED. THE FIXED DECIMAL POINT SHALL BE LOCATED BETWEEN THE FIRST AND SECOND CHARACTERS READING FROM LEFT TO RIGHT.

(2) ACCURACY OF MEASUREMENT: ± (0.01% OF READING + 1 DIGIT) OVER THE ENTIRE RANGE.

(3) RANGE OF MEASUREMENT: FROM 0.001K TO 9.999K OHMS.

(4) STABILITY: METER SHALL WARM UP WITHIN 10 MINUTES OF TURN-ON AND SHALL BALANCE FOR A GIVEN READING WITHIN 2.5 SECONDS.

(5) VOLTAGE ACROSS RESISTOR UNDER TEST: 3.30 VDC MAXIMUM, 3.00 VDC MINIMUM FOR 5000 OHMS FROM ZERO VDC AT ZERO OHMS TO 6.30 VDC MAXIMUM AT 10,000 OHMS.

3. DESIGN:

A. ELECTRICAL CHARACTERISTICS:

(1) CONTROL PULSES

PRINT COMMAND PULSE (OUTPUT): AN INTERNAL PULSE BETWEEN MINUS 6 AND MINUS 40 VDC HAVING A DURATION OF 20-500 MICROSECONDS. THE OUTPUT IMPEDANCE SHALL BE APPROXIMATELY 4000 OHMS.

READ COMMAND PULSE (INPUT): AN EXTERNAL PULSE BETWEEN MINUS 4.0 AND MINUS 8.0 VDC HAVING A DURATION OF 150-400 MICROSECONDS. SOURCE IMPEDANCE APPROXIMATELY 4000 OHMS.

(2) DATA OUTPUT: PARALLEL 1-2-4-8 BCD OUTPUT WITH A -6 TO -81 VDC "1" STATE AND A +0.3 TO -0.3 VDC "0" STATE.

(3) POWER REQUIREMENTS: 45 WATTS STANDBY, 50 WATTS BALANCING AT 115 VOLTS RMS, ± 10%, 60 CPS.

(4) SIGNAL INPUT (SIGNAL HI & SIGNAL LO): 2 INCH (UG1094A/U OR EQUIV) RECEPTACLES ON FRONT PANEL.

(5) SWITCH: A ROTARY, POSITIVE DETENT TYPE SWITCH HAVING AT LEAST THE FUNCTIONS OF "OFF, STANDBY, ON, AND PRINT" SHALL BE LOCATED ON THE FRONT PANEL.

B. ACCESSORIES:

(1) UNIT SHALL BE SUPPLIED WITH TWO OPERATING AND MAINTENANCE MANUALS INCLUDING THE UNIT SCHEMATIC.

(2) UNIT POWER CORD SHALL BE 5 FEET LONG APPROXIMATELY, TERMINATED AT THE UNIT END BY ANY SUITABLE 3 PRONG CONNECTOR AND THE OTHER END SHALL BE AN MS3106R-20-4P CONNECTOR WITH BUSHING AND ADAPTER.

(3) UNIT SIGNAL OUTPUT SHALL BE THROUGH A 20-24 INCH CABLE WHICH PLUGS INTO THE REAR OF THE UNIT. THE UNIT END OF THE CABLE IS TERMINATED IN AN AMPHENOL 36 PIN PLUG (PART NUMBER 57-30360) WHICH MATES WITH AN AMPHENOL RECEPTACLE (PART NUMBER 57-40360). THE FREE END OF THE CABLE HAS AN AMPHENOL 50 PIN PLUG (PART NUMBER 57-30500) AND SHALL BE COMPATIBLE WITH THE INPUT CONNECTOR & CIRCUITRY OF RECORDER NASA DWG NO. 1006965.

C. FRONT PANEL SCREWS SHALL BE MS35200 CROSS-RECESSED FLAT HEAD WHERE POSSIBLE, OTHERWISE MS35216 PAN HEAD SCREWS.

D. FUNCTION SWITCH KNOB ON THE FRONT PANEL TO BE PER MS91528, BLACK MATTE FINISH.

E. FINISH, PROTECTIVE: PANEL SHALL BE FINISHED BY PAINTING THE FRONT AND EDGES WITH ONE COAT OF SEMI-GLOSS ENAMEL (TT-E-529, CLASS B, COLOR 26440 OF FED-STD-595) PER MIL-F-14072 P513, TYPE I EXCEPT THE CHROMATE FILM SHALL BE ELECTRICALLY CONDUCTIVE.

F. VISUAL READOUT: CHARACTERS SHALL BE ONE INCH HIGH GOTHIC OF STANDARD (NOT EXTENDED OR COMPRESSED) PROPORTION. THEY SHALL BE CAPABLE OF BEING READ UNDER BRIGHT ROOM CONDITIONS (100 FOOT-CANDLE OVERHEAD ILLUMINATION) FROM 30 DEGREES OFF THE NORMAL IN ANY DIRECTION.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 11297 DATE 8/4/64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S. T. [illegible] DATE 2 JUL 64
CHECKED [illegible] 20 JUL 64
APPROVAL D. O'Bryant
APPROVAL H W Moore
APPROVAL 7-27-64
NASA APPROVAL 8/4/64
MIT APPROVAL Aug 64
MIT APPROVAL C Sperling 7/30/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

OHMMETER, DIGITAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006244
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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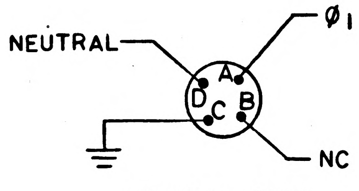
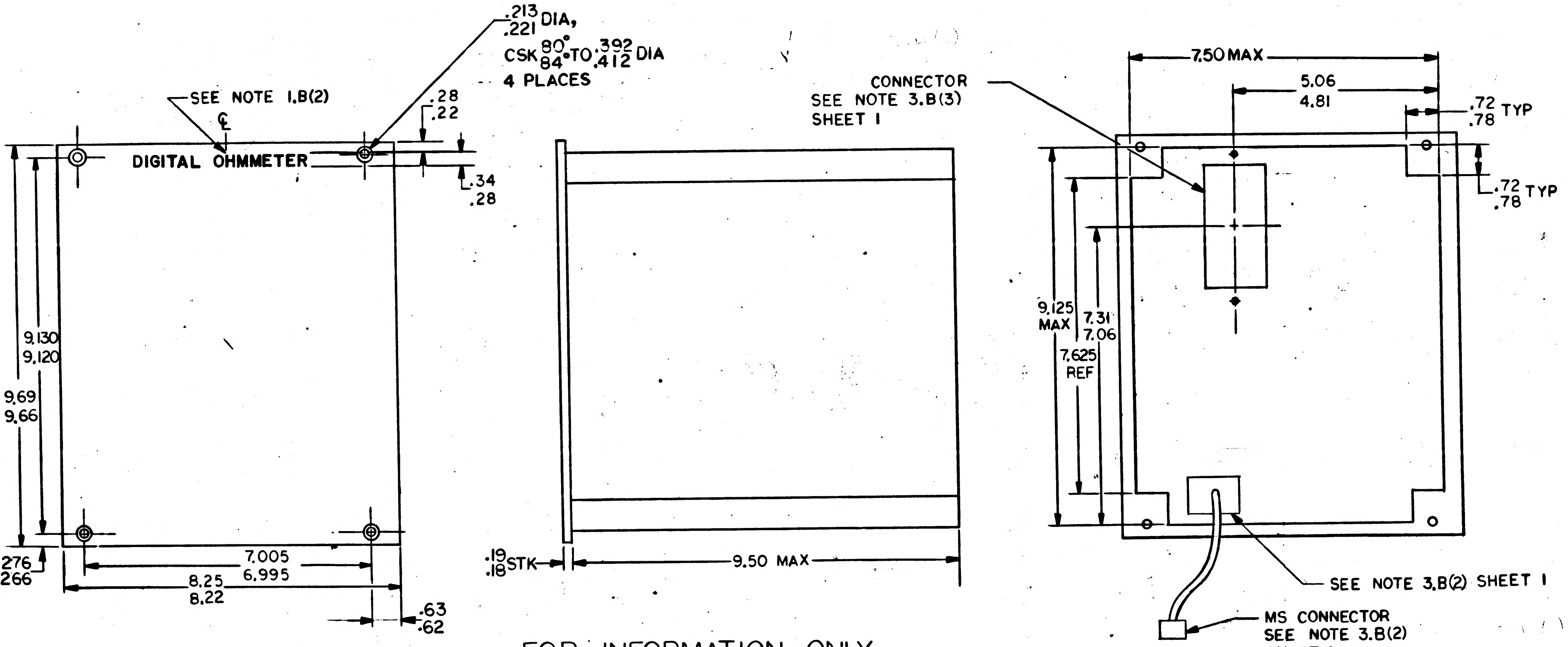
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 11297		


NEUTRAL
⌀1
A
B
C
D
NC

AC CORD PLUG
WIRING DIAGRAM
FIGURE 1


.213 .221 DIA,
CSK 80° 84° TO .392 .412 DIA
4 PLACES
SEE NOTE 1.B(2)
℄
DIGITAL OHMMETER
.28 .22
.34 .28
9.130 9.120
9.69 9.66
.276 .266
7.005 6.995
8.25 8.22
.63 .62
.19 .18 STK
9.50 MAX
CONNECTOR
SEE NOTE 3.B(3)
SHEET 1
7.50 MAX
5.06 4.81
.72 .78 TYP
.72 .78 TYP
9.125 MAX
7.31 7.06
7.625 REF
SEE NOTE 3.B(2) SHEET 1
MS CONNECTOR
SEE NOTE 3.B(2)
SHEET 1

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 11297 DATE 8/4/64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN G.A. Beal DATE 22 JUN 64
CHECKED 30 JUN 64
APPROVAL D. 27 JULY 64
APPROVAL H. Moore V.C.
APPROVAL 7-27-64
NASA APPROVAL 8/4/64
MIT APPROVAL W. 4 Aug 64
MIT APPROVAL C. Sperling 7/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

OHMMETER, DIGITAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006244
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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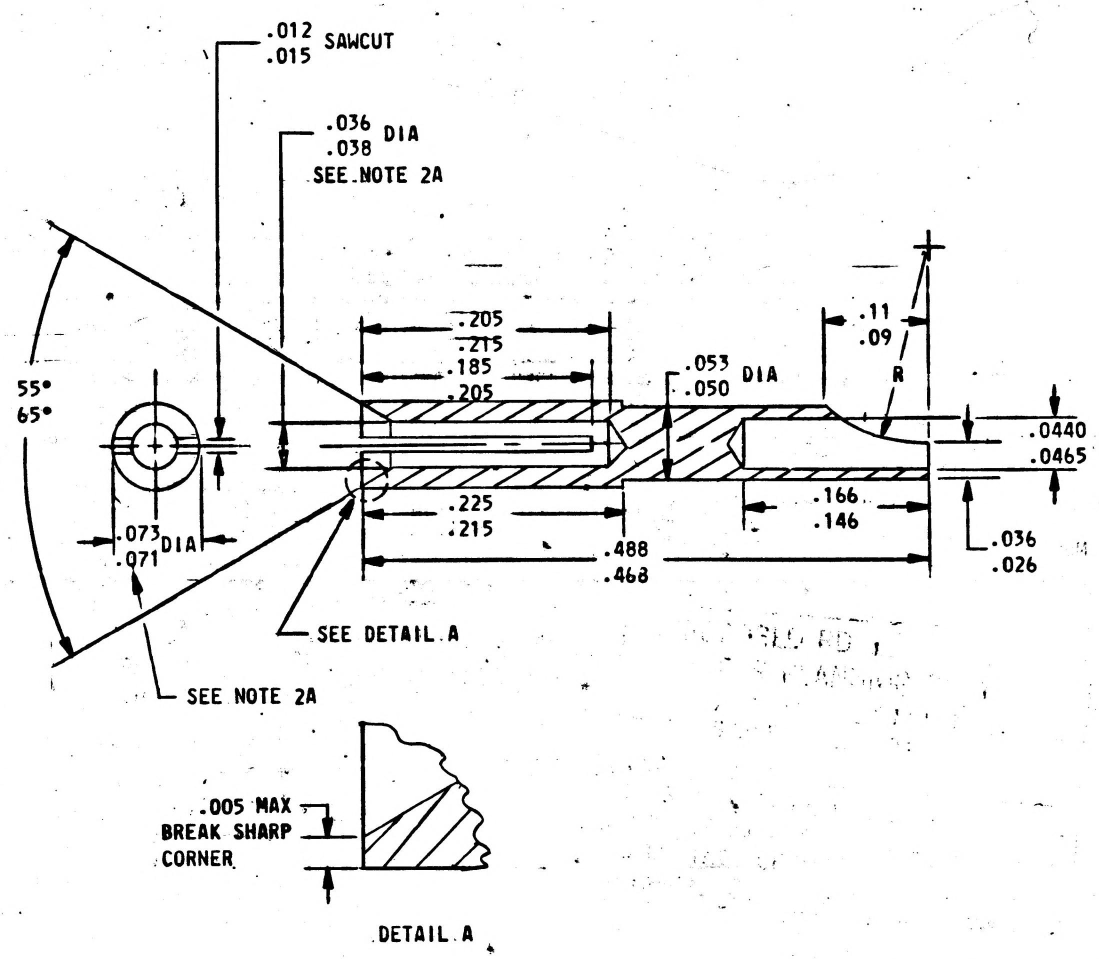
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 13151	9/30/64	

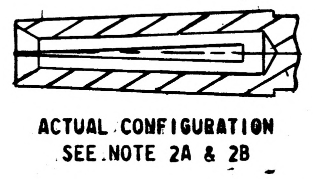
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION. THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PART NUMBER, LOT NUMBER OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).
2. ACCEPTANCE AND INSPECTION:
   - A. DIMENSIONS: AS DELINEATED HEREIN WHEN A SQUARE GAGE PIN OF .0262 ACROSS FLATS IS INSERTED INTO THE CRIMPED HOLE. A ROUND GAGE PIN OF .037 DIAMETER MAY BE USED AS AN EQUIVALENT.
   - B. PIN RETENTION: THESE CONTACTS SHALL BE CRIMPED AS SHOWN SO THAT A SQUARE PIN .023 ACROSS FLATS (.0335 DIA REF) SHALL BE RETAINED AND A PIN .027 ACROSS FLATS (.0382 DIA REF) SHALL NOT CAUSE PERMANENT DEFORMATION.
   - C. CERTIFICATION: A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
3. DESIGN:
   - A. MATERIALS: PHOSPHOR BRONZE PER QQ-P-330, COMPOSITION A, SPRING TEMPER.
   - B. FINISH: 30 MILLIONTHS MINIMUM HARD GOLD PLATE PER MIL-G-45204, TYPE II OVER 200-300 MILLIONTHS OF SILVER PLATE PER QQ-S-365.
   - C. BURRS AND SHARP EDGES: REMOVE BURRS AND SHARP EDGES ALL OVER.



DETAIL A



ACTUAL CONFIGURATION
SEE NOTE 2A & 2B

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 13151 DATE 9/30/64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034
FOR THIS DRAWING.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT SEE NOTE
FINAL FINISH SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN W. L. Jones DATE 15SEP64
CHECKED J. D. Feman 18 SEP 64
APPROVAL A. J. Pikas 21 Sept 64
APPROVAL D. O'Bryant 21 Sept 64
APPROVAL M. J. B. 9-21-64
NASA APPROVAL W. J. Rhine 9-30-64
MIT APPROVAL W. Kupfer 30 Sep 64
MIT APPROVAL C. Sperling 9/2/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL, FEMALE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006248
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 13690	10/2[illegible]	

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PART NUMBER, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION:

A. DIMENSIONS: AS DELINEATED

B. GEOMETRY: IN GENERAL, ALL FEATURES OF THE PART SHALL BE SYMMETRICAL AND FULLY FORMED. THE HOLDING RING, . THE CLINCHING RING, AND THE ANTI-ROTATE SERPENTINE RING SHALL BE CONCENTRIC WITH THE TAPPED HOLE AND WITH EACH OTHER WITHIN 0.005 TIR. A PLANE PASSING THRU THE PERIPHERAL EDGE OF ANY OF THESE RINGS SHALL BE SQUARE WITH THE AXIAL CENTERLINE OF THE THREAD AND PARALLEL WITH SURFACE D WITHIN (1°) ONE DEGREE TIR.

C. CERTIFICATION: A CERTIFICATION OF COMPLIANCE WITH THE MINIMUM HARDNESS AND ELECTROPLATED FINISH DESIGN REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. MATERIAL & HARDNESS: THE BASE MATERIAL SHALL BE A CARBON STEEL, HEAT TREATED OR OTHERWISE HARDENED (WORK OR CASE HARDENED) SO THAT THE PARTS MAY BE INSTALLED IN ALMOST ANY MATERIAL HAVING A HARDNESS EQUAL TO OR LESS THAN ROCKWELL B85. NOTE: MAGNESIUM IS SPECIFICALLY EXCLUDED AS A MOUNTING MATERIAL.

INSTALLATION SHALL MEAN APPLICATION OF A NORMAL STEADY PRESSURE TO SURFACE D, WITH THE HOLDING RING STARTED INTO A RECOMMENDED MOUNTING HOLE, SUFFICIENT TO FORCE THE SERPENTINE RING JUST BELOW THE MOUNTING SURFACE. PROPERLY INSTALLED, THE NUT SHALL WITHSTAND AN AXIAL PUSHOUT FORCE EQUAL TO 50% OF THE INSTALLING FORCE AND A TORQUE SUFFICIENT TO STRIP THE NUT THREADS WITHOUT PUSHING OR TURNING LOOSE IN THE MOUNTING SHEET.

B. FINISH: CADMIUM ELECTROPLATE PLUS A CHROMATE CONVERSION COATING PER QQ-P-416, TYPE II, CLASS 3.

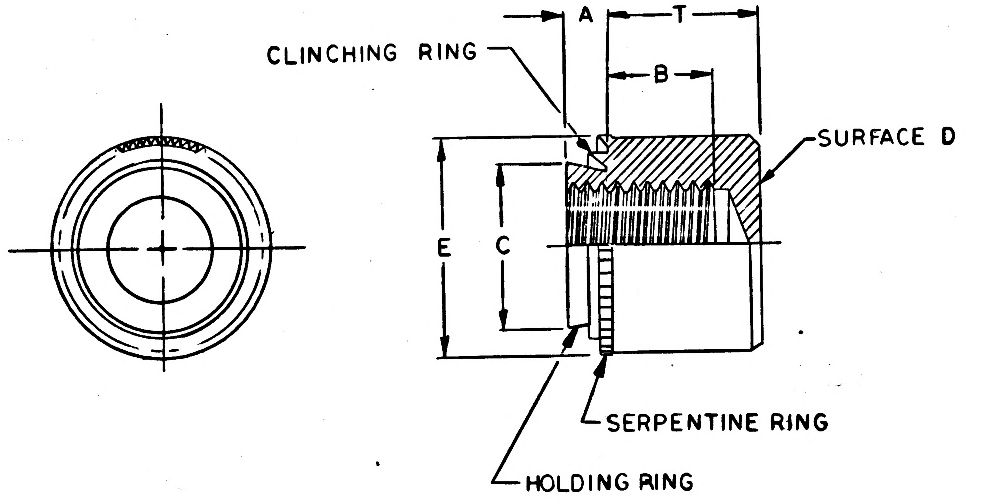

TABLE I

DASH NO.	THREAD SIZE	DIMENSIONS A MAX	FOR SHEET THICKNESS	C MAX	MOUNTING HOLE +.003-.000	E +.015 -.005	T ±.03	B ±.03	MINIMUM DISTANCE ℄ HOLE TO EDGE OF SHEET
-001 -002 -003	NO. 4 (.112)-40 UNC-2B	.038 .054 .087	.040-.055 .056-.090 .091-UP	.164	.166	.250	.38	.19	.19
-004 -005 -006	NO. 6 (.138)-32 UNC-2B	.038 .054 .087	.040-.055 .056-.090 .091-UP	.185	.188	.312	.38	.19	.22
-007 -008 -009	NO. 8 (.164)-32 UNC-2B	.038 .054 .087	.040-.055 .056-.090 .091-UP	.210	.213	.344	.44	.25	.26
-010 -011 -012	NO. 10 (.190)-24 UNC-2B	.038 .054 .087	.040-.055 .056-.090 .091-UP	.247	.250	.375	.44	.25	.28
-013 -014 -015	NO. 10 (.190)-32 UNF-2B	.038 .054 .087	.040-.055 .056-.090 .091-UP	.247	.250	.375	.44	.25	.28
-016 -017 -018	.250-20UNC-2B	.054 .087 .120	.056-.090 .091-.124 .125-UP	.342	.344	.500	.56	.31	.34

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 13690 DATE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE
HEAT TREATMENT SEE NOTE
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775

DRAWN DW James DATE 8 OCT 64
CHECKED Horn Adrian 9 OCT 64
APPROVAL R. Quilitto 10/12/64
APPROVAL A. J. Peters 10/12/64
APPROVAL 10/12/64
NASA APPROVAL G. C. Mitchell 10/20/64
MIT APPROVAL 10/20/64
MIT APPROVAL C. Sperling 10/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NUT, PLAIN, SELF CLINCHING, CAP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006249
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

— 1006256

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 15088	12/23/64	WK

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

B. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I.

(1) SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH PARAGRAPHS 3.5.1 & 3.5.2 OF ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

(2) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

A. APPLIED LIFE: INDEFINITE WHEN APPLIED TO RIGID POLYVINYL CHLORIDE SHEET AND PROPERLY DRIED. THERE SHALL BE NO FADING, CRACKING, FLAKING OR SMEARING WHEN EXPOSED TO TEMPERATURES BELOW +120°F AND RELATIVE HUMIDITY BELOW 95%.

B. STORAGE LIFE: 3 YEARS MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL CONTAINERS AT TEMPERATURES BELOW 80°F.

C. PHYSICAL PROPERTIES:

(1) SPECIFIC GRAVITY: 0.8580 AT 20°C.

(2) VISCOSITY: 15-20 CENTIPOISES AT 20°C USING A BROOKFIELD VISCOMETER AT 60 RPM WITH SPINDLE NO. 1.

(3) SOLIDS CONTENT: 20.5% NOMINAL

(4) RESINS: 7.7% NOMINAL

(5) COLORS: OPAQUE COLORS IN ACCORDANCE WITH TABLE I.

(6) DRYING TIME: 30 SECONDS MAXIMUM AT 75°F AND 50% RELATIVE HUMIDITY. ULTIMATE HARDNESS WILL BE ACHIEVED IN APPROXIMATELY 4 HOURS WHICH WILL ASSURE WATERPROOF QUALITIES.

TABLE I

DASH NO.	COLOR
-001	BLACK
-002	BROWN
-003	RED
-004	ORANGE
-005	YELLOW
-006	GREEN
-007	BLUE
-008	PURPLE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL NONE

HEAT TREATMENT NONE

FINAL FINISH NONE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775

DRAWN D. [illegible] DATE 20 NOV 64
CHECKED R.T. [illegible] 20 NOV
APPROVAL D. [illegible] 12/14/64
APPROVAL A.G. Pika 12/14/64
APPROVAL [illegible] 12/14/64
NASA APPROVAL W.J. Rhyne 12-23-64
MIT APPROVAL [illegible] 23 Dec 64
MIT APPROVAL C. Sabling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INK, MARKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006256
SCALE NONE	WT	SHEET 1 OF 1

1006256

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1006257 A

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/29/64	wk
A	REVISED PER TDRR 16753 DR A. Katula CHK A. Hogan APPD A. Maynard	3/3/65	KZB

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-3786A AND THE SPECIFIC REQUIREMENTS HEREIN.

B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

~~C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~

D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), DECK IDENTIFICATION AND TERMINAL IDENTIFICATION ON EACH DECK AS SHOWN.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING FOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.5.1 AND 3.5.2 OF ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) DETENT ACTION AND SWITCH TORQUE: UNITS SHALL HAVE A DEFINITE DETENT ACTION (30° INDEX) AND THE SWITCHING TORQUE SHALL BE WITHIN 20 AND 150 OUNCE-INCHES.

(3) STOPS: MECHANICAL STOPS, LIMITING TRAVEL TO 90°, SHALL WITHSTAND 50 POUND-INCHES OF TORQUE.

(4) MARKING: IN ACCORDANCE WITH PARAGRAPH 1.D.

B. ELECTRICAL CHARACTERISTICS:

(1) SWITCH FORM: 8 POLE (4 POLES/DECK, 2 DECKS), 4 POSITION (30° APART REFERENCE), NON-SHORTING.

(2) CONTACT RESISTANCE: 0.005 OHMS MAXIMUM (0.010 MAXIMUM INITIAL RESISTANCE) AT 100 MILLIAMPERES DIRECT CURRENT WHEN A POTENTIAL OF 2 VOLTS IS APPLIED THROUGH A SUITDROPPING RESISTOR PER MIL-STD-202C, METHOD 307. 10 ACTUATIONS SHALL BE MADE PRIOR TO MEASUREMENT.

(3) CAPACITANCE (CONTACT-CONTACT & CONTACT-SLIPRING): 2.5 PICOFARADS MAXIMUM AT 1.0 KILOCYCLE PER MIL-STD-202C, METHOD 305.

(4) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VOLTS RMS BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

(5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VDC BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF THIS SCD.

~~(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.~~

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) CONTACT CURRENT RATING (CONTINUOUS): 10 AMPERES RMS MAXIMUM.

(2) CONTACT CURRENT RATING (SWITCHING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CPS, RESISTIVE LOAD.

B. OPERATING LIFE: 10,000 CYCLES MINIMUM.

C. CONSTRUCTION:

(1) WIPER BLADES: MULTILEAF TYPE

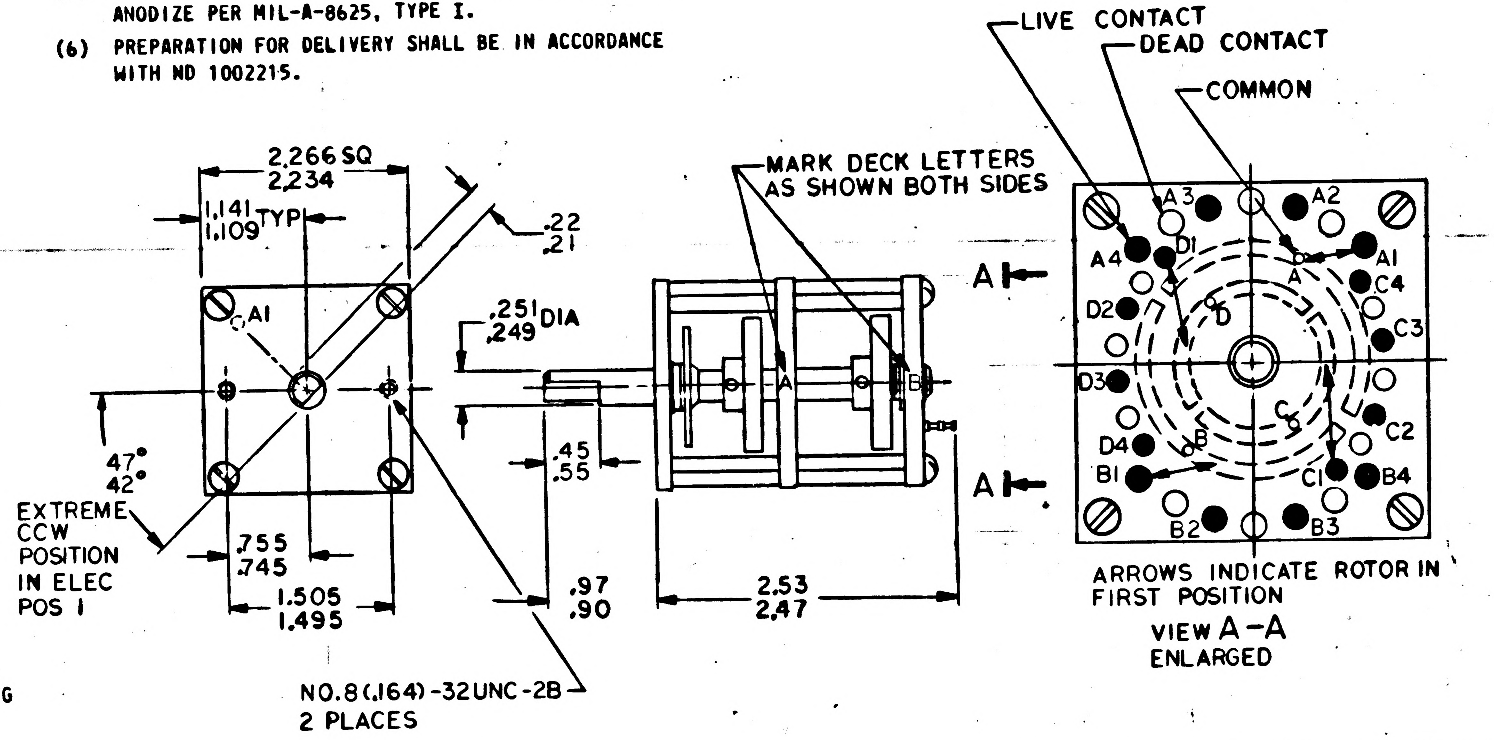
(2) CONTACT AREAS: TREATED WITH A HIGH MOLE ESTER LUBRICANT.

(3) TERMINALS: SILVER ALLOY (90% Ag - 10% Cu), GOLD PLATED. SHALL ACCOMODATE 2 NO. 20 AWG STRANDED CONDUCTORS.

(4) TERMINAL BOARDS: PAPER BASE EPOXY RESIN PER MIL-P-22324, TYPE PEE.

(5) MOUNTING PLATE: ALUMINUM ALLOY PER QQ-A-250/4 & ANODIZE PER MIL-A-8625, TYPE I.

(6) PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN DATE 9 DEC 64
CHECKED R. T. 14 DEC 64
APPROVAL D. D'Bryant 12/23/64
APPROVAL A. Petka 12/23/64
APPROVAL 12/23/64
NASA APPROVAL 12-28-64
MIT APPROVAL 29 Dec 64
MIT APPROVAL C. Sperling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
4 POSITION/POLE, 4 POLES/DECK, 2 DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006257
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006257 A

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1006257 B

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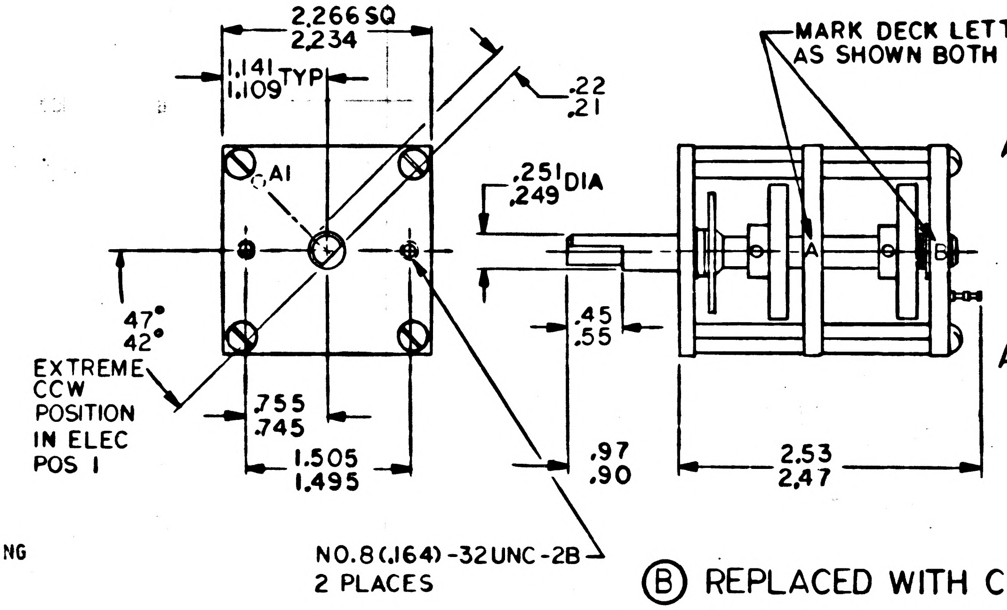
REVISIONS

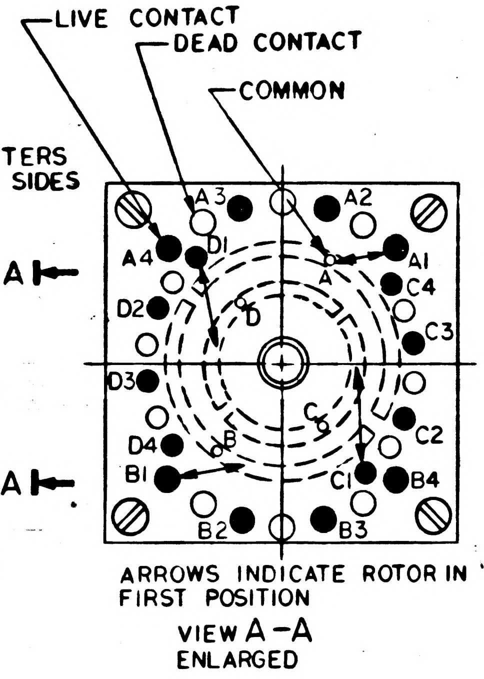
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/29/64	wk
A	REVISED PER TDRR 16753 DR A. Katz CHK A. Lagu APPD H Maynard	3/3/65	KZB
B	REPLACED WITH CHANGE PER TDRR 20224 DR J Doty CHK Gleason APPD H Maynard		DAB 1 Jul 65

REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-3786A AND THE SPECIFIC REQUIREMENTS HEREIN.
   - B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - ~~C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
   - D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), DECK IDENTIFICATION AND TERMINAL IDENTIFICATION ON EACH DECK AS SHOWN.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING FOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.5.1 AND 3.5.2 OF ND 1002215.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) DETENT ACTION AND SWITCH TORQUE: UNITS SHALL HAVE A DEFINITE DETENT ACTION (30° INDEX) AND THE SWITCHING TORQUE SHALL BE WITHIN 20 AND 150 OUNCE-INCHES.
     - (3) STOPS: MECHANICAL STOPS, LIMITING TRAVEL TO 90°, SHALL WITHSTAND 50 POUND-INCHES OF TORQUE.
     - (4) MARKING: IN ACCORDANCE WITH PARAGRAPH 1.D.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) SWITCH FORM: 8 POLE (4 POLES/DECK, 2 DECKS), 4 POSITION (30° APART REFERENCE), NON-SHORTING.
     - (2) CONTACT RESISTANCE: 0.005 OHMS MAXIMUM (0.010 MAXIMUM INITIAL RESISTANCE) AT 100 MILLIAMPERES DIRECT CURRENT WHEN A POTENTIAL OF 2 VOLTS IS APPLIED THROUGH A SUITDROPPING RESISTOR PER MIL-STD-202C, METHOD 307. 10 ACTUATIONS SHALL BE MADE PRIOR TO MEASUREMENT.
     - (3) CAPACITANCE (CONTACT-CONTACT & CONTACT-SLIPRING): 2.5 PICOFARADS MAXIMUM AT 1.0 KILOCYCLE PER MIL-STD-202C, METHOD 305.
     - (4) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VOLTS RMS BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.
     - (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VDC BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:
     - (1) CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF THIS SCD.
     - ~~(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.~~
3. DESIGN:
   - A. ELECTRICAL RATINGS:
     - (1) CONTACT CURRENT RATING (CONTINUOUS): 10 AMPERES RMS MAXIMUM.
     - (2) CONTACT CURRENT RATING (SWITCHING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CPS, RESISTIVE LOAD.
   - B. OPERATING LIFE: 10,000 CYCLES MINIMUM.
   - C. CONSTRUCTION:
     - (1) WIPER BLADES: MULTILEAF TYPE
     - (2) CONTACT AREAS: TREATED WITH A HIGH MOLE ESTER LUBRICANT.
     - (3) TERMINALS: SILVER ALLOY (90% Ag - 10% Cu), GOLD PLATED. SHALL ACCOMODATE 2 NO. 20 AWG STRANDED CONDUCTORS.
     - (4) TERMINAL BOARDS: PAPER BASE EPOXY RESIN PER MIL-P-22324, TYPE PEE.
     - (5) MOUNTING PLATE: ALUMINUM ALLOY PER QQ-A-250/4 & ANODIZE PER MIL-A-8625, TYPE I.
     - (6) PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.





ARROWS INDICATE ROTOR IN FIRST POSITION

VIEW A-A
ENLARGED

Ⓑ REPLACED WITH CHANGE BY REV C

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
NONE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN D. Nowak DATE 9 DEC 64
CHECKED R.T. Dvorak HSM 14 Dec 64
APPROVAL D. O'Bryant 12/23/64
APPROVAL A. Petka 12/23/64
APPROVAL 11/1/64
NASA APPROVAL W. J. Rice 12-28-64
MIT APPROVAL W. Crepps 29 Dec 64
MIT APPROVAL C. Sperling 11/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
4 POSITION/POLE, 4 POLES/DECK, 2 DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006257
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006257 B

1006257 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
C	REPLACES REV B WITH CHANGE PER TDRR 20284		

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-3786A AND THE SPECIFIC REQUIREMENTS HEREIN.

B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

C. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MD 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), DECK IDENTIFICATION AND TERMINAL IDENTIFICATION ON EACH DECK AS SHOWN.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MD 1002215, CLASS I, CODE 1.

(1) MARKING FOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.5.1 AND 3.5.2 OF MD 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) DETENT ACTION AND SWITCH TORQUE: UNITS SHALL HAVE A DEFINITE DETENT ACTION (30° INDEX) AND THE SWITCHING TORQUE SHALL BE PER CHART.

(3) STOPS: MECHANICAL STOPS LIMITING TRAVEL PER CHART.

(4) MARKING: IN ACCORDANCE WITH PARAGRAPH 1.C.

B. ELECTRICAL CHARACTERISTICS:

(1) SWITCH FORM: 4 POLES/DECK, NO. OF DECKS & POSITIONS PER CHART, NON-SHORTING, 30 DEGREE INDEX.

(2) CONTACT RESISTANCE: 0.005 OHMS MAXIMUM (0.010 MAXIMUM INITIAL RESISTANCE) AT 100 MILLIAMPERES DIRECT CURRENT WHEN A POTENTIAL OF 2 VOLTS IS APPLIED THROUGH A SUIT-DROPPING RESISTOR PER MIL-STD-202C, METHOD 307. 10 ACTUATIONS SHALL BE MADE PRIOR TO MEASUREMENT.

(3) CAPACITANCE (CONTACT-CONTACT & CONTACT-SLIPRING): 2.5 PICOFARADS MAXIMUM AT 1.0 KILOCYCLE PER MIL-STD-202C, METHOD 305.

(4) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VOLTS RMS BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

(5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VDC BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF THIS SCD.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL & FINISH REQUIREMENTS.

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) CONTACT CURRENT RATING (CONTINUOUS): 10 AMPERES RMS MAXIMUM.

(2) CONTACT CURRENT RATING (SWITCHING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CPS, RESISTIVE LOAD.

B. OPERATING LIFE: 10,000 CYCLES MINIMUM.

C. CONSTRUCTION:

(1) WIPER BLADES: MULTILEAF TYPE.

(2) CONTACT AREAS: TREATED WITH A HIGH MOLE ESTER LUBRICANT.

(3) TERMINALS: SILVER ALLOY (90% Ag - 10% Cu), GOLD PLATED. SHALL ACCOMODATE 2 NO. 20 AWG STRANDED CONDUCTORS.

(4) TERMINAL BOARDS: PAPER BASE EPOXY RESIN PER MIL-P-22324, TYPE PEE.

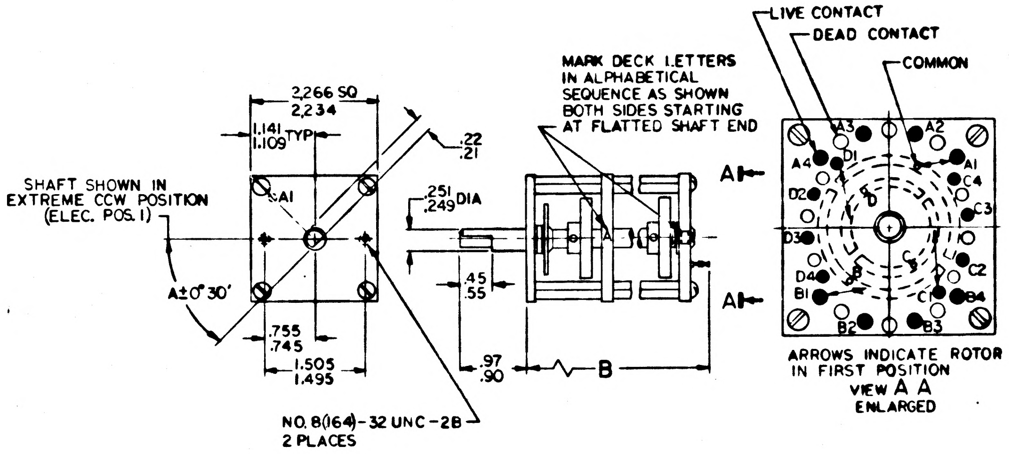
(5) MOUNTING PLATE: ALUMINUM ALLOY PER QQ-A-250/4 ANODIZE PER MIL-A-8625, TYPE I.

(6) PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MD 1002215.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

DASH NO.	DIM. A	TOTAL ROTATION	NUMBER POSITIONS	NUMBER DECKS	DIM. B	SWITCHING TORQUE
-000	45°	90°0′	4	2	2.53 2.47	20 TO 150 OUNCE INCHES
-001	30°	60°0′	3	2	2.53 2.47	20 TO 150 OUNCE INCHES
-002	30°	60°0′	3	1	1.47 1.41	20 TO 150 OUNCE INCHES
-003	60°	120°0′	5	1	1.47 1.41	20 TO 150 OUNCE INCHES

THE ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NO. AND A -000 SUFFIX.


2.266 SQ
2.234
1.141
1.109 TYP
.22
.21
SHAFT SHOWN IN EXTREME CCW POSITION (ELEC. POS. 1)
A1
A±0°30′
.755
.745
1.505
1.495
NO. 8(164)-32 UNC-2B 2 PLACES
.251
.249 DIA
.45
.55
.97
.90
B
A
MARK DECK LETTERS IN ALPHABETICAL SEQUENCE AS SHOWN BOTH SIDES STARTING AT FLATTED SHAFT END
A
A
LIVE CONTACT
DEAD CONTACT
COMMON
A3
A2
A4
D1
A1
C4
D2
C3
D
C
D3
C2
D4
B
B1
C1
B4
B2
B3
ARROWS INDICATE ROTOR IN FIRST POSITION
VIEW A A
ENLARGED

Ⓒ REPLACES REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN L Doty DATE 1/22/65
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 6-22-65
MIT APPROVAL C. Spurling 6/18/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
4 POLES/DECK NON-SHORTING, 30° INDEX
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006257
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006257 C

1006257 D

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
C	REPLACES REV B WITH CHANGE PER TDRR 20284		
B	CHANGED PER TDRR 22553 DR. CHK A. APPD H. Maynard		

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-3786A AND THE SPECIFIC REQUIREMENTS HEREIN.

   B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

   C. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), DECK IDENTIFICATION AND TERMINAL IDENTIFICATION ON EACH DECK AS SHOWN.

   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING FOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.5.1 AND 3.5.2 OF ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) DETENT ACTION AND SWITCH TORQUE: UNITS SHALL HAVE A DEFINITE DETENT ACTION (30° INDEX) AND THE SWITCHING TORQUE SHALL BE PER CHART.

      (3) STOPS: MECHANICAL STOPS LIMITING TRAVEL PER CHART.

      (4) MARKING: IN ACCORDANCE WITH PARAGRAPH 1.C.

   B. ELECTRICAL CHARACTERISTICS:

      (1) SWITCH FORM: 4 POLES/DECK, NO. OF DECKS & POSITIONS PER CHART, NON-SHORTING, 30 DEGREE INDEX.

      (2) CONTACT RESISTANCE: 0.005 OHMS MAXIMUM (0.010 MAXIMUM INITIAL RESISTANCE) AT 100 MILLIAMPERES DIRECT CURRENT WHEN A POTENTIAL OF 2 VOLTS IS APPLIED THROUGH A SUIT-DROPPING RESISTOR PER MIL-STD-202C, METHOD 307. 10 ACTUATIONS SHALL BE MADE PRIOR TO MEASUREMENT.

      (3) CAPACITANCE (CONTACT-CONTACT & CONTACT-SLIPRING): 2.5 PICOFARADS MAXIMUM AT 1.0 KILOCYCLE PER MIL-STD-202C, METHOD 305.

      (4) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VOLTS RMS BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

      (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VDC BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF THIS SCD.

      (2) CERTIFICATE OF COMPLIANCE WITH MATERIAL & FINISH REQUIREMENTS.

3. DESIGN:

   A. ELECTRICAL RATINGS:

      (1) CONTACT CURRENT RATING (CONTINUOUS): 10 AMPERES RMS MAXIMUM.

      (2) CONTACT CURRENT RATING (SWITCHING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CPS, RESISTIVE LOAD.

   B. OPERATING LIFE: 10,000 CYCLES MINIMUM.

   C. CONSTRUCTION:

      (1) WIPER BLADES: MULTILEAF TYPE.

      (2) CONTACT AREAS: TREATED WITH A HIGH MOLE ESTER LUBRICANT.

      (3) TERMINALS: SILVER ALLOY (90% Ag - 10% Cu), GOLD PLATED. SHALL ACCOMODATE 2 NO. 20 AWG STRANDED CONDUCTORS.

      (4) TERMINAL BOARDS: PAPER BASE EPOXY RESIN PER MIL-P-22324, TYPE PEE.

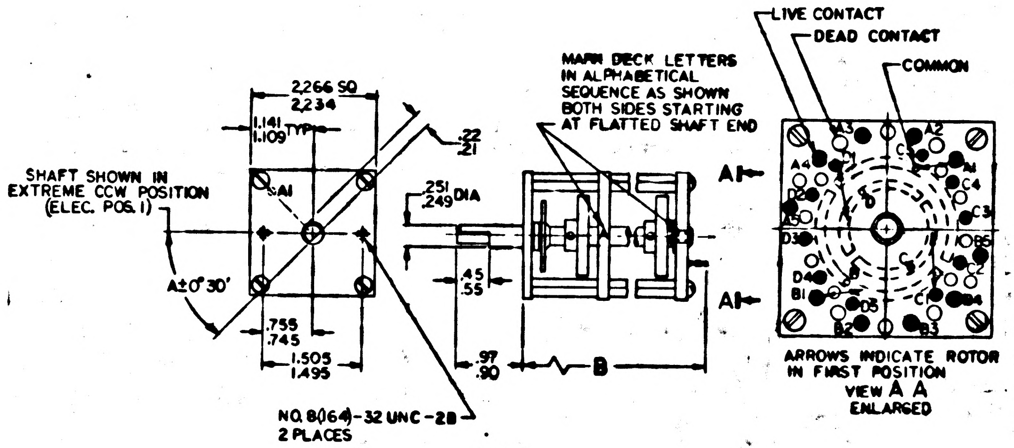
      (5) MOUNTING PLATE: ALUMINUM ALLOY PER QQ-A-250/4 ANODIZE PER MIL-A-8625, TYPE I.

      (6) PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

DASH NO.	DIM. A	TOTAL ROTATION	NUMBER POSITIONS	NUMBER DECKS	DIM. B	SWITCHING TORQUE
-000	45°	90°0′	4	2	2.53 2.47	20 TO 150 OUNCE INCHES
-001	30°	60°0′	3	2	2.53 2.47	20 TO 150 OUNCE INCHES
-002	30°	60°0′	3	1	1.47 1.41	20 TO 150 OUNCE INCHES
-003	60°	120°0′	5	1	1.47 1.41	20 TO 150 OUNCE INCHES

THE ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NO. AND A -000 SUFFIX.



Ⓒ REPLACES REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN J. Doty DATE 5/22/65
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 6-22-65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
4 POLES/DECK NON-SHORTING, 30° INDEX
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006257
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006257 D

— 1006257

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/31/64	wk

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION. THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-3786A AND THE SPECIFIC REQUIREMENTS HEREIN.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.

   D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), DECK IDENTIFICATION AND TERMINAL IDENTIFICATION ON EACH DECK AS SHOWN.

   E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING FOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.5.1 AND 3.5.2 OF ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) DETENT ACTION AND SWITCH TORQUE: UNITS SHALL HAVE A DEFINITE DETENT ACTION (30° INDEX) AND THE SWITCHING TORQUE SHALL BE WITHIN 20 AND 150 OUNCE-INCHES.

      (3) STOPS: MECHANICAL STOPS, LIMITING TRAVEL TO 90°, SHALL WITHSTAND 50 POUND-INCHES OF TORQUE.

      (4) MARKING: IN ACCORDANCE WITH PARAGRAPH 1.D.

   B. ELECTRICAL CHARACTERISTICS:

      (1) SWITCH FORM: 8 POLE (4 POLES/DECK, 2 DECKS), 4 POSITION (30° APART REFERENCE), NON-SHORTING.

      (2) CONTACT RESISTANCE: 0.005 OHMS MAXIMUM (0.010 MAXIMUM INITIAL RESISTANCE) AT 100 MILLIAMPERES DIRECT CURRENT WHEN A POTENTIAL OF 2 VOLTS IS APPLIED THROUGH A SUIT-DROPPING RESISTOR PER MIL-STD-202C, METHOD 307. 10 ACTUATIONS SHALL BE MADE PRIOR TO MEASUREMENT.

      (3) CAPACITANCE (CONTACT-CONTACT & CONTACT-SLIPRING): 2.5 PICOFARADS MAXIMUM AT 1.0 KILOCYCLE PER MIL-STD-202C, METHOD 305.

      (4) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VOLTS RMS BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

      (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VDC BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN MATERIAL AND FINISH REQUIREMENTS.

      (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

3. DESIGN:

   A. ELECTRICAL RATINGS:

      (1) CONTACT CURRENT RATING (CONTINUOUS): 10 AMPERES RMS MAXIMUM.

      (2) CONTACT CURRENT RATING (SWITCHING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CPS, RESISTIVE LOAD.

   B. OPERATING LIFE: 10,000 CYCLES MINIMUM.

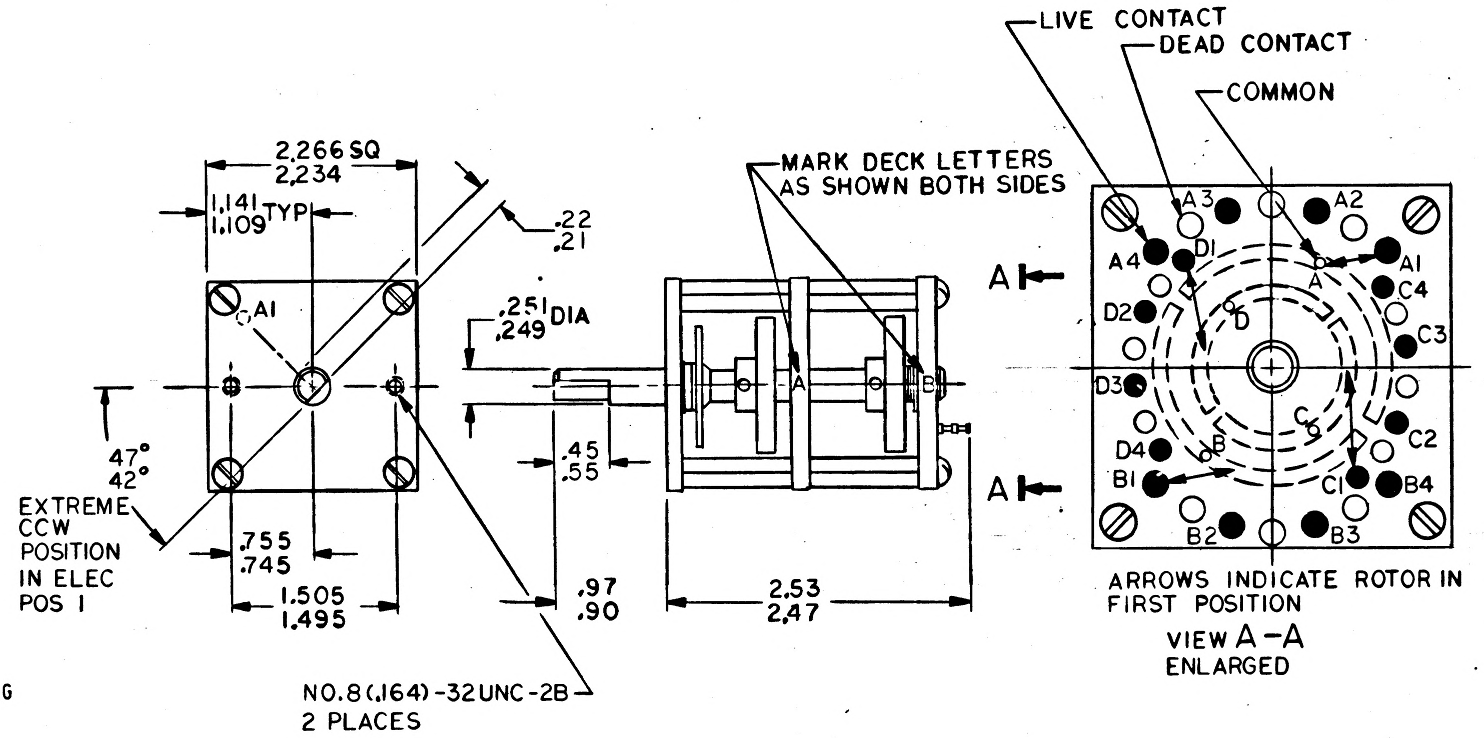
   C. CONSTRUCTION:

      (1) WIPER BLADES: MULTILEAF TYPE

      (2) CONTACT AREAS: TREATED WITH A HIGH MOLE ESTER LUBRICANT.

      (3) TERMINALS: SILVER ALLOY (90% Ag - 10% Cu), GOLD PLATED. SHALL ACCOMODATE 2 NO. 20 AWG STRANDED CONDUCTORS.

      (4) TERMINAL BOARDS: PAPER BASE EPOXY RESIN PER MIL-P-22324, TYPE PEE.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN D. Wood DATE 9 DEC 64
CHECKED R. T. Dronsuk 14 DEC 64
APPROVAL D. O'Bryant 12/23/64
APPROVAL A. Petka 12/23/64
APPROVAL 12/23/64
NASA APPROVAL 12-29-64
MIT APPROVAL 29 Dec 64
MIT APPROVAL C Sperling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
4 POSITION/POLE, 4 POLES/DECK, 2 DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ———
SIZE C
NASA DRAWING NO. 1006257
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006258

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/29/64	WK

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

B. PART MARKING: LIGHT BODIES SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), TERMINAL IDENTITY, SCHEMATIC, AND UNIT ORIENTATION.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES:

(1) DISASSEMBLY FORCE (AXIAL PULL ON LIGHT CAPSULE): 3 POUNDS MAXIMUM.

(2) ASSEMBLY AND DISASSEMBLY: SEE FIGURE I. BY REMOVING THE LIGHT CAPSULE (PULL OUT) LAMPS MAY BE REPLACED. WITH THE CAPSULE DISASSEMBLED THE BEZEL (LENS HOLDER) MAY BE LIFTED UP AND SEPARATED TO ALLOW SERVICING OF COLOR FILTER, DISPLAY SCREEN, AND FRONT LENS.

(3) MOUNTING: LIGHTS MOUNT IN A RECTANGULAR HOLE (AS DELINEATED) BY ADJUSTABLE PAWLS, ACTUATED BY SCREWS, ARRANGED SO THAT DIAGONALLY OPPOSITE CORNERS ARE USED ALLOWING CLOSE SIDE-BY-SIDE MULTIPLE MOUNTING.

(4) LEGEND: .110 (NOMINAL) HIGH CHARACTERS (.017 NOMINAL LINE WIDTH) REVERSE ENGRAVED AND FILLED BLACK ON THE REAR SURFACE OF THE LENS. ALL LINES OF CHARACTERS SHALL BE CENTRALLY LOCATED BOTH WAYS.

(5) TERMINAL STRENGTH: 5 POUNDS MINIMUM NO-SHOCK AXIAL LOAD.

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS.

(2) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VDC BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. CONSTRUCTION AND MATERIAL: A BASIC UNIT HOUSING WITH A REMOVABLE LENS AND LIGHT CAPSULE ASSEMBLY (SEE FIGURE 1). THE LIGHT CAPSULE ACCOMODATES TWO T-1$\frac{3}{4}$ MIDGET FLANGED BASE LAMPS.

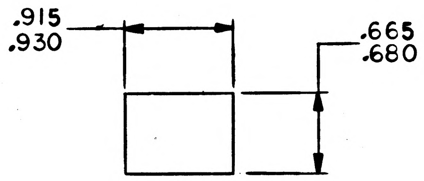
(1) HOUSING: CORROSION-RESISTING STEEL

(2) LIGHT CAPSULE: DIALLYL PHTHALATE

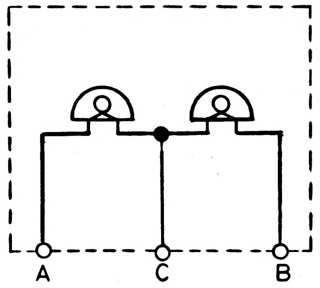
(3) BEZEL OR LENS HOLDER: NYLON (ZYTEL).

(4) FRONT LENS, DISPLAY SCREEN, AND COLOR FILTER: ACRYLIC

(5) TERMINALS: SHALL BE CAPABLE OF ACCEPTING TWO SOLDERED NO. 20 (AWG) LEADS.



RECOMMENDED MOUNTING HOLE



LAMP SCHEMATIC

—	—
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT NONE

FINAL FINISH NONE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.

CONTRACT NO. FNP-12775

DRAWN D. Maney DATE 15 DEC 64
CHECKED 16 DEC 64
APPROVAL D. O'Byrne 12/23/64
APPROVAL 12/23/64
APPROVAL 12/17/64
NASA APPROVAL 12-29-64
MIT APPROVAL 29 Dec 64
MIT APPROVAL C Sperling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT, INDICATOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
——	C	1006258

SCALE NONE WT SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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—	1006258

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/31/64	WK

-001 BASIC UNIT - WITHOUT LIGHT CAPSULE ASSEMBLY

DASH NO. *	COLOR FILTER HORIZ SPLIT **		DISPLAY SCREEN ***	FRONT LENS ENGRAVING		DASH NO. ****
	UPPER	LOWER	HORIZ SPLIT	FIRST ROW	2ND ROW	
-002	AMBER	AMBER		PWR FAIL -S	PWR FAIL -P	-502
-003	WHITE	WHITE		ACC UPL	SP20	-503
-004				CDU FAIL	IMU FAIL	-504
-005				PIPA FAIL	C9	-505
-006				T PROG AL	T TEL AL	-506
-007				T AGC ACT	T PROG CH	-507
-008				T SCALE F	T PAR F	-508
-009				T CNT F	T RUPT AL	-509
-010				T TC TRAP	T KEY REL	-510
-011				T PIPA F	T CDU F	-511
-012				T ENCDR 0	T IMU F	-512
-013				COARSE-A	FINE-A	-513
-014				ENCDR 0	0 ENCDR	-514
-015				ATTITUDE	ROLL REEN	-515
-016				LOCK CDU	CDU FAIL	-516
-017				PIPA FAIL	IMU FAIL	-517
-018				0 OPT CDU	STAR TRKR	-518
-019				OR ALARM	C 9	-519
-020				G/N ATT	X TRANS	-520
-021				G/N ΔV	CM/SM SEP	-521
-022				G/N ENTRY	AUTO .05G	-522
-023				G/N FAIL	FDAI-A	-523
-024				SP21A	SP21B	-524
-025				TELECOM	C33	-525
-026				SP23A	SP23B	-526
-027				SP24A	SP24B	-527
-028				G.M.P.C.	SP25	-528
-029				SP26A	SP26B	-529
-030	WHITE	WHITE	HORIZ SPLIT	SP27A	SP27B	-530

* IDENTITY OF FULL ASSEMBLY (EXCEPT LAMP).

** VERY LIGHT BLUE FOR WHITE ILLUMINATION.

*** DISPLAY SCREEN IS A MILK WHITE TRANSLUCENT PIECE USED TO DIFFUSE LIGHT AND PROVIDE A WHITE BACKGROUND FOR LEGEND WHEN UNLIGHTED.

**** IDENTITY OF FRONT (ENGRAVED) LENS ONLY.

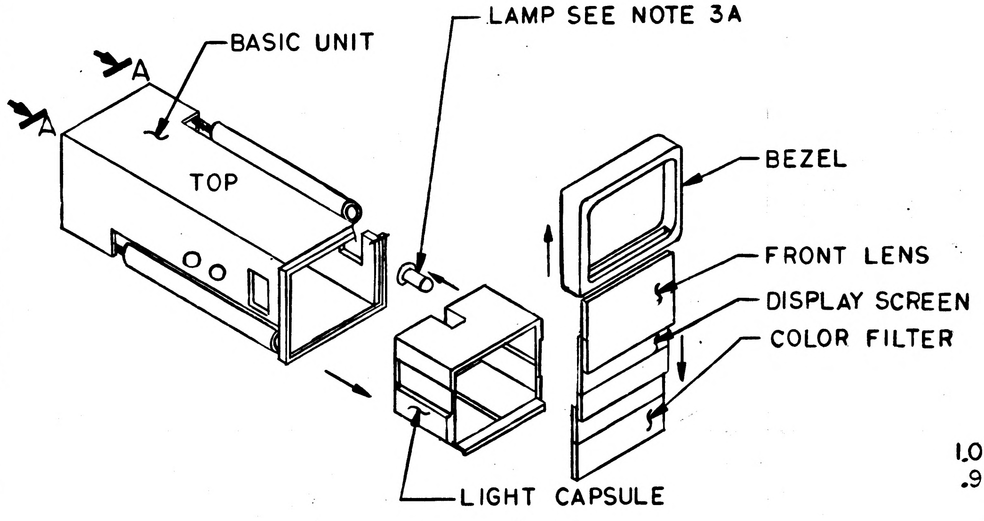
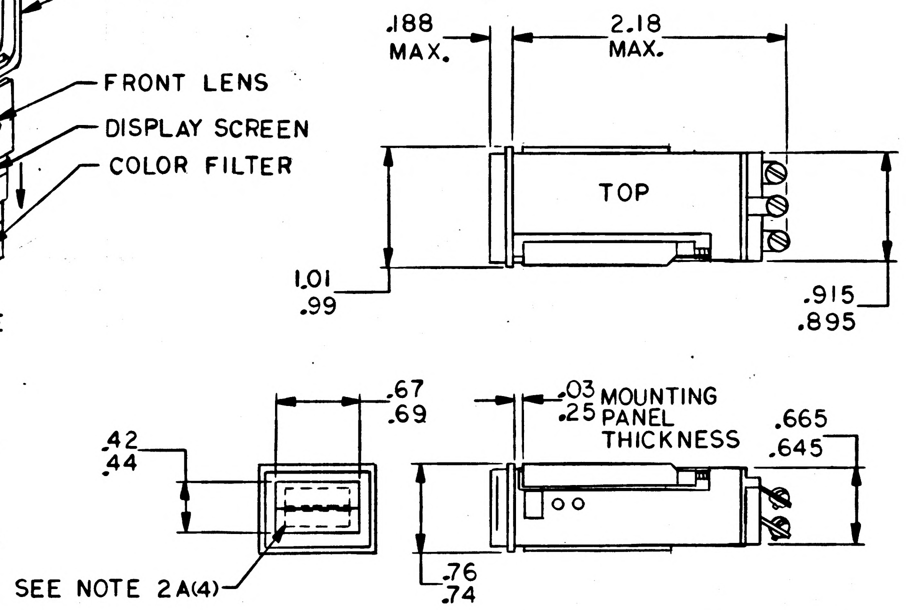
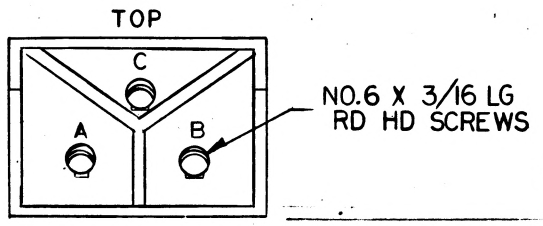


FIG. I





VIEW A-A
ENLARGED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE ~~THIS~~ DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN D. Mongo DMS DATE 15DEC64
CHECKED J Wolfkowicz 16DEC64
APPROVAL D. O'Bryant 12/23/64
APPROVAL A. Pika 12/23/64
APPROVAL 12/23/64
NASA APPROVAL W.J. Rhine 12-29-64
MIT APPROVAL W. Kupfer 29 Dec 64
MIT APPROVAL C Sperling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT, INDICATOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006258
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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— | 1006259

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/29/64	WK

REQUIREMENTS:

1. GENERAL:

A. SWITCHES SHALL CONFORM TO THE REQUIREMENTS OF MIL-S-22885, AND THE REQUIREMENTS HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

C. SWITCHES SHALL BE CAPABLE OF MEETING THE QUALIFICATION PROVISIONS CONTAINED IN ND 1002055.

D. PART MARKING: SWITCH BODIES SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURERS NAME AND/OR SYMBOL, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), TERMINAL IDENTITY, SCHEMATIC, AND UNIT ORIENTATION.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES:

(1) DISASSEMBLY FORCE (AXIAL PULL ON LIGHT CAPSULE): 3 POUNDS MAXIMUM.

(2) ACTUATING FORCE (AXIAL PUSH ON LIGHT CAPSULE): 1.0 - 4.0 POUNDS.

(3) ACTUATOR TRAVEL (NOMINAL): .100 PRETRAVEL, .120 TOTAL.

(4) SWITCH ACTUATION INDICATION: BOTH FEEL AND SOUND AS A DEFINITE CHARACTERISTIC.

(5) ACTUATOR STRENGTH: 25 POUNDS MINIMUM AXIAL FORCE.

(6) OPERATION: THE FOUR SWITCHES (POLES) SHALL BE ON WHEN THE FRONT LENS IS DEPRESSED AND RELEASED AFTER AN INDICATION OF BOTH FEEL AND SOUND. TO TURN SWITCH OFF, ANOTHER ACTUATION IS NECESSARY.

(7) ASSEMBLY AND DISASSEMBLY: SEE FIGURE I. BY REMOVING THE LIGHT CAPSULE (PULL OUT) LAMPS MAY BE REPLACED. WITH THE CAPSULE DISASSEMBLED, THE BEZEL (LENS HOLDER) MAY BE LIFTED UP AND SEPERATED TO ALLOW SERVICING OF COLOR FILTER, DISPLAY SCREEN, AND FRONT LENS.

(8) MOUNTING: SWITCHES MOUNT IN A RECTANGULAR HOLE (AS DELINEATED) BY ADJUSTABLE PAWLS, ACTUATED BY SCREWS, ARRANGED SO THAT DIAGONALLY OPPOSITE CORNERS ARE USED ALLOWING CLOSE SIDE-BY-SIDE MULTIPLE MOUNTING.

(9) LEGEND: .110 (NOMINAL) HIGH CHARACTERS (.017 NOMINAL LINE WIDTH) REVERSE ENGRAVED AND FILLED BLACK ON THE REAR SURFACE OF THE CLEAR PUSH BUTTON LENS. ALL LINES OF CHARACTERS SHALL BE CENTRALLY LOCATED BOTH WAYS.

(10) TERMINAL STRENGTH: 5 POUNDS MINIMUM NO-SHOCK AXIAL LOAD.

B. ELECTRICAL CHARACTERISTICS:

(1) SWITCH CONTACT ARRANGEMENT: 4 PDT ALTERNATING ON-OFF.

(2) CONTACT RESISTANCE: 100 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES DC WHEN 2 VOLTS ARE APPLIED THRU A SUITABLE RESISTOR. THE SWITCHES MAY BE OPERATED 5 TIMES PRIOR TO MEASURMENT.

(3) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).

(4) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VDC BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

3. DESIGN:

A. OPERATING LIFE: 100,000 CYCLES MINIMUM OF MECHANICAL OPERATION (25,000 CYCLES UNDER A RESISTIVE LOAD). A CYCLE SHALL BE TWO PUSHES OF ACTUATOR i.e. THE COUNTER WOULD BE SET UP ON ONE SWITCH TERMINAL.

B. CONSTRUCTION AND MATERIAL: A BASIC UNIT HOUSING WITH SWITCHES AND A REMOVABLE LENS AND LIGHT CAPSULE ASSEMBLY (SEE FIGURE 1). THE LIGHT CAPSULE ACCOMODATES TWO T-1$\frac{3}{4}$ MIDGET FLANGED BASE LAMPS.

(1) HOUSING: CORROSION-RESISTING STEEL

(2) LIGHT CAPSULE AND SWITCH DIELECTRIC: DIALLYL PHTHALATE

(3) BEZEL OR LENS HOLDER: NYLON (ZYTEL)

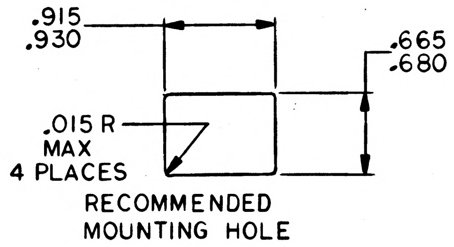
(4) FRONT LENS, DISPLAY SCREEN, AND COLOR FILTER: ACRYLIC

C. ELECTRICAL RATINGS (SWITCH CONTACTS)

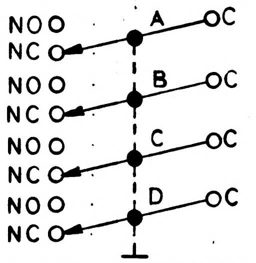
(1) 4.0 AMPERES AT 28 VDC RESISTIVE LOAD

(2) 2.5 AMPERES AT 28 VDC INDUCTIVE LOAD

(3) 1.0 AMPERES AT 28 VDC LAMP LOAD

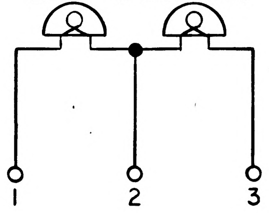


RECOMMENDED MOUNTING HOLE



SWITCH SCHEMATIC

LAMP SCHEMATIC



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT: NONE
FINAL FINISH: NONE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN D. Money DATE 14 DEC 64
CHECKED [illegible] 16 DEC 64
APPROVAL D. O'Bryant 12/23/64
APPROVAL A. J. Peka 12/23/64
APPROVAL [illegible] 12/27/64
NASA APPROVAL W. J. Rhine 12-29-64
MIT APPROVAL W. Kupfer 29 Dec 64
MIT APPROVAL C. Sperling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTING
PUSHBUTTON 4PDT ALTERNATING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006259
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006259 — B

—	1006259

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/29/64	WK

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-001 BASIC UNIT, 4PDT SWITCH WITHOUT LIGHT CAPSULE ASSEMBLY

DASH NO. *	COLOR FILTER **	DISPLAY SCREEN ***	FRONT LENS ENGRAVING			DASH NO. ****
			FIRST ROW	SECOND ROW	THIRD ROW	
-002	FULL	FULL	IN0- 7	INHIBIT	UPSYNC	-502
-003	WHITE		IN0-11	G/N ATT.	CONT. MODE	-503
-004			IN0-12	G/N ΔV	MODE	-504
-005			IN0-13	G/N ENTRY	MODE	-505
-006			IN0-15	MARK		-506
-007			IN2- 5	LIFT OFF		-507
-008			IN2- 6	GUIDANCE	RELEASE	-508
-009			IN2- 7	SATURN	ULLAGE	-509
-010			IN2- 8	S IV B	SEPARATE	-510
-011			IN2- 9	SM/CM	SEPARATE	-511
-012			IN2-10	CDU FAIL		-512
-013			IN2-11	PIPA FAIL		-513
-014			IN2-12	IMU FAIL		-514
-015			IN2-13	SCS ΔV	MODE	-515
-016			IN2-14	G/N MON.	MODE	-516
-017			IN3- 1	K 1		-517
-018			IN3- 2	K 2		-518
-019			IN3- 3	K 3		-519
-020			IN3- 4	K 4		-520
-021			IN3- 5	K 12		-521
-022			IN3- 6	TRANSFER	SWITCH	-522
-023			IN3- 7	K 5		-523
-024			IN3-10	OPT. MODE	SW 3	-524
-025			IN3-11	STAR PRES.		-525
-026			IN3-12	ZERO OPT		-526
-027			IN3-13	SEXTANT	ON	-527
-028			IN3-14	OPT. MODE	SW 2	-528
-029			DOWNLINK	ENABLE SW		-529
-030			LOAD	CHAN A	200 OHMS	-530
-031			SCOPE	PROBES	1:1	-531
-032			SP 1			-532
-033			SP 2			-533
-034			SP 3			-534
-035			SP 4			-535
-036			SP 5			-536
-037			SP 6			-537
-038			SP 7			-538
-039			SP 8			-539
-040			SP 9			-540
-041			SP 10			-541
-042			SP 11			-542
-043			SP 12			-543
-044			SP 13			-544
-045			SP 14			-545
-046			SP 15			-546
-047			SP 16			-547
-048			SP 17			-548
-049	FULL		+ AND -	AGC INPUT	COUNTERS	-549
-050	WHITE	FULL	SP 19			-550

* IDENTITY OF ASSEMBLY (EXCEPT LAMP).

** VERY LIGHT BLUE FOR WHITE ILLUMINATION.

*** DISPLAY SCREEN IS A MILK WHITE TRANSLUCENT PIECE USED TO DIFFUSE LIGHT AND PROVIDE A WHITE BACKGROUND FOR LEGEND WHEN UNLIGHTED.

**** IDENTITY OF FRONT (ENGRAVED) LENS ONLY.

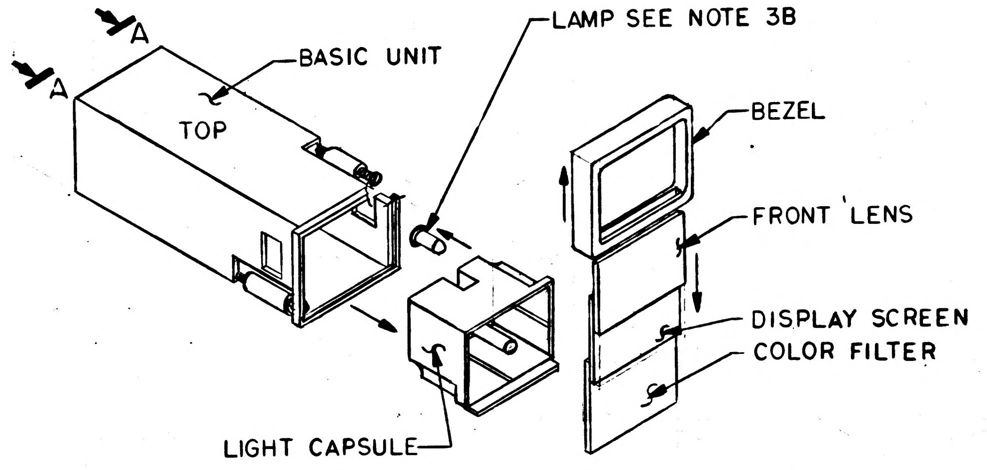
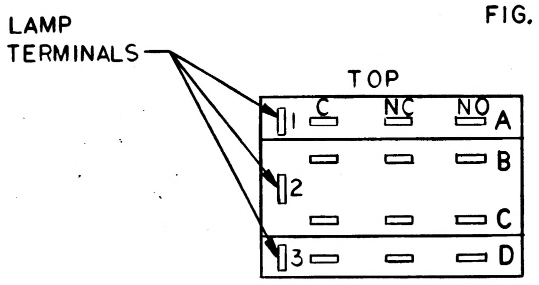
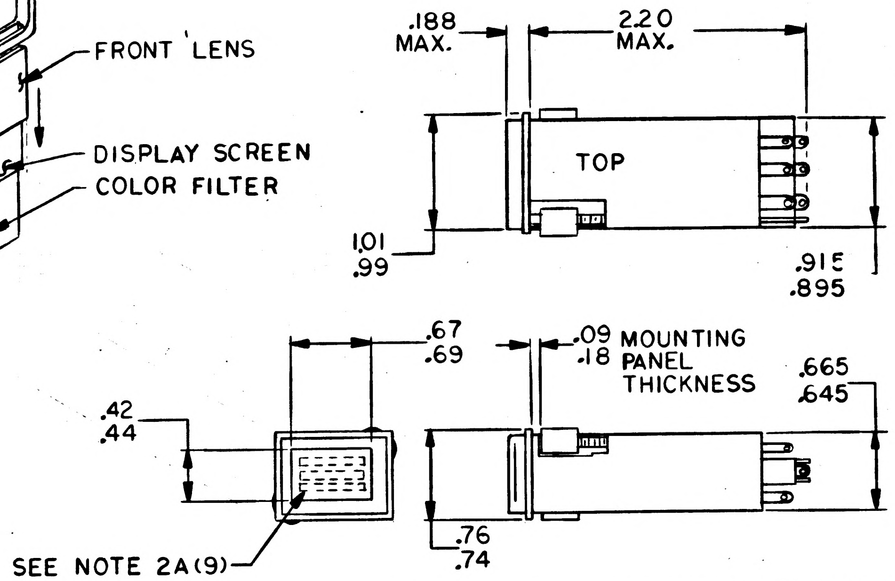


FIG. 1



VIEW A-A ENLARGED



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN D. Money DATE 15DEC 64
CHECKED J. Wolfberg 16 DEC 64
APPROVAL D. Oleryonk 12/23/64
APPROVAL R. Peka 12/23/64
APPROVAL W. J. Bernier 12/23/64
NASA APPROVAL W. J. Rhine 12-28-64
MIT APPROVAL W. Kupfer 28 Dec 64
MIT APPROVAL C. Sperling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTING PUSHBUTTON, 4PDT ALTERNATING SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO 1006259
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006263 A

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	[illegible]	WK
A	REVISED PER TDRR 16755 DR J. P. Leonard CHK [illegible] APPD A. Maynard	3/4/65	REB

REQUIREMENTS:

1. GENERAL:

A. RESISTORS SHALL MEET THE REQUIREMENTS OF MIL-R-10509B, TYPE RN25, CHARACTERISTIC B WITH THE EXCEPTIONS LISTED BELOW.

B. SUPPLIER SHALL CONFORM TO MIL-Q-9858. ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

C. RESISTORS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.

D. PART MARKING: RESISTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), RESISTANCE VALUE AND TOLERANCE, AND WATTAGE RATING.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) WORKMANSHIP AND CONSTRUCTION: RESISTORS SHALL BE A FILM TYPE RESISTANCE ELEMENT PROTECTED FROM HUMIDITY BY A COATING OF MOISTURE-RESISTANT INSULATING MATERIAL. THEY SHALL BE UNIFORM IN QUALITY AND FREE FROM ANY DEFECTS WHICH WOULD AFFECT LIFE, SERVICEABILITY OR APPEARANCE.

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC WITHSTANDING VOLTAGE: 900 VRMS, 60 CPS

(2) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM.

(3) SHORT TIME OVERLOAD: 1000 VDC FOR 5 SECONDS WITH NO FLASHOVER OR DAMAGE AND NO RESISTANCE CHANGE IN EXCESS OF 0.5 PERCENT.

(4) INITIAL RESISTANCE VALUE AND TOLERANCE: 9.0 MEGOHMS ± 1%.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF THIS DRAWING. TYPE [illegible].

~~(2) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF ND 1015404, CLASS 3.~~

(3) CERTIFICATE OF COMPLIANCE WITH THE LEAD MATERIAL REQUIREMENTS.

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) POWER DISSIPATION: 1 WATT MAXIMUM AT 40°C DERATED TO ZERO AT 125°C.

(2) RESISTANCE-TEMPERATURE COEFFICIENT: ± 500 PPM/°C.

(2) RESISTANCE-TEMPERATURE COEFFICIENT: ± 600 PPM/°C.

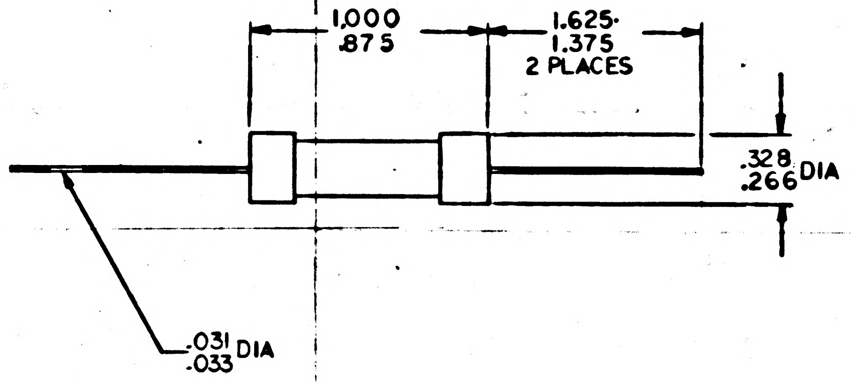
+40°C DERATED TO ZERO AT +125°C.

B. OPERATING LIFE: 1000 HOURS MINIMUM AT +40°C AND FULL POWER DISSIPATION WITH A RESISTANCE CHANGE OF LESS THAN 1.0%.

B. OPERATING LIFE: 1000 HOURS MINIMUM AT +40°C AND FULL POWER DISSIPATION WITH A RESISTANCE CHANGE OF LESS THAN 1.0%.

C. WORKMANSHIP AND CONSTRUCTION: RESISTORS SHALL BE A FILM TYPE RESISTANCE ELEMENT PROTECTED FROM HUMIDITY BY A COATING OF MOISTURE-RESISTANT INSULATING MATERIAL. THEY SHALL BE UNIFORM IN QUALITY AND FREE FROM ANY DEFECTS WHICH WOULD AFFECT LIFE, SERVICEABILITY OR APPEARANCE.

D. LEAD MATERIAL: TINNED COPPER.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL NONE
HEAT TREATMENT NONE
FINAL FINISH NONE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775

DRAWN D. [illegible] DATE 7 DEC 64
CHECKED R. T. [illegible]
APPROVAL D. P. [illegible] 12/23/64
APPROVAL A. [illegible] 12/23/64
APPROVAL [illegible] 12/23/64
NASA APPROVAL W. J. [illegible] 12-29-64
MIT APPROVAL W. [illegible]
MIT APPROVAL C. Sparling 1/69

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, DEPOSITED
CARBON 1% TOL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006263
SCALE NONE	WT	SHEET 1 OF 1

1006263 A

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

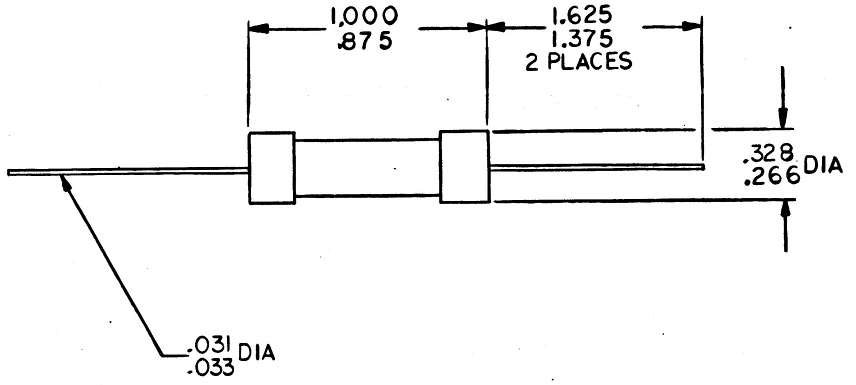
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 15221	12/29/64	WK

—	1006263

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. RESISTORS SHALL MEET THE REQUIREMENTS OF MIL-R-10509B, TYPE RN25, CHARACTERISTIC B WITH THE EXCEPTIONS LISTED BELOW.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. RESISTORS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - D. PART MARKING: RESISTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), RESISTANCE VALUE AND TOLERANCE, AND WATTAGE RATING.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) DIELECTRIC WITHSTANDING VOLTAGE: 900 VRMS, 60 CPS
     - (2) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM.
     - (3) SHORT TIME OVERLOAD: 1000 VDC FOR 5 SECONDS WITH NO FLASHOVER OR DAMAGE AND NO RESISTANCE CHANGE IN EXCESS OF 0.5 PERCENT.
     - (4) INITIAL RESISTANCE VALUE AND TOLERANCE: 9.0 MEGOHMS ± 1%.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF MIL-R-10509B, TYPE RN25.
     - (2) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF ND 1015404, CLASS 3.
     - (3) CERTIFICATE OF COMPLIANCE WITH THE LEAD MATERIAL REQUIREMENTS.
3. DESIGN:
   - A. ELECTRICAL RATINGS:
     - (1) POWER DISSIPATION: 1 WATT MAXIMUM AT 40°C DERATED TO ZERO AT 125°C.
     - (2) RESISTANCE-TEMPERATURE COEFFICIENT: ± 500 PPM/°C.
   - B. OPERATING LIFE: 1000 HOURS MINIMUM AT +40°C AND FULL POWER DISSIPATION WITH A RESISTANCE CHANGE OF LESS THAN 1.0%.
   - C. WORKMANSHIP AND CONSTRUCTION: RESISTORS SHALL BE A FILM TYPE RESISTANCE ELEMENT PROTECTED FROM HUMIDITY BY A COATING OF MOISTURE-RESISTANT INSULATING MATERIAL. THEY SHALL BE UNIFORM IN QUALITY AND FREE FROM ANY DEFECTS WHICH WOULD AFFECT LIFE, SERVICEABILITY OR APPEARANCE.
   - D. LEAD MATERIAL: TINNED COPPER.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL NONE
HEAT TREATMENT NONE
FINAL FINISH NONE

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN D. DATE 7DEC64
CHECKED R. T. 9DEC64
APPROVAL D. O'B 12/23/64
APPROVAL 12/23/64
APPROVAL 12/23/64
NASA APPROVAL 12-29-64
MIT APPROVAL
MIT APPROVAL C. Sperling 12/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, DEPOSITED
CARBON 1% TOL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006263
SCALE NONE	WT	SHEET 1 OF 1

1006266	A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07621	4/14/64	
A	REVISED PER TDRR 11072	7/28/64	wil

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THIS COMPOUND SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-23586 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

   C. SUPPLIER SHALL MEET THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   D. MARKING: STORAGE AND SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT OR BATCH CODE, DATE OF MANUFACTURE AND/OR "USE BEFORE" DATE, NET CONTENTS, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

   A. COLOR: WHITE

   B. SPECIFIC GRAVITY AT 25°±2C 0.8-0.9 PER ASTM-D792

   C. VISCOSITY AT 25°±2C 100,000 CENTIPOISE MAX USING A BROOKFIELD VISCOMETER NO.7 SPINDLE @ 10 R.P.M

   E. CERTIFICATION OF BATCH PROPERTIES: CURED PHYSICAL AND ELECTRICAL PROPERTIES, AS SPECIFIED BELOW, OF THE BATCH BEING SHIPPED SHALL BE CERTIFIED WITH EACH SHIPMENT. CURE SHALL BE WITH NASA PART 1006267 AT ROOM TEMPERATURE.

3. DESIGN:

   A. STORAGE LIFE: UNCURED COMPOUND SHALL BE CAPABLE OF 3 MONTHS MINIMUM STORAGE BELOW 80° F IN UNOPENED CONTAINERS

   B. CURED PROPERTIES: 200 PARTS BY WEIGHT OF THIS COMPOUND MIXED WITH 1 PART BY WEIGHT OF CURING AGENT PER NASA DRAWING 1006267 AND CURED OVERNIGHT AT ROOM TEMPERATURE (THICK SECTIONS WILL REQUIRE MORE CURE TIME) SHALL PRODUCE A MATERIAL HAVING THE FOLLOWING PROPERTIES:

      (1) COLOR: WHITE
      (2) SPECIFIC GRAVITY: 0.8-0.9 ASTM D-792
      (3) HARDNESS: 45-70 DUROMETER, SHORE A PER ASTM D676
      (4) ULTIMATE TENSILE STRENGTH: 760 PSI MINIMUM PER ASTM D412
      (5) ELONGATION: 135% MINIMUM PER ASTM D412
      (6) WATER ABSORPTION (AFTER 24 HOURS): 0.1% MAXIMUM BY WEIGHT ASTM D570 PROCEDURE A
      (7) DIELECTRIC WITHSTANDING VOLTAGE: 500 VOLTS/MIL PER ASTM D149
      (8) VOLUME RESISTIVITY: 10^{14} OHM-CENTIMETERS MINIMUM PER ASTM D257
      (9) DIELECTRIC CONSTANT (FROM 10^2 TO 10^{10} CPS): 2.9 MAX.@ 1 MC PER ASTM D150
      (10) DISSIPATION FACTOR: 0.03 MAX.@ 1 MC STM D150

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orifice DATE 27 MAR 64
CHECKED P. Winfield 30 MAR 64
APPROVAL
APPROVAL Eldon C Hall 9 April 64
NASA APPROVAL 4/14/64
MIT APPROVAL 4/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE RUBBER COMPOUND, RM TEMP VULCANIZING, LOW DENSITY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006266
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

— 1006266

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07621	4/14/64	JW

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS COMPOUND SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-23586 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL MEET THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: STORAGE AND SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT OR BATCH CODE, DATE OF MANUFACTURE AND/OR "USE BEFORE" DATE, NET CONTENTS, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

A. COLOR: WHITE

B. SPECIFIC GRAVITY AT 25°C: 0.8-0.9 PER ASTM-D792

C. VISCOSITY AT 25°C: 100,000 CENTIPOISE MAX PER ASTM-D1824

D. SOLIDS CONTENT: 100%

E. CERTIFICATION OF BATCH PROPERTIES: CURED PHYSICAL AND ELECTRICAL PROPERTIES, AS SPECIFIED BELOW, OF THE BATCH BEING SHIPPED SHALL BE CERTIFIED WITH EACH SHIPMENT. CURE SHALL BE WITH NASA PART 1006267 AT ROOM TEMPERATURE.

3. DESIGN:

A. STORAGE LIFE: UNCURED COMPOUND SHALL BE CAPABLE OF 3 MONTHS MINIMUM STORAGE IN A COOL PLACE IN CLOSED CONTAINERS.

B. CURED PROPERTIES: 200 PARTS BY WEIGHT OF THIS COMPOUND MIXED WITH 1 PART BY WEIGHT OF CURING AGENT PER NASA DRAWING 1006267 AND CURED OVERNIGHT AT ROOM TEMPERATURE (THICK SECTIONS WILL REQUIRE MORE CURE TIME) SHALL PRODUCE A MATERIAL HAVING THE FOLLOWING PROPERTIES:

(1) COLOR: WHITE

(2) SPECIFIC GRAVITY: 0.65

(3) HARDNESS: 55 DUROMETER, SHORE A PER ASTM D676

(4) ULTIMATE TENSILE STRENGTH: 760 PSI MINIMUM PER ASTM D412

(5) ELONGATION: 135% MINIMUM PER ASTM D412

(6) WATER ABSORPTION (AFTER 25 HOURS): 0.1% MAXIMUM BY WEIGHT

(7) DIELECTRIC WITHSTANDING VOLTAGE: 500 VOLTS/MIL PER ASTM D149

(8) INSULATION RESISTANCE: 10^{14} OHM-CENTIMETERS MINIMUM PER ASTM D257

(9) DIELECTRIC CONSTANT (FROM 10^2 TO 10^{10} CPS): 2.0 TYPICAL PER ASTM D150

(10) DISSIPATION FACTOR: 0.01 TYPICAL PER ASTM D150

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orifice DATE 27MAR64
CHECKED P. Winfield 30 MAR 64
APPROVAL
APPROVAL Elden C Hall 9 April 64
NASA APPROVAL K Mikesh 4/14/64
MIT APPROVAL L Hazel 4/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE RUBBER COMPOUND,
RM TEMP VULCANIZING, LOW DENSITY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006266
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006267

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07621	4/14/64	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: STORAGE AND SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART OR TYPE DESIGNATION, LOT OR BATCH CODE, DATE OF MANUFACTURE AND/OR "USE BEFORE" DATE, NET CONTENTS, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

   A. SPECIFIC GRAVITY AT 25°C: 1.03-1.07 PER ASTM-D792

   B. VISCOSITY AT 25°C: 25-60 CPS PER ASTM-D1824

   C. CERTIFICATION: THE ABILITY TO CURE ROOM TEMPERATURE VULCANIZING SILICONE RUBBER COMPOUND, PER NASA DRAWING 1006266 PROPERTIES, SHALL BE CERTIFIED WITH EACH SHIPMENT.

   D. COLOR: AMBER

   E. FREEZING POINT: 15°F

3. DESIGN:

   A. STORAGE LIFE: ONE YEAR MINIMUM WHEN STORED IN A COOL PLACE IN CLOSED CONTAINERS.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Ofice DATE 27 Mar 64
CHECKED P. Winfield 30 Mar 64
APPROVAL
APPROVAL Eldon C Hall 9 April 64
NASA APPROVAL 4/14/64
MIT APPROVAL 4/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CURING AGENT—
SILICONE RUBBER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006267
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006268 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07334	3/31/64	JW
A	REVISED PER TDRR 13408	10/20/64	

Ⓜ

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002052 WHEN TESTED IN CONJUNCTION WITH PIN CONTACT 1010738-1. SEE NOTES 2.D AND 3.B.

C. MARKING: PARTS AND INTERNAL AND EXTERNAL PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, DATE OF MANUFACTURE OR DATE CODE, AND THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). THE MANUFACTURER'S PART NUMBER MAY APPEAR ON PACKAGES.

D. QUALITY ASSURANCE: PER ND 1015404 CLASS 2.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:

A. CERTIFICATION: CONFORMANCE WITH MATERIAL AND FINISH REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.

B. DIMENSIONS: AS DELINEATED

C. MARKING: AS REQUIRED IN NOTE 1.C ABOVE.

D. ELECTRICAL CHARACTERISTICS (WHEN 1010738-1 CONTACTS ARE ASSEMBLED)

(1) INSULATION RESISTANCE (TEST PER MIL-STD-202, METHOD 302, CONDITION C) 2000 MEGOHMS MINIMUM AT 150°F BETWEEN THE MOUNTING HARDWARE AND ANY CONTACT OR BETWEEN ANY TWO ADJACENT CONTACTS.

(2) DIELECTRIC WITHSTANDING VOLTAGE (TEST PER MIL-STD-202, METHOD 301) SEA LEVEL - 1500 VRMS
90,000 TO 130,000 FEET - 250 VRMS

THERE SHALL BE NO BREAKDOWN OR FLASHOVER BETWEEN THE MOUNTING HARDWARE AND ANY CONTACT OR BETWEEN ANY TWO ADJACENT CONTACTS.

E. PIN IDENTIFICATION SHALL BE MARKED BY RAISED MOLDED CHARACTERS.

3. DESIGN REQUIREMENTS:

A. VOLTAGE DESIGN RATINGS:

ALTITUDE	VOLTS DC	VOLTS RMS (SINUSOIDAL)
SEA LEVEL	490	350
10,000 FT.	390	280
60,000 FT.	140	100

B. CONTACT RETENTION FORCE: 15 POUNDS MINIMUM AXIAL LOAD WITHOUT DAMAGE TO PROPERLY INSTALLED CONTACTS APPLIED IN EITHER DIRECTION. APPLY LOAD AT ONE POUND PER SECOND RATE.

C. MATING CONNECTOR: 1006269

D. CONSTRUCTION:

(1) MATERIAL: BODY, SPACER: DIALLYL PHTHALATE PER MIL-M-IY, TYPE STG-F (TAN COLOR)

POLARIZING BOSS: 7075-T6 ALUMINUM ALLOY PER QQ-A-277.

METAL INSERT: CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303 OR 303SE, CONDITION A OR B.

RETAINING RING: MS 16632-28

(2) FINISH:

POLARIZING BOSS: GREY ANODIZE PER MIL-A-8625, CLASS 1.

METAL INSERT: PASSIVATE PER MIL-F-14072, E300

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Oilie DATE 12MAR64
CHECKED J.C. Joubert 17 Mar 64
APPROVAL
APPROVAL Eldon C Hall 31 Mar 64
NASA APPROVAL W J Rhine 3-31-64
MIT APPROVAL
MIT APPROVAL D Hazel 3/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL
(244 PIN BODY)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006268
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

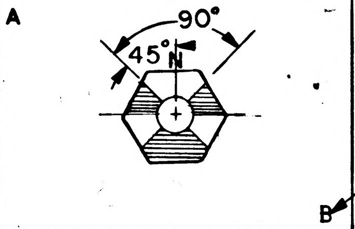
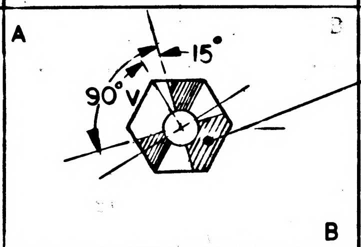
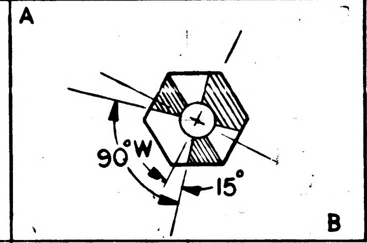
1006268 A

Ⓜ

REVISIONS

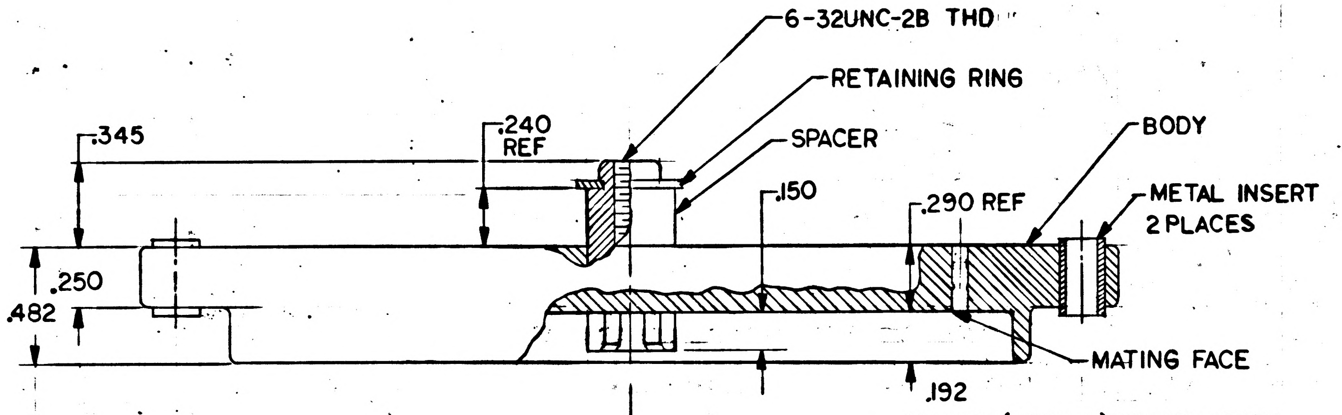
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07334	3/31/64	
A	REVISED PER TDRR 13408	10/2/64	

VIEWED FROM MATING FACE

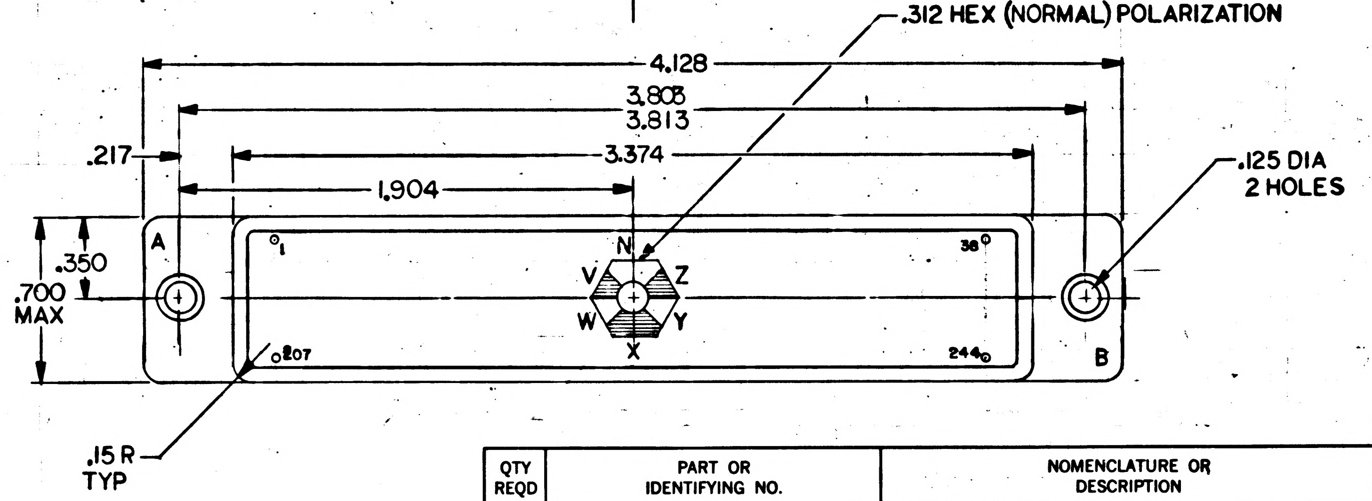
NASA PART NUMBER	POLARIZING CHART
1006268-1	
1006268-2	
1006268-3	

THIS LETTER FOR END IDENT. ONLY TYP

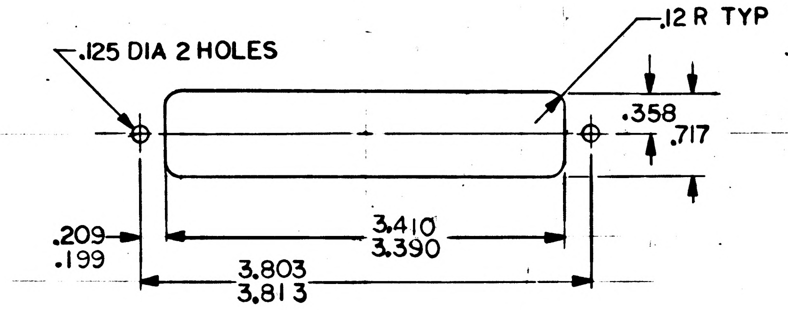
HIGH POINTS OF POLARIZING BOSS SHADED



6-32UNC-2B THD
RETAINING RING
SPACER
BODY
METAL INSERT 2 PLACES
.345
.240 REF
.150
.290 REF
.250
.482
MATING FACE
.192



.312 HEX (NORMAL) POLARIZATION
4.128
3.808
3.813
.217
3.374
1.904
.125 DIA 2 HOLES
.350
.700 MAX
A
N
V
Z
W
Y
X
1
38
207
244
B
.15 R TYP



.125 DIA 2 HOLES
.12 R TYP
.358
.717
.209
.199
3.410
3.390
3.803
3.813

RECOMMENDED MOUNTING HOLE CUTOUT

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ±.03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DMS
DRAWN S.T. Oiiice DATE 12 MAR 64
CHECKED J.C. Joubert 17 MAR 64
APPROVAL
APPROVAL Eldon C Hall 31 Mar 64
NASA APPROVAL W. J. Rhine 3-31-64
MIT APPROVAL
MIT APPROVAL [illegible] 3/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL
(244 PIN BODY)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006268
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006268

Ⓜ

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07334	3/31/64	STW JW

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002052 WHEN TESTED IN CONJUNCTION WITH PIN CONTACT 1010738-1. SEE NOTES 2.D AND 3.B.
   - C. MARKING: PARTS AND INTERNAL AND EXTERNAL PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, DATE OF MANUFACTURE OR DATE CODE, AND THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). THE MANUFACTURER'S PART NUMBER MAY APPEAR ON PACKAGES.
   - D. QUALITY ASSURANCE: PER ND 1015404 CLASS 2.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. CERTIFICATION: CONFORMANCE WITH MATERIAL AND FINISH REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. DIMENSIONS: AS DELINEATED
   - C. MARKING: AS REQUIRED IN NOTE 1.C ABOVE.
   - D. ELECTRICAL CHARACTERISTICS (WHEN 1010738-1 CONTACTS ARE ASSEMBLED)
     - (1) INSULATION RESISTANCE (TEST PER MIL-STD-202, METHOD 302, CONDITION C) 2000 MEGOHMS MINIMUM AT 150°F BETWEEN THE MOUNTING HARDWARE AND ANY CONTACT OR BETWEEN ANY TWO ADJACENT CONTACTS.
     - (2) DIELECTRIC WITHSTANDING VOLTAGE (TEST PER MIL-STD-202, METHOD 301)
       SEA LEVEL - 1500 VRMS
       90,000 TO 130,000 FEET - 250 VRMS

       THERE SHALL BE NO BREAKDOWN OR FLASHOVER BETWEEN THE MOUNTING HARDWARE AND ANY CONTACT OR BETWEEN ANY TWO ADJACENT CONTACTS.
   - E. PIN IDENTIFICATION SHALL BE MARKED BY RAISED MOLDED CHARACTERS.

3. DESIGN REQUIREMENTS:
   - A. VOLTAGE DESIGN RATINGS:

ALTITUDE	VOLTS DC	VOLTS RMS (SINUSOIDAL)
SEA LEVEL	490	350
10,000 FT.	390	280
60,000 FT.	140	100

   - B. CONTACT RETENTION FORCE: 15 POUNDS MINIMUM AXIAL LOAD WITHOUT DAMAGE TO PROPERLY INSTALLED CONTACTS APPLIED IN EITHER DIRECTION. APPLY LOAD AT ONE POUND PER SECOND RATE.
   - C. MATING CONNECTOR: 1006269
   - D. CONSTRUCTION:
     - (1) MATERIAL:

       BODY: UNPIGMENTED DIALLYL PHTHALATE PER MIL-P-19833, TYPE SDI-5 OR GDI-30F AS APPLICABLE.

       POLARIZING BOSS: 7075-T6 ALUMINUM ALLOY PER QQ-A-277.

       METAL INSERT: CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303 OR 303SE, CONDITION A OR B.

       SPACER: BRASS PER QQ-B-626, COMPOSITION 11

       RETAINING RING: MS 16632-28
     - (2) FINISH:

       POLARIZING BOSS: GREY ANODIZE PER MIL-A-8625, CLASS 1.

       METAL INSERT: PASSIVATE PER MIL-F-14072, E300

       SPACER: NICKEL PLATE PER QQ-N-290

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN DMS: S.T. Ordie DATE 12 MAR 64
CHECKED J.C. Joubert 17 Mar 64
APPROVAL
APPROVAL Eldon C Hall 31 Mar 64
NASA APPROVAL W J Rhine 3-31-64
MIT APPROVAL
MIT APPROVAL D Hazel 3/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL
(244 PIN BODY)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006268
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006268

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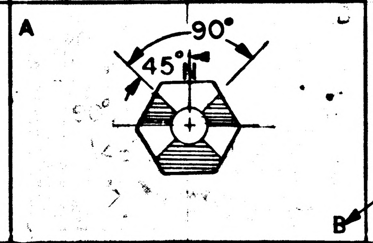
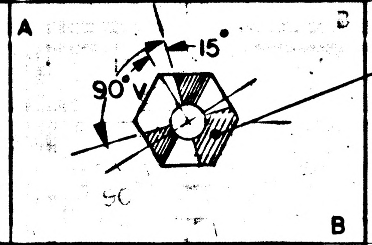
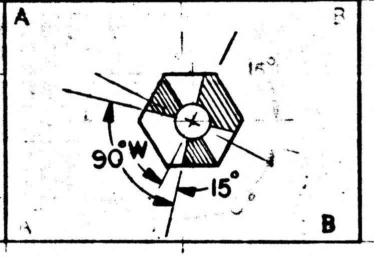
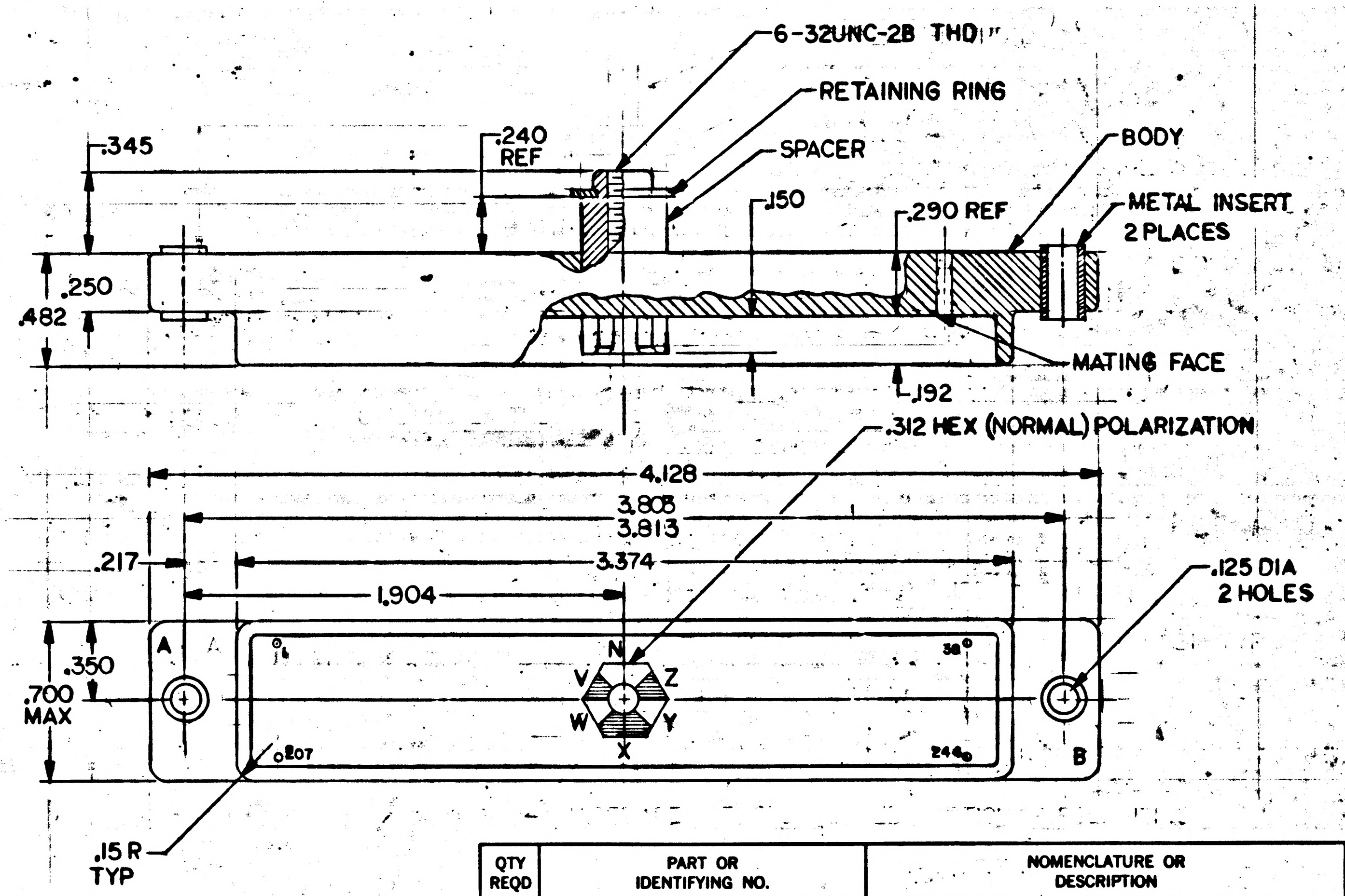
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07334	3/31/64	JFW

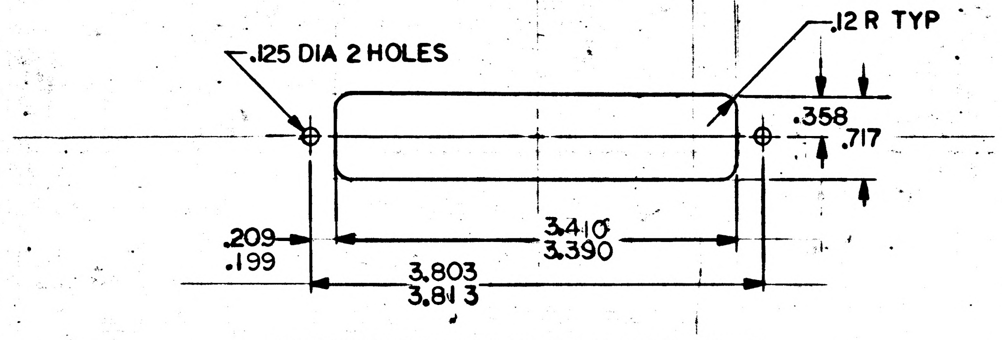
VIEWED FROM MATING FACE

NASA PART NUMBER	POLARIZING CHART
1006268-1	
1006268-2	
1006268-3	

THIS LETTER FOR END IDENT. ONLY TYP

HIGH POINTS OF POLARIZING BOSS SHADED


6-32UNC-2B THD
RETAINING RING
SPACER
BODY
METAL INSERT 2 PLACES
.345
.240 REF
.150
.290 REF
.250
.482
MATING FACE
.192
.312 HEX (NORMAL) POLARIZATION
4.128
3.808
3.813
3.374
1.904
.217
.125 DIA 2 HOLES
.350
.700 MAX
A
B
N
V
Z
W
Y
X
1
38
207
244
.15 R TYP


.125 DIA 2 HOLES
.12 R TYP
.358
.717
.209
.199
3.410
3.390
3.803
3.813

RECOMMENDED MOUNTING HOLE CUTOUT

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
±	±.010 ±.03	±

DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DMS
DRAWN S. T. Orifice DATE 12 MAR 64
CHECKED J. C. Joubert 17 Mar 64 FBW
APPROVAL
APPROVAL Eldon C Hall 31 Mar 64
NASA APPROVAL W. J. Rhine 3-31-64
MIT APPROVAL
MIT APPROVAL D. Hazel 3/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL
(244 PIN BODY)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006268
SCALE NONE	WT	SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

A 1006271

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 07499	4/7/64	WK RPK
A	REVISED PER TDRR 11070	7/28/64	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NAME OF CONTENTS, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, QUANTITY ENCLOSED AND THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. PROPERTIES:

(1) COLOR: IN ACCORDANCE WITH TABLE I.

(2) PHYSICAL STATE: LIQUID.

3. DESIGN:

A. THIS INK IS AN EPOXY BASED THERMOSETTING INK WHICH REQUIRES A CATALYST FOR CURING. CURED COLORS ARE RESISTANT TO ACIDS, ALKALIS AND SOLVENTS.

B. MIXING RATIOS: THIS INK SHALL BE MIXED IN THE PROPORTIONS SPECIFIED IN TABLE I WITH CATALYST PER NASA DRAWING 1006272

C. CURING: EPOXY DESCRIBED HEREIN WHEN MIXED WITH CATALYST PER NASA DRAWING 1006272 IN ACCORDANCE WITH TABLE I WILL AIR DRY WITHOUT HEAT IN ABOUT ONE HOUR. GOOD SOLVENT RESISTANCE IS ACHIEVED IN ABOUT 24 HOURS, AND COMPLETE CURE IS ATTAINED IN ABOUT 7 DAYS.

D. SHELF-LIFE: THIS EPOXY WHEN STORED IN CLEAN TIGHTLY CLOSED CONTAINERS AT A TEMPERATURE FROM 55°F TO 75°F SHALL HAVE A SHELF-LIFE OF TWELVE MONTHS MINIMUM FROM DATE OF RECEIPT.

TABLE I

DASH NO.	COLOR	PARTS OF CATALYST PER 100 PARTS OF INK
-1	WHITE	6
-2	FLAT WHITE	5
-3	PRIMROSE YELLOW	6
-4	MEDIUM YELLOW	6
-5	EMERALD GREEN	6
-6	MEDIUM BLUE	7.5
-7	DEEP RED	6
-8	CADMIUM RED	6
-9	MEDIUM RED	6
-10	BLACK	7
-11	FLAT BLACK	4
-12	CLEAR	9
-13	FLAT CLEAR	6

MASTER

Twelve

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Quilici DATE 11 MAR 64
CHECKED J. Wolkowicz 3 MAR 64
APPROVAL
APPROVAL Eldon C Hall 3 april 64
NASA APPROVAL 4/2/64
MIT APPROVAL 4/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INK, MARKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006271
SCALE NONE
WT
SHEET 1 OF 1

1006271 A

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006271 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 07499	4/7/64	WK RPK
A	REVISED PER TDRR 11050	7/28/64	WK
B	REVISED PER TDRR 11515	8/12/64	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NAME OF CONTENTS, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, QUANTITY ENCLOSED AND THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

   A. PROPERTIES:

      (1) COLOR: IN ACCORDANCE WITH TABLE I.

      (2) PHYSICAL STATE: LIQUID.

3. DESIGN:

   A. THIS INK IS AN EPOXY BASED THERMOSETTING INK WHICH REQUIRES A CATALYST FOR CURING. CURED COLORS ARE RESISTANT TO ACIDS, ALKALIS AND SOLVENTS.

   B. MIXING RATIOS: THIS INK SHALL BE MIXED IN THE PROPORTIONS SPECIFIED IN TABLE I WITH CATALYST PER NASA DRAWING 1006272

   C. CURING: EPOXY DESCRIBED HEREIN WHEN MIXED WITH CATALYST PER NASA DRAWING 1006272 IN ACCORDANCE WITH TABLE I WILL AIR DRY WITHOUT HEAT IN ABOUT ONE HOUR. GOOD SOLVENT RESISTANCE IS ACHIEVED IN ABOUT 24 HOURS, AND COMPLETE CURE IS ATTAINED IN ABOUT 7 DAYS.

   D. SHELF-LIFE: THIS EPOXY WHEN STORED IN CLEAN TIGHTLY CLOSED CONTAINERS AT A TEMPERATURE FROM 55°F TO 75°F SHALL HAVE A SHELF-LIFE OF TWELVE MONTHS MINIMUM FROM DATE OF RECEIPT.

TABLE I

DASH NO.	COLOR	PARTS OF CATALYST PER 100 PARTS OF INK
-1	WHITE	6
-2	FLAT WHITE	5
-3	PRIMROSE YELLOW	6
-4	MEDIUM YELLOW	6
-5	EMERALD GREEN	6
-6	MEDIUM BLUE	7.5
-7	DEEP RED	6
-8	CADMIUM RED	6
-9	MEDIUM RED	6
-10	BLACK	7
-11	FLAT BLACK	4
-12	CLEAR	9
-13	FLAT CLEAR	6

MASTER

Twelve

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S. T. [illegible] DATE 11 MAR 64
CHECKED J. Walkowicz 3 MAR 64
APPROVAL
APPROVAL Eldon C Hall 3 April 64
NASA APPROVAL 4/7/64
MIT APPROVAL 4/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INK, MARKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006271
SCALE NONE WT SHEET 1 OF 1

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

1006271 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 07499	4/7/64	WK EPM
A	REVISED PER TDRR 11050	7/28/64	WK
B	REVISED PER TDRR 11515	8/12/64	WK
C	REVISED PER TDRR 17481	4/1/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NAME OF CONTENTS, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, QUANTITY ENCLOSED AND THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. PROPERTIES:

(1) COLOR: IN ACCORDANCE WITH TABLE I.

(2) PHYSICAL STATE: LIQUID.

3. DESIGN:

A. THIS INK IS AN EPOXY BASED THERMOSETTING INK WHICH REQUIRES A CATALYST FOR CURING. CURED COLORS ARE RESISTANT TO ACIDS, ALKALIS AND SOLVENTS.

B. MIXING RATIOS: THIS INK SHALL BE MIXED IN THE PROPORTIONS SPECIFIED IN TABLE I WITH CATALYST PER NASA DRAWING 1006272
THIS MATERIAL SHALL BE THINNED TO SILK SCREENING OR BRUSHING VISCOSITY USING SCD1006274. FOR SPRAYING VISCOSITY, THE FOLLOWING BLEND SHALL BE USED:
ONE PART EACH: TOLUENE, /TT-T-548 MIBK (METHYL ISOBUTYL KETONE)/TT-M-268 AND ETHYLENE GLYCOL MONOETHYL ETHER /TT-E-781

C. CURING: EPOXY DESCRIBED HEREIN WHEN MIXED WITH CATALYST PER NASA DRAWING 1006272 IN ACCORDANCE WITH TABLE I WILL AIR DRY WITHOUT HEAT IN ABOUT ONE HOUR. GOOD SOLVENT RESISTANCE IS ACHIEVED IN ABOUT 24 HOURS, AND COMPLETE CURE IS ATTAINED IN ABOUT 24 HOURS, AND COMP TE CURE IS ATTAINED IN ABOUT 7 DAYS.

D. THIS INK SHALL NOT FLAKE, CRACK, PEEL OR SHOW ANY SIGNIFICANT LOSS OF ADHESION TO THE SUBSTRATE WHEN EXPOSED TO 99 ± 2% OXYGEN AT 5.0 ± 0.2 PSIA FOR 14 DAYS AT A TEMPERATURE OF 150° ± 5°F. TEST PANELS SHALL BE 6061-T6 ALUMINUM, ANODIZED PER MIL-A-8625 TYPE II, MARKED WITH SUITABLE CHARACTERS PER ND 1002019. VISUAL EXAMINATION SHALL BE AT 5X MAGNIFICATION. ADHESION SHALL BE DETERMINED USING #250 3M TAPE, OR EQUIVALENT.

E. SHELF-LIFE: THIS EPOXY WHEN STORED IN CLEAN TIGHTLY CLOSED CONTAINERS AT A TEMPERATURE FROM 55°F TO 75°F SHALL HAVE A SHELF-LIFE OF TWELVE MONTHS MINIMUM FROM DATE OF RECEIPT.

TABLE I

DASH NO.	COLOR	PARTS BY WEIGHT OF CATALYST PER 100 PARTS OF INK
-1	WHITE	6
-2	FLAT WHITE	5
-3	PRIMROSE YELLOW	6
-4	MEDIUM YELLOW	6
-5	EMERALD GREEN	6
-6	MEDIUM BLUE	7.5
-7	DEEP RED	6
-8	CADMIUM RED	6
-9	MEDIUM RED	6
-10	BLACK	7
-11	FLAT BLACK	4
-12	CLEAR	9
-13	FLAT CLEAR	6

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S. T. Ou[illegible] DATE 11MAR64
CHECKED J. Wal[illegible] 3MAR64
APPROVAL
APPROVAL Eldon C Hall 3 april 64
NASA APPROVAL [illegible] 4/8/64
MIT APPROVAL [illegible] 4/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INK, MARKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006271
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

– 1006271

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 07499	4/7/64	WK EPK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NAME OF CONTENTS, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, QUANTITY ENCLOSED AND THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

   A. PROPERTIES:

      (1) COLOR: IN ACCORDANCE WITH TABLE I.

      (2) PHYSICAL STATE: LIQUID.

3. DESIGN:

   A. THIS INK IS AN EPOXY BASED THERMOSETTING INK WHICH REQUIRES A CATALYST FOR CURING. CURED COLORS ARE RESISTANT TO ACIDS, ALKALIS AND SOLVENTS.

   B. MIXING RATIOS: THIS INK SHALL BE MIXED IN THE PROPORTIONS SPECIFIED IN TABLE I WITH CATALYST PER NASA DRAWING 1006272

   C. CURING: EPOXY DESCRIBED HEREIN WHEN MIXED WITH CATALYST PER NASA DRAWING 1006272 IN ACCORDANCE WITH TABLE I WILL AIR DRY WITHOUT HEAT IN ABOUT ONE HOUR. GOOD SOLVENT RESISTANCE IS ACHIEVED IN ABOUT 24 HOURS, AND COMPLETE CURE IS ATTAINED IN ABOUT 7 DAYS.

   D. SHELF-LIFE: THIS EPOXY WHEN STORED IN CLEAN TIGHTLY CLOSED CONTAINERS AT A TEMPERATURE FROM 55°F TO 75°F SHALL HAVE A SHELF-LIFE OF SIX (6) MONTHS MINIMUM FROM DATE OF RECEIPT.

TABLE I

DASH NO.	COLOR	PARTS OF CATALYST PER 100 PARTS OF INK
-1	WHITE	6
-2	FLAT WHITE	5
-3	PRIMROSE YELLOW	6
-4	MEDIUM YELLOW	6
-5	EMERALD GREEN	6
-6	MEDIUM BLUE	7.5
-7	DEEP RED	6
-8	CADMIUM RED	6
-9	MEDIUM RED	6
-10	BLACK	7
-11	FLAT BLACK	4
-12	CLEAR	9
-13	FLAT CLEAR	6

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. DATE 11MAR64
CHECKED ASM 3MAR64
APPROVAL
APPROVAL Eldon C Hall 3 april 64
NASA APPROVAL 4/8/64
MIT APPROVAL 4/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INK, MARKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006271
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006272

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 08197	5/5/64	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: INDIVIDUAL AND COLLECTIVE PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME, COMPOUND NUMBER, COMPOUND NAME, LOT CODE OR NUMBER, NET WEIGHT, EXPIRATION DATE AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

   A. PHYSICAL PROPERTIES (TYPICAL AT 77° FAHRENHEIT)

      (1) VISCOSITY: 45 CENTIPOISE (USING A BROOKFIELD VISCOSIMETER WITH A NO. 1 SPINDLE AT 20 RPM).

      (2) SPECIFIC GRAVITY: 0.97

      (3) REFRACTIVE INDEX: 1.47

      (4) COLOR: CLEAR AMBER

   B. CERTIFICATION OF CURING ABILITY: THE ABILITY OF THE BATCH OF THIS COMPOUND BEING SHIPPED TO EFFECT A PROPER CURE OF EPOXY INKS AS SPECIFIED BY ND 1006271 SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN:

   A. STORAGE LIFE: ONE (1) YEAR MINIMUM WHEN STORED IN THE ORIGINAL (TIGHTLY CLOSED) CONTAINER IN A COOL PLACE.

   B. CURING ABILITY: THIS COMPOUND SHALL CURE THE EPOXY INKS SPECIFIED ON ND 1006271 WHEN MIXED IN THE PROPORTIONS (PARTS PER 100 BY WEIGHT) SPECIFIED ON THAT DRAWING. THE CURE SHALL TAKE PLACE AT ROOM TEMPERATURE WITHIN 7 DAYS AFTER AN INITIAL ONE HOUR SOLVENT EVAPORATION PERIOD (DRYING) ALTHOUGH THE CURE AND DRYING MAY BE ACCELERATED BY THE APPLICATION OF HEAT.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. DATE 23 APR 64
CHECKED 27 Apr 64
APPROVAL 5/1
APPROVAL 1 May 64
NASA APPROVAL
MIT APPROVAL 5/5/64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CURING AGENT,
EPOXY INKS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006272
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006274 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 10270	6/17/64	
A	REVISED PER TDRR 15624	1/24/65	WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

C. CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, IDENTIFICATION OF CONTENTS, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, NET CONTENTS AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). A SUITABLE TOXICITY WARNING SHALL ALSO BE MARKED.

2. ACCEPTANCE & INSPECTION:

A. PHYSICAL PROPERTIES (AT 20°C UNLESS SPECIFIED)

(1) DENSITY: 7.55 POUNDS PER GALLON TYPICAL

(2) VISCOSITY: 1.4 CENTIPOISE TYPICAL

(3) COLOR (CLEAR): APHA 10-15 (AMERICAN PUBLIC HEALTH ASSOCIATION STANDARD) CORRESPONDS DIRECTLY TO THE UNITS USED IN PLATINUM-COBALT DETERMINATION METHODS. NO SEDIMENTS ARE ALLOWABLE.

(4) REFRACTIVE INDEX: 1.4115 TYPICAL

(5) BOILING RANGE: 250°F. -275°F.

(6) FLASH POINT (CLEVELAND OPEN CUP): 180°F. MINIMUM

B. ODOR: PLEASANT, NON-IRRITATING (BLAND)

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED IN TIGHTLY CLOSED CONTAINERS.

B. MATERIAL AND INTENDED USE: A BLEND OF GLYCOL ETHERS INTENDED TO THIN THE EPOXY INKS SPECIFIED ON NASA DRAWING 1006271. THIS THINNER IS IDENTICAL TO THE SOLVENT PORTION OF THOSE INKS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orifice DATE 6 APR 64
CHECKED A. Coggiano 13 April
APPROVAL
APPROVAL Eldon C Hall 17 June 64
NASA APPROVAL W J Rhine 6-17-64
MIT APPROVAL 6/17/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

THINNER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006274
SCALE NONE
WT
SHEET 1 OF 1

1006274 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 10270	6/17/64	
A	REVISED PER TDRR 15624	1/24/65	WR
B	REVISED PER TDRR 17367	18 Mar 65	WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

C. CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, IDENTIFICATION OF CONTENTS, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, NET CONTENTS AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). A SUITABLE TOXICITY WARNING SHALL ALSO BE MARKED.

2. ACCEPTANCE & INSPECTION:

A. DESCRIPTION:

(1) THIS MATERIAL SHALL BE BIS-B-ETHOXYETHYLETHER.

(2) THIS MATERIAL SHALL BE A CLEAR, COLORLESS LIQUID, FREE OF SEDIMENT. THE ODOR SHALL BE NON-IRRITATING.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED IN TIGHTLY CLOSED CONTAINERS.

B. MATERIAL AND INTENDED USE: THIS MATERIAL IS INTENDED TO THIN THE EPOXY INKS SPECIFIED ON NASA DRAWING 1006271 AND IS IDENTICAL TO THE SOLVENT PORTION OF THOSE INKS.

VENDOR: WORNOW PROCESS PAINT CO.
1218 LONG BEACH AVENUE
LOS ANGELES 21, CALIF.

3. DES PART NO: 50-900 CAT-L-INK THINNER

A. STORAGE LIFE: INDEFINITE WHEN STORED IN TIGHTLY CLOSED CONTAINERS.

B. MATERIAL AND INTENDED USE:
THIN THE EPOXY INKS SPECIFIED ON NASA DRAWING 1006271
IS IDENTICAL TO THE SOLVENT PORTION OF THOSE INKS.

ONLY THE ITEM LISTED AND IDENTIFIED BY VENDOR'S NAME, ADDRESS AND PART NUMBER HAVE BEEN APPROVED BY MIT INSTRUMENTATION LAB. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR TESTING AND APPROVAL BY MIT INSTRUMENTATION LAB.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DATE 6APR64
CHECKED A. Coggiano 13 April
APPROVAL
APPROVAL Eldon C Hall 17 June 64
NASA APPROVAL W J Rhine 6-17-64
MIT APPROVAL 6/17/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

THINNER

SOURCE CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
—	C	1006274	
SCALE NONE	WT		SHEET 1 OF 1

—	1006274

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 10270	6/17/64	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   C. CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, IDENTIFICATION OF CONTENTS, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, NET CONTENTS AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). A SUITABLE TOXICITY WARNING SHALL ALSO BE MARKED.

2. ACCEPTANCE & INSPECTION:

   A. PHYSICAL PROPERTIES (AT 20°C UNLESS SPECIFIED)

      (1) DENSITY: 7.55 POUNDS PER GALLON TYPICAL

      (2) VISCOSITY: 1.4 CENTIPOISE TYPICAL

      (3) COLOR (CLEAR): APHA 10-15 (AMERICAN PUBLIC HEALTH ASSOCIATION STANDARD) CORRESPONDS DIRECTLY TO THE UNITS USED IN PLATINUM-COBALT DETERMINATION METHODS. NO SEDIMENTS ARE ALLOWABLE.

      (4) REFRACTIVE INDEX: 1.4115 TYPICAL

      (5) BOILING RANGE: 350°F. - 375°F.

      (6) FLASH POINT (CLEVELAND OPEN CUP): 180°F. MINIMUM

   B. ODOR: PLEASANT, NON-IRRITATING (BLAND)

3. DESIGN:

   A. STORAGE LIFE: INDEFINITE WHEN STORED IN TIGHTLY CLOSED CONTAINERS.

   B. MATERIAL AND INTENDED USE: A BLEND OF GLYCOL ETHERS INTENDED TO THIN THE EPOXY INKS SPECIFIED ON NASA DRAWING 1006271. THIS THINNER IS IDENTICAL TO THE SOLVENT PORTION OF THOSE INKS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN S.T. Cailie DATE 6APR64
CHECKED A. Cogg 13 April
APPROVAL
APPROVAL Eldon C Hall 17 June 64
NASA APPROVAL W J Rhine 6-17-64
MIT APPROVAL L Walsh 6/17/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

THINNER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006274
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

—	1006275

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 11227	7/20/64	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

TABLE I

DASH NO.	WIRE DIMENSIONS			
	SIZE AWG	BARE WIRE DIA MAX/MIN	MINIMUM DIA INCREASE FOR INSULATION	MAXIMUM OVERALL DIAMETER
-1	NO. 34	.0064 .0062	.0010	.0078
-2	NO. 38	.0041 .0039	.0007	.0051

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. WIRE DESCRIBED HEREIN SHALL MEET THE REQUIREMENTS OF NEMA STANDARD MW-17, HEAVY INSULATION, AND MIL-W-583 ,TYPE T2

   C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. MARKING: UNIT SPOOLS/REELS AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME, IDENTIFYING NUMBER, ITEM DESCRIPTION AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION:

   A. ELECTRICAL CHARACTERISTICS:

      (1) DIELECTRIC STRENGTH: 1500 VOLTS RMS/MIL MINIMUM

   B. MECHANICAL:

      (1) VISUAL AND MECHANICAL: IN ACCORDANCE WITH NEMA MW-17 AND MIL-W-583 AND THIS DRAWING

   C. CERTIFICATION: COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN:

   A. OPERATING TEMPERATURE: 105° MAX

   B. CONSTRUCTION:

      (1) CONDUCTOR: SOLID, ROUND COPPER WIRE

      (2) INSULATION: VINYL-ACETAL RESIN BAKED VARNISH

      (3) JACKET: HEAT-STABILIZED PLASTIC FILM (NYLON).

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Dulic DMS DATE 2 July 64
CHECKED [illegible] 2 Jul 64
APPROVAL D J Diggins
APPROVAL
NASA APPROVAL [illegible]
MIT APPROVAL
MIT APPROVAL W Kupfer 24 Jul 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL MAGNET
FILM INSULATION (T2)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006275
SCALE NONE	WT	SHEET 1 OF 1

1006275

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006277

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 08551	5-19-64	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THIS PRODUCT SHALL CONFORM TO THE REQUIREMENTS OF MIL-S-15192A EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED BELOW.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED EXTERNALLY AND/OR INTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, COMPOUND NUMBER, NET WEIGHT, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

   A. APPEARANCE: THIS SILICA SHALL BE A WELL PULVERIZED WHITE POWDER.

   B. CHEMICAL COMPOSITION: 99.0% SILICA (SiO_2) MINIMUM

   C. PHYSICAL PROPERTIES (PERCENT BY WEIGHT)

      (1) IGNITION LOSS (AT 1000°C ON A MOISTURE FREE BASIS): 1.0% MAXIMUM

      (2) COARSE PARTICLES: 0.02% MAXIMUM

      (3) HYDROGEN ION CONCENTRATION (PH): 3.5 - 4.2 FOR A 4% (BY WEIGHT) AQUEOUS DISPERSION.

      (4) POUR DENSITY: 2.3 POUNDS PER CUBIC FOOT MAXIMUM (43.48 CUBIC FEET PER 100 POUNDS).

      (5) FREE MOISTURE (AT 105°C): 1.0% MAXIMUM

   D. CERTIFICATION: COMPLIANCE WITH THE PHYSICAL DESIGN REQUIREMENTS SPECIFIED BELOW SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN:

   A. PHYSICAL PROPERTIES (TYPICAL)

      (1) PARTICLE SIZE (AVERAGE): 0.015 MICRONS

      (2) MEASURED PARTICLE SURFACE AREA: 175-225 SQUARE METERS PER GRAM.

      (3) SPECIFIC GRAVITY: 2.2

      (4) REFRACTIVE INDEX: 1.46

      (5) BULKING VALUE: 5.5 GALLONS PER 100 POUNDS (.735 CUBIC FEET PER 100 POUNDS)

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN G A Bishop DATE 29 Apr 64
CHECKED 29 APR 64
APPROVAL
APPROVAL Ellen C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICA, PULVERIZED, PYROGENIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006277
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

–	1006281

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 11514		

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, PART NUMBER, NET CONTENTS, DATE OF MANUFACTURE OR CODING, EXPIRATION DATE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION:

A. THIS DRAWING IDENTIFIES A TWO COMPONENT POLYURETHANE PLASTIC FOAM CONSISTING OF A PLASTIC RESIN AND A CURING AGENT. THE COMPONENTS ARE SUPPLIED IN THE RATIO OF 39 PARTS RESIN AND 61 PARTS CURING AGENT BY WEIGHT.

B. PROPERTIES (AS RECEIVED):

(1) RESIN:

APPEARANCE: YELLOWISH LIQUID

(2) CURING AGENT:

APPEARANCE: YELLOWISH LIQUID

C. PROPERTIES (CURED): THE TWO COMPONENTS, WHEN MIXED AND CURED (UNCONTAINED) AT ROOM TEMPERATURE FOR ONE-HALF HOUR, SHALL FORM A PLASTIC MATERIAL (CLOSED CELL FOAM) HAVING THE FOLLOWING PROPERTIES:

(1) NOMINAL DENSITY: 6 POUNDS/CU. FT. PER ASTM D792-50.

(2) COMPRESSIVE STRENGTH: 120 POUNDS/SQ. IN. MINIMUM PER ASTM D695-54.

(3) TENSILE STRENGTH: 120 POUNDS/SQ. IN. MINIMUM PER ASTM D638-58T.

(4) SHEAR STRENGTH: 100 POUNDS/SQ. IN. MINIMUM PER ASTM D732-46.

DASH NO.	MATERIAL
-1	RESIN
-2	CURING AGENT

3. DESIGN:

A. PROPERTIES (CURED): THE TWO COMPONENTS, WHEN MIXED AND CURED (UNCONTAINED) AT ROOM TEMPERATURE FOR ONE-HALF HOUR, SHALL FORM A PLASTIC MATERIAL (CLOSED CELL FOAM) HAVING THE FOLLOWING PROPERTIES:

(1) K FACTOR: 0.25 BTU/HR/FT^2/°F/IN. MAXIMUM PER ASTM C177-45.

(2) MAXIMUM SERVICE TEMPERATURE: 180°F.

(3) CLOSED CELL CONTENT: 95% MINIMUM

(4) WATER SORPTION (10 FT HEAD FOR ONE WEEK): .035 POUNDS/SQ FT.

B. SHELF-LIFE: WHEN STORED IN CLEAN, TIGHTLY CLOSED CONTAINERS IN TEMPERATURES BETWEEN 55°F AND 75°F, THE SHELF LIFE SHALL NOT BE LESS THAN SIX (6) MONTHS.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. DATE 22 July 64
CHECKED J. M. 20 July
APPROVAL 11 Aug 64
APPROVAL
NASA APPROVAL 8/12/65
MIT APPROVAL 12 Aug 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESIN, URETHANE FOAM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006281
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WK
A	REVISED PER TDRR 15734	2/2/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

E. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING:

NASA DRAWING NUMBER, DASH ~~NUMBER~~ AND ~~REVISION~~ REVISION LETTER.

DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).

DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.

MUST OPERATE CURRENT, MAXIMUM.

SCHEMATIC DIAGRAM.

BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.

(2) UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) MATERIAL CERTIFICATION: A CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

(2) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN.

(3) MARKING: PER NOTE 1.E.

(4) LEAK RATE: UNITS SHALL BE DEGASSED, BACK FILLED TO ONE ATMOSPHERE PRESSURE (ABSOLUTE) WITH DRY NITROGEN (90%) AND HELIUM (10%) GASES, AND HERMETICALLY SEALED. 100 PERCENT OF THE UNITS SHALL BE TESTED PER MIL-STD-202, METHOD 112, TEST CONDITION C, PROCEDURE IV. THE LEAK RATE SHALL BE LESS THAN 10^{-8} CUBIC CENTIMETERS/SECOND AT 1 ATMOSPHERE PRESSURE DIFFERENTIAL.

(5) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MINIMUM.

C. ELECTRICAL REQUIREMENTS:

(1) COIL CURRENT: MUST OPERATE (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH:

(a) AT SEA LEVEL: 1000 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS. 500 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS AND BETWEEN COILS AND BETWEEN COILS AND FRAME.

(5) INSULATION RESISTANCE: 1,000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS. OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (1000 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

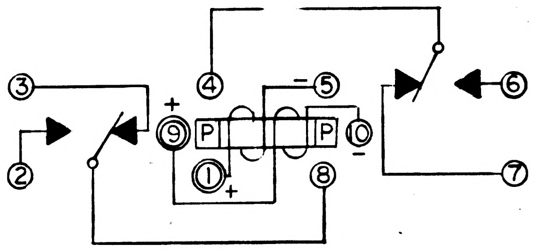
(6) OPERATE AND RELEASE TIME: EACH 3 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.

(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

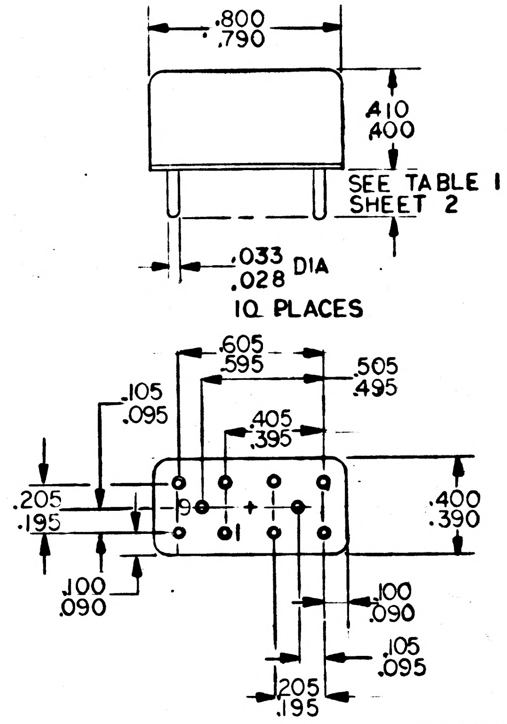
(8) CONTACT BOUNCE: 2.0 MILLISECONDS MAXIMUM.

(9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

SCHEMATIC AND PIN LAYOUT
(FOR REFERENCE ONLY)



+VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 16 June 64
CHECKED 18 June 64
APPROVAL
APPROVAL Eldon C Hall 6 Oct 64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL
MIT APPROVAL 6 Oct 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006282
SCALE NONE WT SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006282 | A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WK
A	REVISED PER TDRR 15734	2/2/65	WK

NOTES (CONTINUED)

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL CURRENT, MAX CONTINUOUS: IN ACCORDANCE WITH TABLE I.

(3) MAXIMUM COIL POWER: 0.60 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.25 WATTS PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(4) CONTACT RATING (PER POLE): 0.5 AMPERES AT 32 VOLTS DC (INDUCTIVE LOAD) OR 1 AMPERES AT 115 VOLTS RMS, 400 CPS, (RESISTIVE LOAD, CASE NOT GROUNDED) OR 0.25 AMPERES (CASE GROUNDED).

CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS OF 1.0 MICROAMPERE AT 1.0 MILLIVOLT WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD. CONTACT RESISTANCE SHALL BE 100 OHMS MAXIMUM.

(5) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.

(6) DIELECTRIC STRENGTH (AT 70,000 FEET): 450 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: APPLICABLE FOR RATED LOAD.

(3) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH MIL-STD-1276, TYPE K.

(4) CASE: ALL-WELDED CONNECTIONS WITH A HERMETICALLY SEALED CASE. CASE MATERIAL SHALL BE CUPRO-NICKEL.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 98 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1,3,6,7,8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

COIL PARAMETERS

DASH NO.	RESISTANCE AT 25°C OHMS ± 10%	MUST OPERATE CURRENT MADC MAXIMUM (EITHER DIRECTION)	MAX CONT CURRENT AT +125°C MADC	SUGGESTED SOURCE VOLTAGE VDC NOM	MINIMUM PULL-IN POWER (SENSITIVITY) MW NOM	LEAD LENGTH MAX/MIN
-1	190	30	30	12	175	.210/.190
-2	850	15	18	26	175	.210/.190

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 16 June
CHECKED 18 June 64
APPROVAL
APPROVAL Eldon C Hall 6 Oct 64
NASA APPROVAL W J 10-6-64
MIT APPROVAL
MIT APPROVAL 6 Oct 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE, MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006282
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006282 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WK
A	REVISED PER TDRR 15734	2/2/65	WK
B	REVISED PER TDRR 17819	6/9/65	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. THIS UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

   E. MARKING:

      (1) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING:

         NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

         DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).

         DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.

         MUST OPERATE CURRENT, MAXIMUM.

         SCHEMATIC DIAGRAM.

         BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.

      (2) UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

2. ACCEPTANCE AND INSPECTION:

   A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

   B. MECHANICAL REQUIREMENTS:

      (1) MATERIAL CERTIFICATION: A CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

      (2) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN.

      (3) MARKING: PER NOTE 1.E.

      (4) LEAK RATE: UNITS SHALL BE DEGASSED, BACK FILLED TO ONE ATMOSPHERE PRESSURE (ABSOLUTE) WITH DRY NITROGEN (90%) AND HELIUM (10%) GASES, AND HERMETICALLY SEALED. 100 PERCENT OF THE UNITS SHALL BE TESTED PER MIL-STD-202, METHOD 112, TEST CONDITION C, PROCEDURE IV. THE LEAK RATE SHALL BE LESS THAN 10^{-8} CUBIC CENTIMETERS/SECOND AT 1 ATMOSPHERE PRESSURE DIFFERENTIAL.

      (5) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MINIMUM.

   C. ELECTRICAL REQUIREMENTS:

      (1) COIL CURRENT: MUST OPERATE (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.

      (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

      (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

      (4) DIELECTRIC STRENGTH:

         (a) AT SEA LEVEL: 1000 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS. 500 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS AND BETWEEN COILS AND BETWEEN COILS AND FRAME.

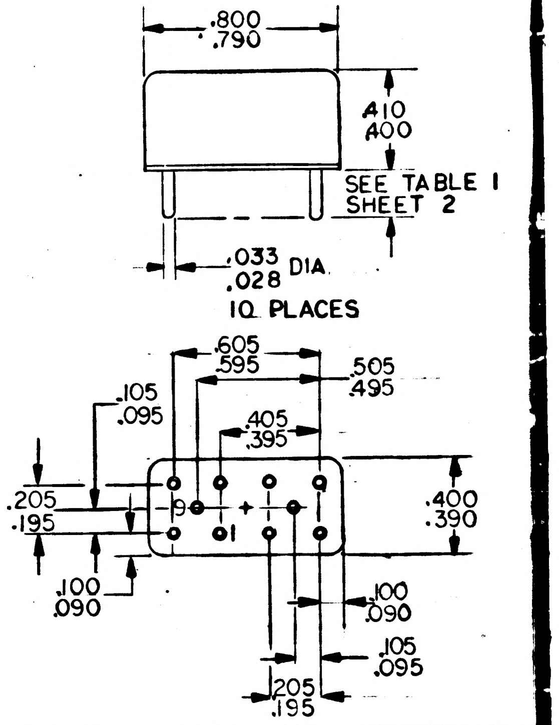
      (5) INSULATION RESISTANCE: 1,000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS. OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (1000 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

      (6) OPERATE TIME, BOTH DIRECTIONS: EACH 3 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.

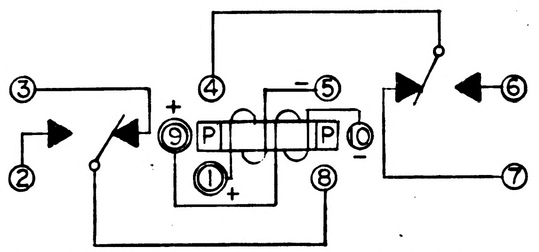
      (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

      (8) CONTACT BOUNCE: 2.0 MILLISECONDS MAXIMUM.

      (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.



SCHEMATIC AND PIN LAYOUT
(FOR REFERENCE ONLY)



+VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 16 June 64
CHECKED 18 June 64
APPROVAL
APPROVAL Eldon C Hall 6 Oct 64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL
MIT APPROVAL 6 Oct 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006282
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006282 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WK
A	REVISED PER TDRR 15734	2/2/65	WK
B	REVISED PER TDRR 17819	6 Jan 65	WK

NOTES (CONTINUED)

3. DESIGN:

   A. ELECTRICAL RATINGS:

      (1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

      (2) COIL CURRENT, MAX CONTINUOUS: IN ACCORDANCE WITH TABLE I.

      (3) MAXIMUM COIL POWER: 0.60 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.25 WATTS PER COIL AT PLUS 125 DEGREES CENTIGRADE.

      (4) CONTACT RATING (PER POLE): 0.5 AMPERES AT 32 VOLTS DC (INDUCTIVE LOAD) OR 1 AMPERES AT 115 VOLTS RMS, 400 CPS, (RESISTIVE LOAD, CASE NOT GROUNDED) OR 0.25 AMPERES (CASE GROUNDED) OR 1.0 MILLIAMPERE AT 250 VRMS, 800 CPS, AT A POWER FACTOR OF NOT MORE THAN 0.35 (CASE NOT GROUNDED). CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS OF 1.0 MICROAMPERE AT 1.0 MILLIVOLT WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD. CONTACT RESISTANCE SHALL BE 100 OHMS MAXIMUM.

      (5) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.

      (6) DIELECTRIC STRENGTH (AT 70,000 FEET): 450 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

   B. CONSTRUCTION:

      (1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

      (2) CONTACT MATERIAL: APPLICABLE FOR RATED LOAD.

      (3) LEAD MATERIAL: LEAD MATERIAL SHALL BE GOLD PLATED IRON-NICKEL ALLOY(DUMET) IN ACCORDANCE WITH PS 1015401.

      (4) CASE: ALL-WELDED CONNECTIONS WITH A HERMETICALLY SEALED CASE. CASE MATERIAL SHALL BE CUPRO-NICKEL.

   C. QUALIFICATION REQUIREMENTS:

      (1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

   D. ENVIRONMENTAL REQUIREMENTS:

      (1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 98 PERCENT.

      (2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

      (3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

      (4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

   A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

      (1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

      (2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

      (3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

      (4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

      (5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

      (6) CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

      (7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1,3,6,7,8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

COIL PARAMETERS

DASH NO.	RESISTANCE AT 25°C OHMS ± 10%	MUST OPERATE CURRENT MADC MAXIMUM (EITHER DIRECTION)	MAX CONT CURRENT AT +125°C MADC	SUGGESTED SOURCE VOLTAGE VDC NOM	MINIMUM PULL-IN POWER (SENSITIVITY) MW NOM	LEAD LENGTH MAX/MIN
-1	190	30	30	12	175	.210/.190
-2	850	15	18	26	175	.210/.190

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [illegible] DATE 16 June 64
CHECKED T.D. [illegible] 16 June 64
APPROVAL
APPROVAL Ellas C. Hall 6 Oct 64
NASA APPROVAL W. J. [illegible] 10-6-64
MIT APPROVAL
MIT APPROVAL W. [illegible] 6 Oct 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006282
SCALE NONE WT SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WK
A	REVISED PER TDRR 15734	2/2/65	WK
B	REVISED PER TDRR 17819	6/9/65	WK
C	REVISED PER TDRR 24588	12/14/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

E. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING:

NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).

DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.

MUST OPERATE CURRENT, MAXIMUM.

SCHEMATIC DIAGRAM.

BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.

(2) UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) MATERIAL CERTIFICATION: A CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

(2) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN.

(3) MARKING: PER NOTE 1.E.

(4) LEAK RATE: UNITS SHALL BE DEGASSED, BACK FILLED TO ONE ATMOSPHERE PRESSURE (ABSOLUTE) WITH DRY NITROGEN (90%) AND HELIUM (10%) GASES, AND HERMETICALLY SEALED. 100 PERCENT OF THE UNITS SHALL BE TESTED PER MIL-STD-202, METHOD 112, TEST CONDITION C, PROCEDURE IV. THE LEAK RATE SHALL BE LESS THAN 10^{-8} CUBIC CENTIMETERS/SECOND AT 1 ATMOSPHERE PRESSURE DIFFERENTIAL.

(5) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MINIMUM.

C. ELECTRICAL REQUIREMENTS:

(1) COIL VOLTAGE : MUST LATCH (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH:

(a) AT SEA LEVEL: 1000 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS. 500 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS AND BETWEEN COILS AND BETWEEN COILS AND FRAME.

(5) INSULATION RESISTANCE: 1,000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS. OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (1000 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

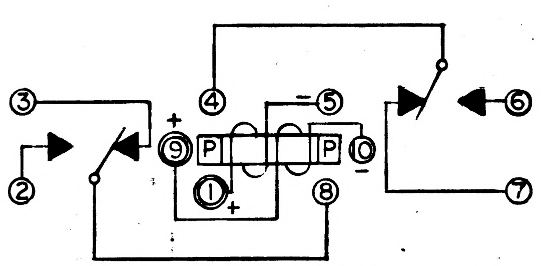
(6) OPERATE TIME, BOTH DIRECTIONS: EACH 10 MILLISECONDS MAXIMUM UNDER ALL CONDITIONS SPECIFIED IN TABLE 1

(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

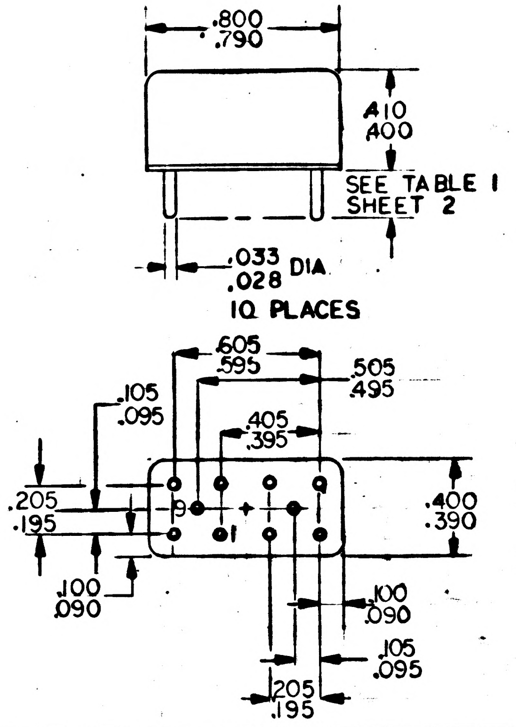
(8) CONTACT BOUNCE: 2.0 MILLISECONDS MAXIMUM.

(9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

SCHEMATIC AND PIN LAYOUT
(FOR REFERENCE ONLY)



+VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT
DRAWN DATE 16 June 64
CHECKED L. D. Fagan 18 June 64
APPROVAL
APPROVAL Eldon C Hall 6 Oct 64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL
MIT APPROVAL W Kupfer 6 Oct 64

MANNED SPACECRAFT CENTER
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RELAY, ARMATURE, MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006282
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WK
A	REVISED PER TDRR 15734	2/2/65	WK
B	REVISED PER TDRR 17819	6/ /65	WK
C	REVISED PER TDRR 24588	12/14/66	WK

NOTES (CONTINUED)

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL CURRENT, MAX CONTINUOUS: IN ACCORDANCE WITH TABLE I.

(3) MAXIMUM COIL POWER: 0.60 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.25 WATTS PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(4) SEE TABLE II

(5) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.

(6) DIELECTRIC STRENGTH (AT 70,000 FEET): 450 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: APPLICABLE FOR RATED LOAD.

(3) LEAD MATERIAL: LEAD MATERIAL SHALL BE GOLD PLATED IRON-NICKEL ALLOY(DUMET) IN ACCORDANCE WITH PS 1015401.

(4) CASE: ALL-WELDED CONNECTIONS WITH A HERMETICALLY SEALED CASE. CASE MATERIAL SHALL BE CUPRO-NICKEL.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 98 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1,3,6,7,8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

COIL PARAMETERS					
DASH NO.	NORMAL RATED COIL VOLTAGE VOLTS D.C.	LATCHING VOLTAGE (VOLTS D.C.)		COIL RESISTANCE	LEAD LENGTH
		MAX OVER TEMP RANGE PER NOTE 3-D-2	MIN (OVER AMBIENT TEMP RANGE)	RANGE AT +25°C (OHMS)	MAX/MIN
-1	12	10	2.0	170 TO 235	.210/.190
-2	26	18	5.0	765 TO 990	.210/.190

TABLE II

LOAD VOLTAGE	28 VDC		115VRMS, 60CPS		115VRMS, 400CPS		115/200 VRMS, 60CPS		115/200VRMS, 400CPS		SEE NOTE 2 SHEET 2
COIL VOLTAGE	NORMAL	PULL-IN	NORMAL	PULL-IN	NORMAL	PULL-IN	NORMAL	PULL-IN	NORMAL	PULL-IN	
RESISTIVE	2.0	2.0	1.0	0.6	1.0	1.0	0.5	0.3	0.75	0.5	
INDUCTIVE	0.5	0.5	0.5	0.5	0.75	0.5	0.5	0.25	0.75	0.25	SEE NOTE 1 SHEET 2
LAMP	0.5	0.5	0.5	0.2	0.5	0.2 (0.5*)	0.3	0.2	0.3	0.2	
MINIMUM	0.1	0.1	-	-	-	-	-	-	-	-	

* 5VRMS, 400 CPS

NOTE 1. INDUCTIVE LOAD LIMITED TO $\frac{L}{R} \leq$ .008 SEC W_L = 100 MILLI JOULES POWER FACTOR 50% FOR A.C.

NOTE 2. ALL AC RATINGS ARE GIVEN FOR UNGROUNDED CASE ONLY.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DRAWN DATE 16 June 64
CHECKED
APPROVAL
APPROVAL Elmer C Hall 6 Oct 64
NASA APPROVAL W J 10-6-64
MIT APPROVAL
MIT APPROVAL 6 Oct 64

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RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006282
SCALE NONE
WT
SHEET 2 OF 2

MASTER

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-	1006282

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

E. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING:

NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).

DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.

MUST OPERATE CURRENT, MAXIMUM.

SCHEMATIC DIAGRAM.

BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.

(2) UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) MATERIAL CERTIFICATION: A CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

(2) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN.

(3) MARKING: PER NOTE 1.E.

(4) LEAK RATE: UNITS SHALL BE DEGASSED, BACK FILLED TO ONE ATMOSPHERE PRESSURE (ABSOLUTE) WITH DRY NITROGEN (90%) AND HELIUM (10%) GASES, AND HERMETICALLY SEALED. 100 PERCENT OF THE UNITS SHALL BE TESTED PER MIL-STD-202, METHOD 112, TEST CONDITION C, PROCEDURE IV. THE LEAK RATE SHALL BE LESS THAN 10^{-8} CUBIC CENTIMETERS/SECOND AT 1 ATMOSPHERE PRESSURE DIFFERENTIAL.

(5) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MINIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

C. ELECTRICAL REQUIREMENTS:

(1) COIL CURRENT: MUST OPERATE (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH:

(a) AT SEA LEVEL: 1000 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS. 500 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS AND BETWEEN COILS AND BETWEEN COILS AND FRAME.

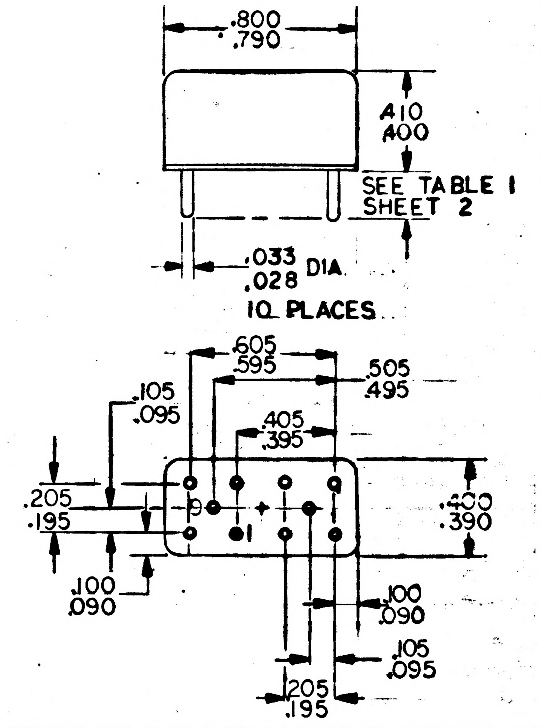
(5) INSULATION RESISTANCE: 1,000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS. OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (1000 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

(6) OPERATE AND RELEASE TIME: EACH 3 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.

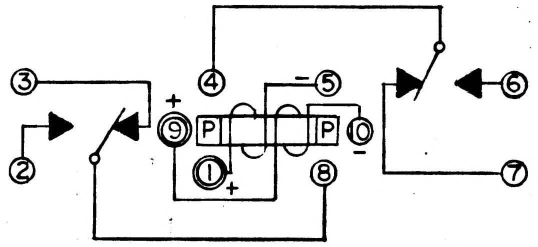
(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

(8) CONTACT BOUNCE: 2.0 MILLISECONDS MAXIMUM.

(9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.



SCHEMATIC AND PIN LAYOUT
(FOR REFERENCE ONLY)



+ VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
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CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN DATE 6 June 64
CHECKED L. P. Fergus 12 June 64
APPROVAL
APPROVAL Eldon C Hall 6 Oct 64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL
MIT APPROVAL 6 Oct 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006282
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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—	1006282

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13248	10-6-64	WK

NOTES (CONTINUED)

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL CURRENT, MAX CONTINUOUS: IN ACCORDANCE WITH TABLE I.

(3) MAXIMUM COIL POWER: 0.60 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.25 WATTS PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(4) CONTACT RATING (PER POLE): 0.5 AMPERES AT 32 VOLTS DC (INDUCTIVE LOAD) OR 2 AMPERES AT 115 VOLTS RMS, 60 OR 400 CPS, (RESISTIVE LOAD, CASE NOT GROUNDED) OR 0.25 AMPERES (CASE GROUNDED).

CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS OF 1.0 MICROAMPERE AT 1.0 MILLIVOLT WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD. CONTACT RESISTANCE SHALL BE 100 OHMS MAXIMUM.

(5) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.

(6) DIELECTRIC STRENGTH (AT 70,000 FEET): 450 VOLTS RMS MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: APPLICABLE FOR RATED LOAD.

(3) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH MIL-STD-1276, TYPE K.

(4) CASE: ALL-WELDED CONNECTIONS WITH A HERMETICALLY SEALED CASE. CASE MATERIAL SHALL BE CUPRO-NICKEL.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 98 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1,3,6,7,8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

COIL PARAMETERS						
DASH NO.	RESISTANCE AT 25°C OHMS ± 10%	MUST OPERATE CURRENT MADC MAXIMUM (EITHER DIRECTION)	MAX CONT CURRENT AT +125°C MADC	SUGGESTED SOURCE VOLTAGE VDC NOM	MINIMUM PULL-IN POWER (SENSITIVITY) MW NOM	LEAD LENGTH MAX/MIN
-1	190	30	30	12	175	.210/.190

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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TOLERANCES ON
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DO NOT SCALE THIS DRAWING
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DWG. NO. CONTRACT
DRAWN DATE 16 June
CHECKED
APPROVAL
APPROVAL 6 Oct 64
NASA APPROVAL 10-6-64
MIT APPROVAL
MIT APPROVAL 6 Oct 64

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RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006282
SCALE NONE
WT
SHEET 2 OF 2

1006282

INCHES
0 1 2
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- 1006289

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 11513		

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REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE LEGIBLY MARKED INTERNALLY AND/OR EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PART NUMBER, COMPOUND IDENTIFICATION, NET CONTENTS, DATE OF MANUFACTURE, EXPIRATION DATE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). A SUITABLE TOXICITY WARNING SHALL ALSO BE INCLUDED.

2. ACCEPTANCE AND INSPECTION:

   A. PHYSICAL PROPERTIES (AT 75°F):

      (1) VISCOSITY: 7,000 TO 12,000 CENTIPOISE (BROOKFIELD)

      (2) SPECIFIC GRAVITY: 0.97 ± 0.01

      (3) COLOR: CLEAR DARK AMBER

3. DESIGN:

   A. STORAGE LIFE: ONE YEAR MINIMUM WHEN STORED IN UNOPENED CONTAINERS AT TEMPERATURES BELOW 100°F.

   B. TYPE OF CURING AGENT: A PROPRIETARY IMIDAZOLAZOLINE TYPE SUITABLE FOR CURING EPOXY RESIN PER NASA DRAWING 1006288.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DWG. NO.
CONTRACT NAS 9-4065
DRAWN DATE 28 JULY 64
CHECKED 29 JUL 64
APPROVAL E. T. Duncan 11 Aug 64
APPROVAL
NASA APPROVAL 8/12/64
MIT APPROVAL
MIT APPROVAL W. Kupfer 12 August

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CURING AGENT, EPOXY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006289
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
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1006290 -

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS # 13251 PER TDRR	10-1-64	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002054.

   E. MARKING:

      (1) UNITS: DIODES SHALL BE MARKED WITH COLORED BANDS IN ACCORDANCE WITH MIL-S-19500 DENOTING THE TYPE AND INDICATING THE POSITIVE LEAD.

      (2) PACKAGE: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY PER MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT NUMBER, DATE OF MANUFACTURE, AND THE NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION: (SAMPLE)

   A. LEAD MATERIAL: LEADS SHALL BE IRON-NICKEL ALLOY (DUMET) PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

   B. ELECTRICAL CHARACTERISTICS PER TABLE I:

      (1) ZENER VOLTAGE (V_Z)

      (2) ZENER IMPEDANCE (Z_{ZT}) (Z_{ZK})

3. DESIGN:

   A. MAXIMUM RATINGS:

      (1) POWER DISSIPATION: 400 MILLIWATTS (SEE DERATING CURVE)

      (2) STORAGE TEMPERATURE: FROM MINUS 65°C TO PLUS 150°C

      (3) OPERATING TEMPERATURE: FROM MINUS 65°C TO PLUS 125°C

      (4) TEMPERATURE COEFFICIENT: PLUS OR MINUS .001 PERCENT PER DEGREE CENTIGRADE FROM ZERO TO 75°C WITH A ZENER CURRENT OF 4.0 MA

   B. ENCLOSURE: GLASS, HERMETICALLY SEALED

4. SPECIAL CONDITIONING BY SUPPLIER:

   A. UNITS SHALL BE BURNED-IN FOR 240 HOURS UNDER THE FOLLOWING CONDITIONS:

      (1) AMBIENT TEMPERATURE: 100°C PLUS OR MINUS 5°C.

      (2) ZENER CURRENT: 15 MA

      (3) POWER = 135 MW MINIMUM

   B. THE MANUFACTURER SHALL RECORD THE ELECTRICAL CHARACTERISTICS PER TABLE I PRIOR TO AND FOLLOWING BURN-IN. DATA SHALL BE SUPPLIED WITH THE PARTS.

   C. PARAMETRIC CHANGE LIMITS:

      (1) ZENER VOLTAGE (V_Z): PLUS OR MINUS 1.0 PERCENT OF INITIAL VALUE.

      (2) ZENER IMPEDANCE (Z_{ZK}): PLUS OR MINUS 10 PERCENT OF INITIAL VALUE.

      (3) ZENER IMPEDANCE (Z_{ZT}): PLUS OR MINUS 10 PERCENT OF INITIAL VALUE OR 2 OHM, WHICHEVER IS GREATER.

   D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE SHIPPED

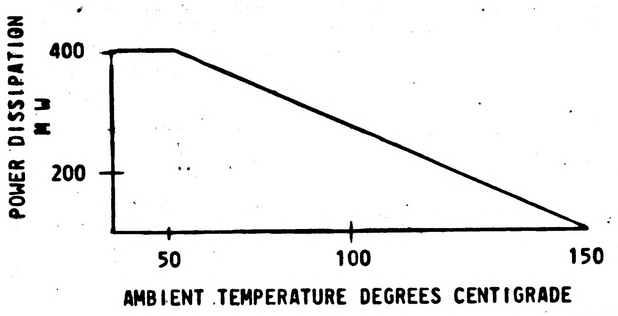
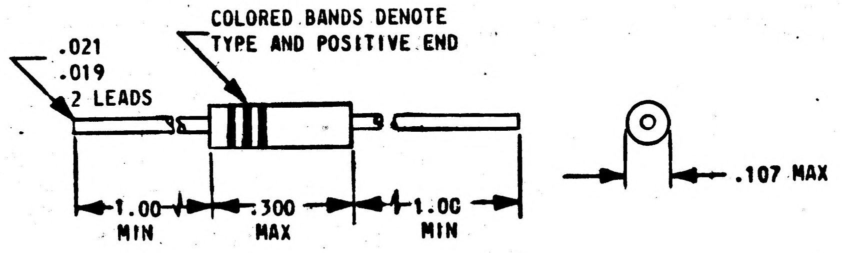


TABLE I

ELECTRICAL CHARACTERISTICS AT 25°C UNLESS OTHERWISE SPECIFIED					
PARAMETER	CONDITIONS	SYMBOL	LIMITS		
			MIN	MAX	UNITS
ZENER VOLTAGE	I_{ZT} = 4 MA ± .5 MA	V_Z	8.55	9.45	VOLT
ZENER IMPEDANCE	I_{ZT} = 4 MA ± .5 MA	Z_{ZT}		25	OHM
ZENER IMPEDANCE	I_{ZT} = 1.0 MA	Z_{ZK}		200	OHM



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LIST OF MATERIALS

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DWG. NO.
CONTRACT NAS9-498
DRAWN [illegible] DATE 29 JULY 64
CHECKED [illegible] 16 SEP 64
APPROVAL
APPROVAL Eldon C Hall 2 Oct 64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL
MIT APPROVAL [illegible] 6 Oct 64

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

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SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
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4 3 2 1

A 1006291

REVISIONS	15260		
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 15260		wk
A	REVISED PER TDRR 15623	1/26/65	wk.

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE SUPPLIERS BEST COMMERICAL PRACTICE.

C. PARTS: SHALL BE PART NUMBER P30/50/15/01 AS SUPPLIED BY FERROXCUBE CORP. OF AMERICA AND SELECTED FOR ELECTRICAL CHARACTERISTICS PER THIS DRAWING

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

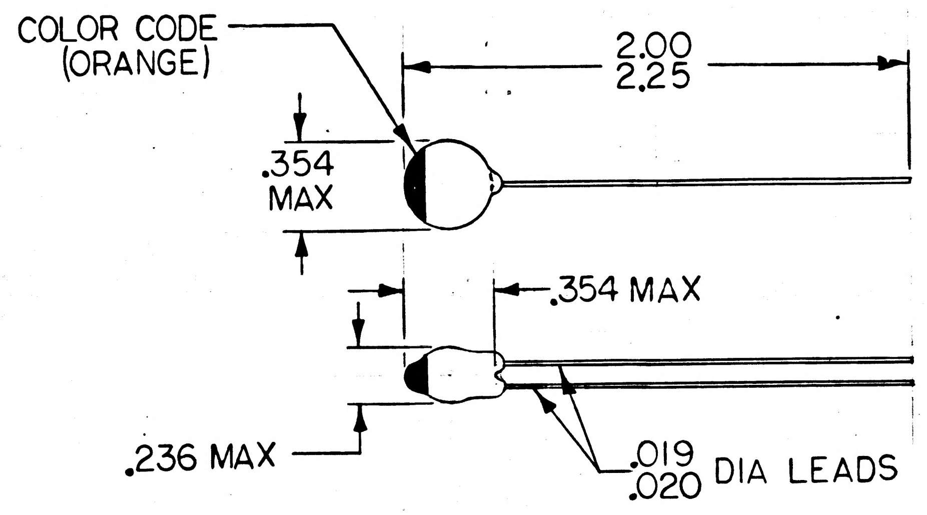
(1) DIMENSIONS: AS DELINEATED HEREIN.

B. ELECTRICAL REQUIREMENTS:

(1)

(2) RESISTANCE VALUE VS TEMPERATURE: ZERO-POWER CHARACTERISTIC

TEMPERATURE °C	25	50	70
RESISTANCE OHMS	20 MIN 40 MAX	80 MAX	800 MIN



MASTER

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NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
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FINAL FINISH

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LIST OF MATERIALS

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DWG. NO. CONTRACT

DRAWN PM DATE 25AUG64
CHECKED A Caggiano 26 Aug 64
APPROVAL
APPROVAL Eldon C Hall 20 Nov 64
NASA APPROVAL W J Rhine 1-5-65
MIT APPROVAL 5 Jan 65

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RESISTOR, THERMAL-POS TEMP COEF A

SOURCE CONTROL DRAWING

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SIZE C
NASA DRAWING NO. 1006291
SCALE
WT
SHEET 1 OF 1

4 3 2 1

1006291 A

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1006291

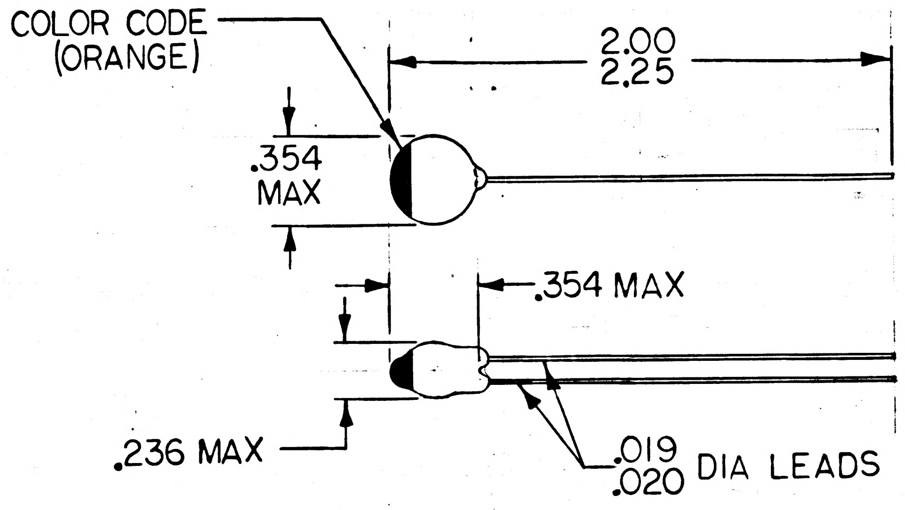
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 15260	6 Jan 65	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1 WITH THE FOLLOWING SPECIFIC REQUIREMENTS.
     - (1) MARKING: SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED EXTERNALLY AND INTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PART NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) LEADS: MUST BE SOLDERABLE.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) MAXIMUM VOLTAGE: UNITS SHALL WITHSTAND 50 VOLTS DC AT 25°C IN FREE AIR WITHOUT DAMAGE OR A PERMANENT CHANGE IN RESISTANCE VALUE.
     - (2) RESISTANCE VALUE VS TEMPERATURE: ZERO-POWER CHARACTERISTIC

TEMPERATURE °C	25	50	70
RESISTANCE OHMS	20 MIN 40 MAX	80 MAX	800 MIN



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APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
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HEAT TREATMENT
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DRAWN PM DATE 25AUG64
CHECKED A. Caggiano ASM 26 Aug 64
APPROVAL
APPROVAL Eldon C Hall 20 Nov 64
NASA APPROVAL W J Rhine 1-5-65
MIT APPROVAL 6 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, THERMAL—POS TEMP COEF

SOURCE CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006291
SCALE
WT
SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13426	10-14-64	
A	REVISED PER TDRR 13984	11-12-64	WR

1006292 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THE INDIVIDUAL INSULATED CONDUCTORS OF THESE CABLES SHALL CONFORM TO THE REQUIREMENTS OF MIL-W-16878 TYPE E.

C. SUPPLIER SHALL COMPLY WITH THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) CONSTRUCTION: WHEN VIEWED UNDER 10X MAGNIFICATION, INSULATION SHALL APPEAR AS A HOMOGENEOUS MASS WITHOUT EVIDENCE OF CRACKS, FLAWS, OR SEPARATION, BETWEEN COLORS OR ELSEWHERE.

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC WITHSTANDING VOLTAGE: SEE TABLE I.

(2) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM PER 1000 FEET OF INDIVIDUAL LEAD.

3. DESIGN:

A. OPERATION AND/OR STORAGE LIFE: INDEFINITE WITHOUT EMBRITTLEMENT OF CONDUCTORS OR PLASTIC INSULATION AT TEMPERATURES 200°C TO -55°C

B. CONSTRUCTION: A MULIPLICITY OF STRANDED COPPER CONDUCTORS ARRANGED IN A FLAT STRIP WHICH HAVE AN EXTRUDED POLYTETRAFLUOROETHYLENE (TFE) INSULATION AROUND EACH CONDUCTOR AND AN INTER-CONNECTING WEB WHICH CAN BE SLIT TO SEPARATE THE INSULATED CONDUCTORS.

C. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC CONSTANT: 2.2 MAXIMUM

(2) POWER FACTOR: 0.005 (0.5%) MAXIMUM

(3) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM

(4) WORKING VOLTAGE 600 VOLTS RMS

4. LENGTH TO BE AS SPECIFIED ON PURCHASE ORDER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
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HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 28 Aug
CHECKED Norm Adrian A&M Aug 29 64
APPROVAL
APPROVAL Eldon C Hall 9 Oct 64
NASA APPROVAL W J Rhine 10-14-64
MIT APPROVAL D Nafil 10/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, SPECIAL PURPOSE,
ELECTRICAL- FLAT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006292
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006292 A

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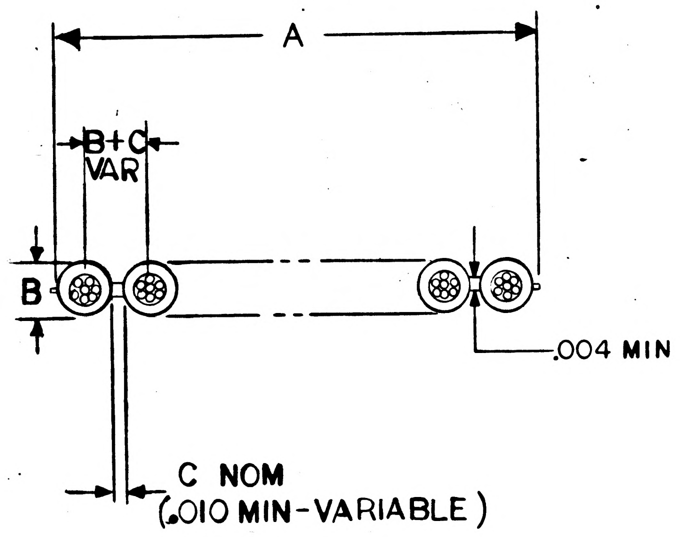
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13426	10-14-64	
A	REVISED PER TDRR 13984	11-11-64	WK

TABLE I

DASH NO.	DIMENSIONS						INSULATION		
	A ±.03	B	C NOM	COND SPACE NOM (B + C)	NO. COND	COND SIZE	VOLTAGE RATING VRMS	COLOR AND SEQUENCE/ARRANGEMENT	DIELECTRIC WITHSTANDING VOLTS VRMS MINIMUM
-001	.36	.040 .048	.015	.059	6	NO. 24	600	6 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN-BLU-VIO	2,000
-002	.59	.040 .048	.015	.059	10	NO. 24	600	10 SEQUENTIAL SOLID COLORS BLK-BRN-RED-ORN-YEL-GRN-BLU-VIO-GRY-WHT	2,000
-003	.30	.040 .048	.015	.059	5	NO. 24	600	5 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN-BLU	2,000



MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

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MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE
CHECKED Tom Adrian Aug 29, 64
APPROVAL
APPROVAL Ellen C. Hall 9 Oct 64
NASA APPROVAL W J 10-14-64
MIT APPROVAL L Hagel 10/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, SPECIAL PURPOSE,
ELECTRICAL — FLAT.
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006292
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

OTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA RE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY ELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERN- ENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; ND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR N ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS OT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER ICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEY- NG ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY ATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006292 B

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13426	10-14-64	
A	REVISED PER TDRR 13984	11-12-64	WK
B	REVISED PER TDRR 14479	12-1-64	WK

EQUIREMENTS:

. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THE INDIVIDUAL INSULATED CONDUCTORS OF THESE CABLES SHALL CONFORM TO THE REQUIREMENTS OF MIL-W-16878 TYPE E.

C. SUPPLIER SHALL COMPLY WITH THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:
   (1) DIMENSIONS: AS DELINEATED HEREIN.
   (2) CONSTRUCTION: WHEN VIEWED UNDER 10X MAGNIFICATION, INSULATION SHALL APPEAR AS A HOMOGENEOUS MASS WITHOUT EVIDENCE OF CRACKS, FLAWS, OR SEPARATION, BETWEEN COLORS OR ELSEWHERE.

B. ELECTRICAL CHARACTERISTICS:
   (1) DIELECTRIC WITHSTANDING VOLTAGE: SEE TABLE I.
   (2) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM PER 1000 FEET OF INDIVIDUAL LEAD.

DESIGN:

A. OPERATION AND/OR STORAGE LIFE: INDEFINITE WITHOUT EMBRITTLEMENT OF CONDUCTORS OR PLASTIC INSULATION AT TEMPERATURES 200°C TO -55°C

B. CONSTRUCTION: A MULIPLICITY OF STRANDED COPPER CONDUCTORS ARRANGED IN A FLAT STRIP WHICH HAVE AN EXTRUDED POLYTETRAFLUOROETHYLENE (TFE) INSULATION AROUND EACH CONDUCTOR AND AN INTER-CONNECTING WEB WHICH CAN BE SLIT TO SEPARATE THE INSULATED CONDUCTORS.

C. ELECTRICAL CHARACTERISTICS:
   (1) DIELECTRIC CONSTANT: 2.2 MAXIMUM
   (2) POWER FACTOR: 0.005 (0.5%) MAXIMUM
   (3) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM
   (4) WORKING VOLTAGE 600 VOLTS RMS

LENGTH TO BE AS SPECIFIED ON PURCHASE ORDER

CURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIN NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 28 Aug
CHECKED Norma Adrian Aug 29 64
APPROVAL
APPROVAL Eldon C Hall 9 Oct 64
NASA APPROVAL W J Rhine 10-14-64
MIT APPROVAL D Nagel 10/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, SPECIAL PURPOSE, ELECTRICAL- FLAT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006292
SCALE NONE | WT | SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

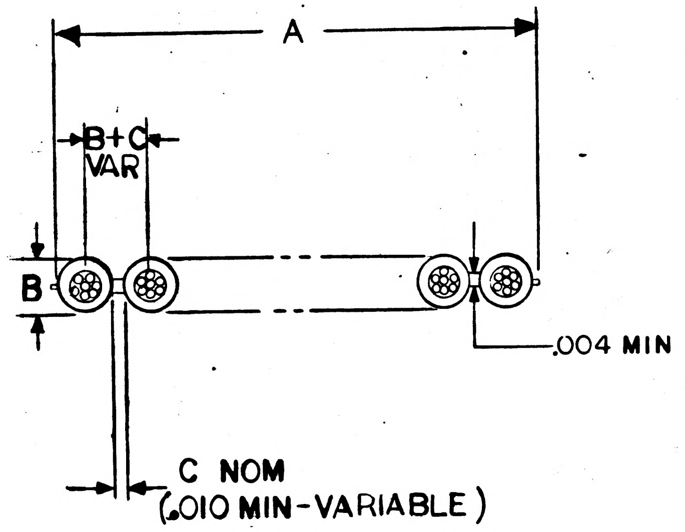
1006292 B

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13426	10-14-64	
A	REVISED PER TDRR 13984	11-12-64	WK
B	REVISED PER TDRR 14479	12-1-64	WK

TABLE I

DASH NO.	DIMENSIONS						INSULATION		
	A ±.03	B	C NOM	COND SPACE NOM (B + C)	NO. COND	COND SIZE	VOLTAGE RATING VRMS	COLOR AND SEQUENCE/ARRANGEMENT	DIELECTRIC WITHSTANDING VOLTS VRMS MINIMUM
-001	.36	.040 .048	.015	.059	6	NO. 24	600	6 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN-BLU-VIO	2,000
-002	.59	.040 .048	.015	.059	10	NO. 24	600	10 SEQUENTIAL SOLID COLORS BLK-BRN-RED-ORN-YEL-GRN-BLU-VIO-GRY-WHT	2,000
-003	.30	.040 .048	.015	.059	5	NO. 24	600	5 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN-BLU	2,000
-004	.18	.040 .048	.015	.059	3	NO. 24	600	3 SEQUENTIAL SOLID COLOR RED-ORN-YEL	2,000
-005	.24	.040 .048	.015	.059	4	NP. 24	600	4 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN	2,000



MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIN NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE
CHECKED Aug 27, 64
APPROVAL
APPROVAL Ellen C. Hall 9 Oct 64
NASA APPROVAL W J R 10-14-64
MIT APPROVAL L Hazel 10/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, SPECIAL PURPOSE,
ELECTRICAL — FLAT.
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006292
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006292 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13426	10-14-64	
A	REVISED PER TDRR 13984	11-12-64	WK
B	REVISED PER TDRR 14479	12-1-64	WK
C	REVISED PER TDRR 15735	2/2/65	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THE INDIVIDUAL INSULATED SILVER COATED CONDUCTORS OF THESE CABLES SHALL CONFORM TO THE REQUIREMENTS OF MIL-W-16878 (TYPE E) /4 EXCEPT 19 STRANDS MIN.

   C. SUPPLIER SHALL COMPLY WITH THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) CONSTRUCTION: WHEN VIEWED UNDER 10X MAGNIFICATION, INSULATION SHALL APPEAR AS A HOMOGENEOUS MASS WITHOUT EVIDENCE OF CRACKS, FLAWS, OR SEPARATION, BETWEEN COLORS OR ELSEWHERE.

      (3) TEAR STRENGTH BETWEEN ANY LENGTHWISE CONDUCTOR & ANY OTHER SHALL BE 1LB. MIN. WHETHER THE WEBBING IN NOTCHED OR UNNOTCHED

   B. ELECTRICAL CHARACTERISTICS:

      (1) DIELECTRIC WITHSTANDING VOLTAGE: SEE TABLE I.

      (2) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM PER 1000 FEET OF INDIVIDUAL LEAD.

3. DESIGN:

   A. OPERATION AND/OR STORAGE LIFE: INDEFINITE WITHOUT EMBRITTLEMENT OF CONDUCTORS OR PLASTIC INSULATION AT TEMPERATURES 200°C TO -55°C

   B. CONSTRUCTION: A MULIPLICITY OF STRANDED COPPER CONDUCTORS ARRANGED IN A FLAT STRIP WHICH HAVE AN EXTRUDED POLYTETRAFLUOROETHYLENE (TFE) INSULATION AROUND EACH CONDUCTOR AND AN INTER-CONNECTING WEB WHICH CAN BE SLIT TO SEPARATE THE INSULATED CONDUCTORS.

   C. ELECTRICAL CHARACTERISTICS:

      (1) DIELECTRIC CONSTANT: 2.2 MAXIMUM

      (2) POWER FACTOR: 0.005 (0.5%) MAXIMUM

      (3) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM

      (4) WORKING VOLTAGE 600 VOLTS RMS

4. LENGTH TO BE AS SPECIFIED ON PURCHASE ORDER

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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 28 Aug
CHECKED Aug 29 64
APPROVAL
APPROVAL Eldon C Hall 9 Oct 64
NASA APPROVAL W J Rhine 10-14-64
MIT APPROVAL 10/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, SPECIAL PURPOSE,
ELECTRICAL- FLAT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006292
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006292 C

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TABLE I

DASH NO.	DIMENSIONS						INSULATION		
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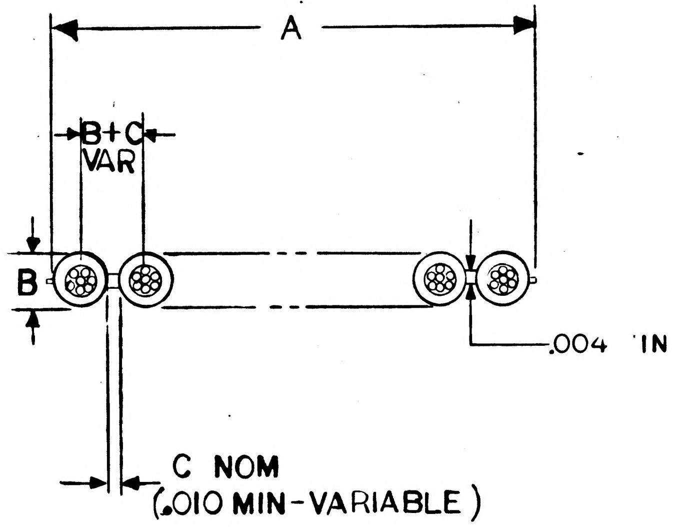
-005	.24	.040 .048	.015	.059	4	NO. 24	600	4 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN	2,000
-006	.41	.040 .048	.015	.059	7	NO. 24	600	7 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN-BLU-VIO-GRY	2,000
-007	.47	.040 .048	.015	.059	8	NO. 24	600	8 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN-BLU-VIO-GRY-WHT	2,000
-008	.53	.040 .048	.015	.059	9	NO. 24	600	9 SEQUENTIAL SOLID COLORS BRN-RED-ORN-YEL-GRN-BLU-VIO-GRY-WHT	2,000



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MIT
INSTRUMENTATION LAB
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DWG. NO. CONTRACT
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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ELECTRICAL — FLAT.
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006292
SCALE NONE
WT
SHEET 2 OF 2

MASTER

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—	1006292

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13426	10-14-64	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THE INDIVIDUAL INSULATED CONDUCTORS OF THESE CABLES SHALL CONFORM TO THE REQUIREMENTS OF MIL-W-16878 TYPE E.

C. SUPPLIER SHALL COMPLY WITH THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) CONSTRUCTION: WHEN VIEWED UNDER 10X MAGNIFICATION, INSULATION SHALL APPEAR AS A HOMOGENEOUS MASS WITHOUT EVIDENCE OF CRACKS, FLAWS, OR SEPARATION, BETWEEN COLORS OR ELSEWHERE.

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC WITHSTANDING VOLTAGE: SEE TABLE I.

(2) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM PER 1000 FEET OF INDIVIDUAL LEAD.

3. DESIGN:

A. OPERATION AND/OR STORAGE LIFE: INDEFINITE WITHOUT EMBRITTLEMENT OF CONDUCTORS OR PLASTIC INSULATION AT TEMPERATURES BELOW 200°C.

B. CONSTRUCTION: A MULIPLICITY OF STRANDED COPPER CONDUCTORS ARRANGED IN A FLAT STRIP WHICH HAVE AN EXTRUDED POLYTETRAFLUOROETHYLENE (TFE) INSULATION AROUND EACH CONDUCTOR AND AN INTER-CONNECTING WEB WHICH CAN BE SLIT TO SEPARATE THE INSULATED CONDUCTORS.

C. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC CONSTANT: 2.2 MAXIMUM

(2) POWER FACTOR: 0.005 (0.5%) MAXIMUM

(3) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM

(4) WORKING VOLTAGE 600 VOLTS RMS

4. LENGTH TO BE AS SPECIFIED ON PURCHASE ORDER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
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DRAWN DATE
CHECKED Norm Adrian A&M Aug 29 64
APPROVAL
APPROVAL Eldon C Hall 9 Oct 64
NASA APPROVAL W J Rhine 10-14-64
MIT APPROVAL D Nafil 10/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, SPECIAL PURPOSE,
ELECTRICAL- FLAT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006292
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
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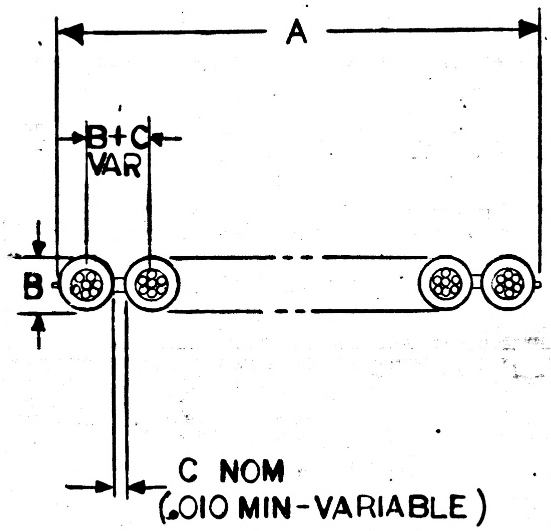
— 1006292

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13426	10-14-64	

TABLE I

DASH NO.	DIMENSIONS						INSULATION		
	A ±.03	B	C NOM	COND SPACE NOM (B + C)	NO. COND	COND SIZE	VOLTAGE RATING VRMS	COLOR AND SEQUENCE/ARRANGEMENT	DIELECTRIC WITHSTANDING VOLTS VRMS MINIMUM
-001	.36	.040 .048	.015	.059	6	NO. 24	600	6 SEQUENTIAL SOLID COLORS RED-ORN-YEL-GRN-BLU-VIO	2,000
-002	.59	.040 .048	.015	.059	10	NO. 24	600	10 SEQUENTIAL SOLID COLORS BLK-BRN-RED-ORN-YEL-GRN-BLU-VIO-GRY-WHT	2,000



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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DRAWN [illegible] DATE [illegible]
CHECKED Tom Adrian Aug 27, 64
APPROVAL
APPROVAL Eldon C. Hall 9 Oct 64
NASA APPROVAL W J Rhine 10-14-64
MIT APPROVAL L Hagel 10/14/64

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HOUSTON, TEXAS

CABLE, SPECIAL PURPOSE,
ELECTRICAL— FLAT.
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006292
SCALE NONE WT SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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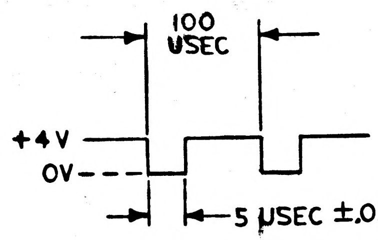
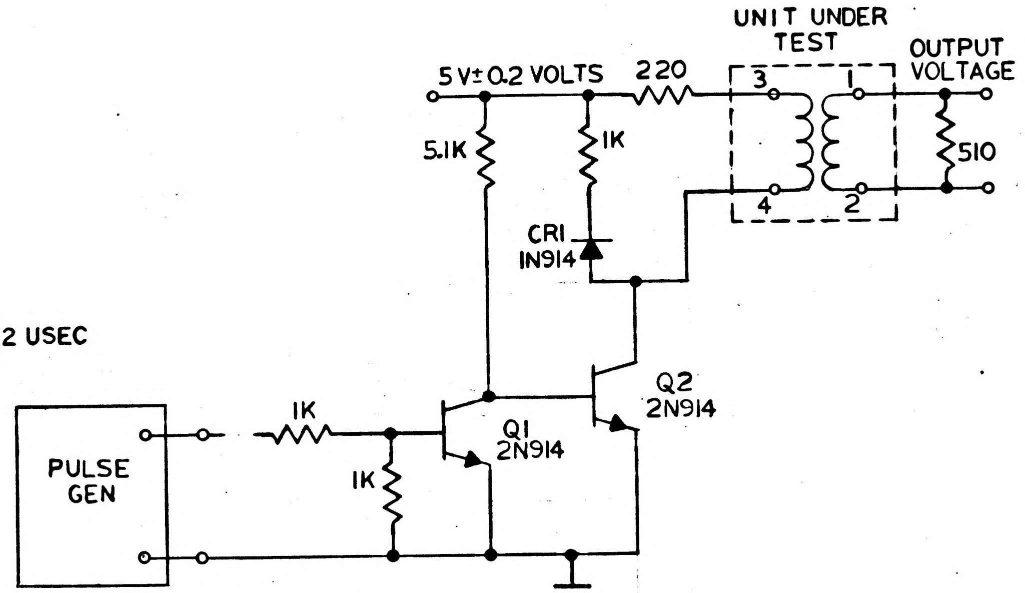
1006293 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 12806	9-22-64	WK
A	REVISED PER TDRR 18267	4/27/65	WK



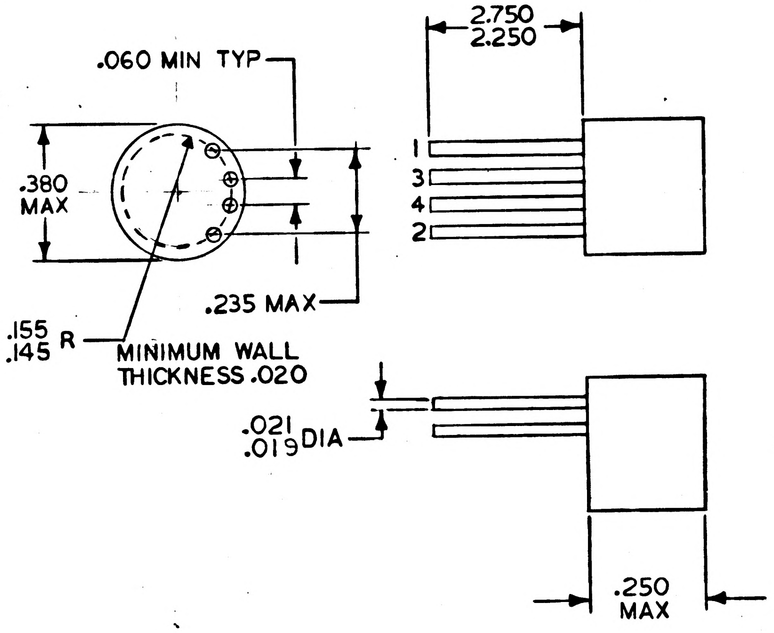
100 USEC
+4V
OV
5 USEC ±.02 USEC



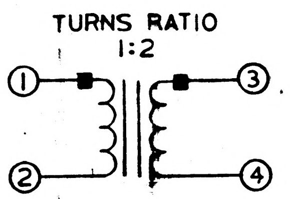
UNIT UNDER TEST
5V±0.2 VOLTS
220
OUTPUT VOLTAGE
3
1
4
2
510
5.1K
1K
CR1 1N914
Q2 2N914
Q1 2N914
1K
1K
PULSE GEN

ALL RESISTORS ±2%

FIGURE I



2.750
2.250
.060 MIN TYP
.380 MAX
1
3
4
2
.235 MAX
.155
.145 R
MINIMUM WALL THICKNESS .020
.021
.019 DIA
.250 MAX



TURNS RATIO 1:2
①
②
③
④

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APPLICATION	

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DRAWN J F Walsh DATE 1 Sept 64
CHECKED A. Martz 9-16-64
APPROVAL 9-18-64
APPROVAL Eldon C Hall 9/21/64
NASA APPROVAL W J Rhine 9-22-64
MIT APPROVAL W Kupfer 22/9/64

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HOUSTON, TEXAS

TRANSFORMER, PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006293
SCALE NONE
WT
SHEET 1 OF 2

MASTER

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1006293 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 12806	9-22-64	WK
A	REVISED PER TDRR 18267	4/27/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.

D. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN. QUALIFICATION APPROVAL NOT REQ'D.

2. INSPECTION AND ACCEPTANCE: (100% UNLESS OTHERWISE SPECIFIED)

A. MECHANICAL REQUIREMENTS:

(1) LEADS SHALL BE IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) COLOR SHALL BE RED

(3) MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DASH NO., LEAD IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER. GOTHIC DEMIBOLD STYLE IS PERMISSIBLE

B. ELECTRICAL REQUIREMENTS: APPLICABLE PARAMETERS SHALL BE MEASURED USING A BOONTON 260A Q-METER OR EQUIVALENT

(1) PRIMARY INDUCTANCE (L_P): 1.7 MH ± 20%, MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 OPEN. INPUT CAPACITANCE WILL BE ACCOUNTED FOR IN MEASUREMENT.

(2) LEAKAGE INDUCTANCE (L_L) 2.3 UH MAXIMUM, MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 SHORT CIRCUITED

(3) COUPLING CAPACITANCE (C_C): 20 UUF MAXIMUM, MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.

(4) INPUT CAPACITANCE (C_I): 8.0 UUF MAXIMUM MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 OPEN.

(5) WORKING VOLTAGE: 50 VOLTS MINIMUM AT 105°C.

(6) DC RESISTANCE:

(a) TERMINALS 1-2: 1.4 OHMS MAXIMUM.

(b) TERMINALS 3-4: 2.7 OHMS MAXIMUM.

(7) TURNS RATIO: 1 TO 2. ±3%

(8) WAVEFORM: FIGURE 1 WILL REPLACE THE TEST CIRCUIT, FIGURE 4 OF MIL-T-21038B. THE INPUT PULSE TRAIN SHALL HAVE A PULSE REPETITION RATE OF 10K CPS ± 10% AND THE PULSE WIDTH SHALL BE 5 MICROSECONDS±.02 USEC PULSE DEFINITION AND MEASUREMENTS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.12 AND 4.8.8 RESPECTIVELY OF MIL-T-21038B. THE TRANSFORMER OUTPUT SHALL MEET THE FOLLOWING SPECIFICATIONS MEASURED AT STANDARD CONDITIONS EXCEPT AS OTHERWISE SPECIFIED: THIS TEST SHALL BE PERFORMED ON A 5% SAMPLE OF EACH SHIPMENT WITH NO FAILURES ALLOWED.

(a) PULSE DURATION: 5 MICROSECONDS ±.02 USEC

(b) PEAK PULSE AMPLITUDE: 2.0 VOLTS MINIMUM.

(c) DROOP: 40% MIN. AT 5.0 MICROSECONDS 60% MAX.

(d) PULSE RISE TIME: 0.1 MICROSECOND MAXIMUM.

(e) PULSE DECAY TIME: 0.1 MICROSECOND MAXIMUM.

(f) OVER SHOOT N/A

(9) DIELECTRIC WITHSTANDING VOLTAGE AT ATMOSPHERE PRESSURE (AT 28 TO 32 INCHES OF MERCURY): IN ACCORDANCE WITH PARAGRAPH 4.8.4.1 OF MIL-T-21038B. TEST BETWEEN PIN 1 AND PIN 3.

3. DESIGN REQUIREMENTS:

A. POWER RATING: 0.3 WATT AT 25°C DERATED LINEARLY TO .05 WATT AT 105°C.

B. DIELECTRIC WITHSTANDING VOLTAGE AT REDUCE BAROMETRIC PRESSURE:

IN ACCORDANCE WITH PARAGRAPH 4.8.4.2 OF MIL-T-21038B. TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.

C. UNITS SHALL BE ENCAPSULATED.

D. WIRE SIZE: AWG 41 OR LARGER.

E. OPERATING TEMPERATURE RANGE: 20°C TO 105°C.

4. SPECIAL CONDITIONING (BY MANUFACTURER): 100%

EACH UNIT SHALL BE TEMP. CYCLED BY VENDOR PRIOR TO INSPECTION AND ACCEPTANCE. THE TEST SHALL BE FIVE (5) CYCLES, ONE (1) CYCLE CONSISTING OF THE FOLLOWING:

125°C FOR 30 MIN, 25°C FOR MAX. OF 10 MIN., MINUS 55°C FOR 30 MIN., AND 25°C FOR MAX. OF 10 MIN. DURING THE 5TH CYCLE THE UNIT SHALL BE MONITORED FOR CONTINUITY.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND1002034 FOR THIS DRAWING

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DRAWN J.F.Walsh DATE 1 Sept 64
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APPROVAL 9-18-64
APPROVAL Ellen C Hill 9/21/64
NASA APPROVAL W J Rhine 9-22-64
MIT APPROVAL 22 Sep 64

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TRANSFORMER,PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006293

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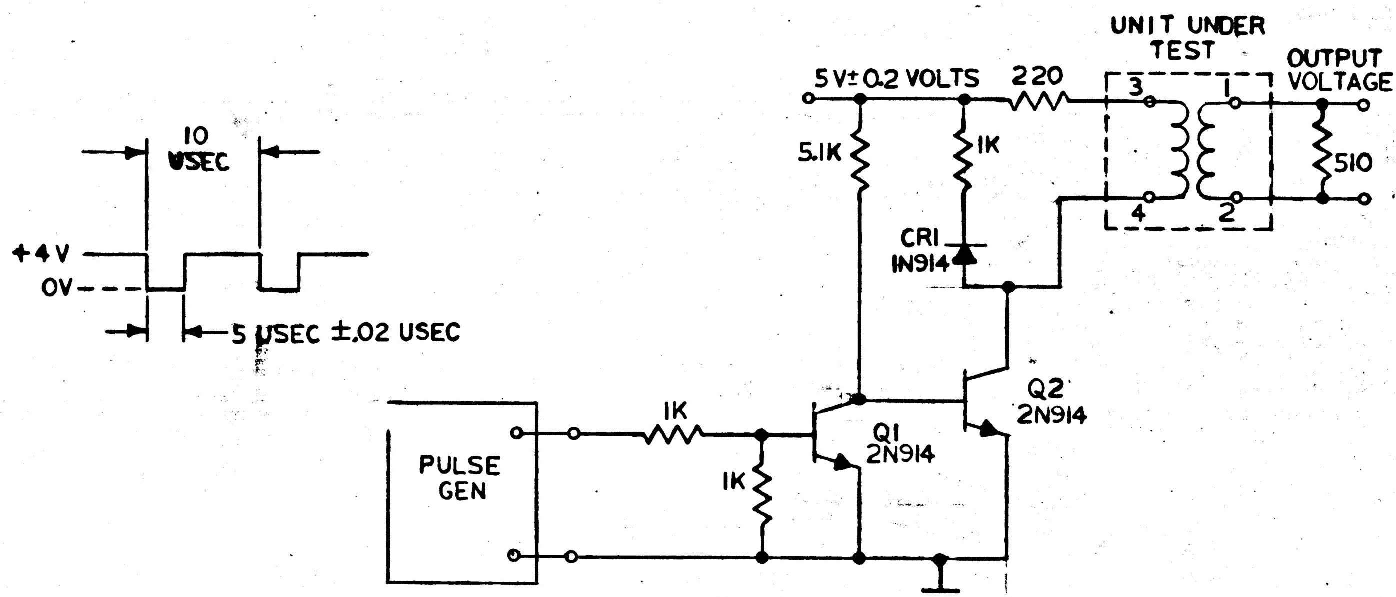
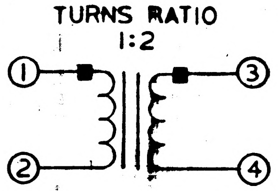
1006293 B

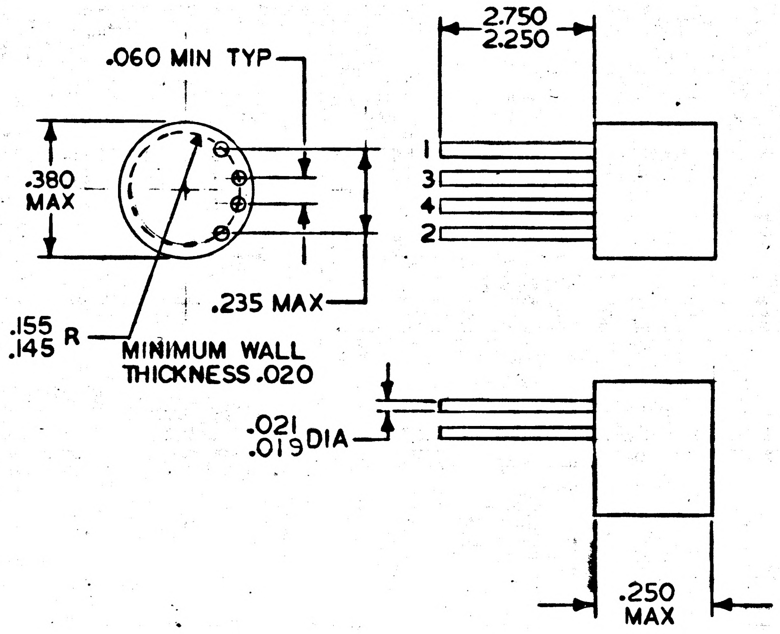
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 12806	9-22-64	WK
A	REVISED PER TDRR 18267	4/23/65	WK
B	REVISED PER TDRR 22759	10/5/65	WK


10 USEC
+4V
0V
5 USEC ±.02 USEC
5V±0.2 VOLTS
220
UNIT UNDER TEST
3
1
4
2
OUTPUT VOLTAGE
510
5.1K
1K
CR1 1N914
Q2 2N914
PULSE GEN
1K
Q1 2N914
1K

ALL RESISTORS ±2%
FIGURE I


TURNS RATIO 1:2
1
2
3
4


.060 MIN TYP
.380 MAX
.235 MAX
.155 .145 R
MINIMUM WALL THICKNESS .020
2.750 2.250
1
3
4
2
.021 .019 DIA
.250 MAX

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DRAWN J F Walsh DATE 1 Sept 64
CHECKED A. Marts 9-16-64
APPROVAL 9-18-64
APPROVAL 9/21/64
NASA APPROVAL W J Rhine 9-22-64
MIT APPROVAL W Kupfer 22/9/64

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TRANSFORMER, PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006293
SCALE NONE
WT
SHEET 1 OF 2

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1006293 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 12806	9-22-64	WK
A	REVISED PER TDRR 18267	4/12/65	WK
B	REVISED PER TDRR 22759	10/5/65	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - D. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN. QUALIFICATION APPROVAL NOT REQ'D.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND1002215 CLASS 1 CODE 1
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215

2. INSPECTION AND ACCEPTANCE: (100% UNLESS OTHERWISE SPECIFIED)
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS AND PART MARKING: AS DELINEATED HEREIN.
     - (2) LEADS SHALL BE UNCOATED ANNEALED NICKEL IN ACCORDANCE WITH ND1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) COLOR SHALL BE RED
     - (4) MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DASH NO., LEAD IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER. GOTHIC DEMIBOLD STYLE IS PERMISSIBLE
   - B. ELECTRICAL REQUIREMENTS: APPLICABLE PARAMETERS SHALL BE MEASURED USING A BOONTON 260A Q-METER OR EQUIVALENT
     - (1) PRIMARY INDUCTANCE (L_P): 1.7 MH ± 20%, MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 OPEN. INPUT CAPACITANCE WILL BE ACCOUNTED FOR IN MEASUREMENT.
     - (2) LEAKAGE INDUCTANCE (L_L) 2.3 UH MAXIMUM, MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 SHORT CIRCUITED
     - (3) COUPLING CAPACITANCE (C_C): 20. UUF MAXIMUM, MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.
     - (4) INPUT CAPACITANCE (C_I): 8.0 UUF MAXIMUM MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 OPEN.
     - (5) WORKING VOLTAGE: 50 VOLTS MINIMUM AT 105°C.
     - (6) DC RESISTANCE:
       - (a) TERMINALS 1-2: 1.4 OHMS MAXIMUM.
       - (b) TERMINALS 3-4: 2.7 OHMS MAXIMUM.
     - (7) TURNS RATIO: 1 TO 2. ±3%
     - (8) WAVEFORM: FIGURE 1 WILL REPLACE THE TEST CIRCUIT, FIGURE 4 OF MIL-T-21038B. THE INPUT PULSE TRAIN SHALL HAVE A PULSE REPETITION RATE OF 100K CPS ± 10% AND THE PULSE WIDTH SHALL BE 5 MICROSECONDS±.02 USEC PULSE DEFINITION AND MEASUREMENTS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.12 AND 4.8.8 RESPECTIVELY OF MIL-T-21038B. THE TRANSFORMER OUTPUT SHALL MEET THE FOLLOWING SPECIFICATIONS MEASURED AT STANDARD CONDITIONS EXCEPT AS OTHERWISE SPECIFIED: THIS TEST SHALL BE PERFORMED ON A 5% SAMPLE OF EACH SHIPMENT WITH NO FAILURES ALLOWED.
       - (a) PULSE DURATION: SHALL BE 5 usec ±.05 usec MEASURED FROM $.1E_1$ TO $.1E_2$
       - (b) PEAK PULSE AMPLITUDE: 2.0 VOLTS MINIMUM. (E_1)
       - (c) DROOP: 40% MIN. AT 5.0 MICROSECONDS 60% MAX.
       - (d) PULSE RISE TIME: 0.1 MICROSECOND MAXIMUM.
       - (e) PULSE DECAY TIME: 0.1 MICROSECOND MAXIMUM.
       - (f) OVER SHOOT N/A
     - (9) DIELECTRIC WITHSTANDING VOLTAGE AT ATMOSPHERE PRESSURE (AT 28 TO 32 INCHES OF MERCURY): IN ACCORDANCE WITH PARAGRAPH 4.8.4.1 OF MIL-T-21038B. TEST BETWEEN PIN 1 AND PIN 3.

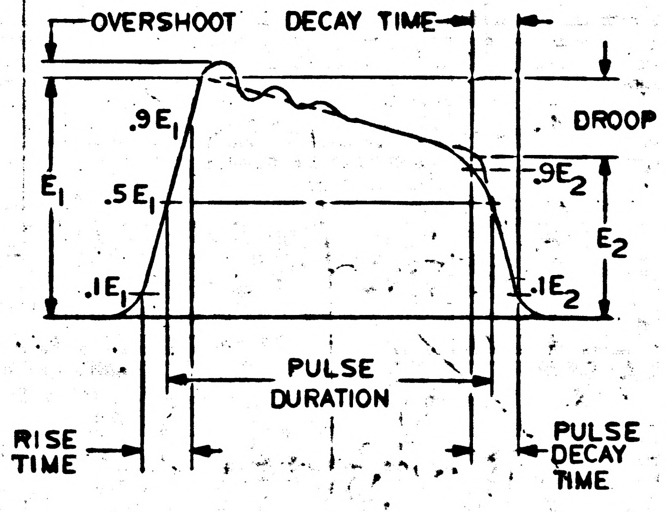
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 0.3 WATT AT 25°C DERATED LINEARLY TO .05 WATT AT 105°C.
   - B. DIELECTRIC WITHSTANDING VOLTAGE AT REDUCE BAROMETRIC PRESSURE:

     IN ACCORDANCE WITH PARAGRAPH 4.8.4.2 OF MIL-T-21038B. TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.
   - C. UNITS SHALL BE ENCAPSULATED.
   - D. WIRE SIZE: AWG 41 OR LARGER.
   - E. OPERATING TEMPERATURE RANGE: 20°C TO 105°C.

4. SPECIAL CONDITIONING (BY MANUFACTURER): 100%

   EACH UNIT SHALL BE TEMP. CYCLED BY VENDOR PRIOR TO INSPECTION AND ACCEPTANCE. THE TEST SHALL BE FIVE (5) CYCLES, ONE (1) CYCLE CONSISTING OF THE FOLLOWING:

   125°C FOR 30 MIN, 25°C FOR MAX. OF 10 MIN., MINUS 55°C FOR 30 MIN., AND 25°C FOR MAX. OF 10 MIN. DURING THE 5TH CYCLE THE UNIT SHALL BE MONITORED FOR CONTINUITY.



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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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DRAWN J. F. Walsh DATE 1 Sept 64
CHECKED A. Martz 9-16-64
APPROVAL 9-18-64
APPROVAL 9/21/64
NASA APPROVAL W. J. Rhine 9-22-64
MIT APPROVAL 22 Sep 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER,PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006293
SCALE NONE	WT	SHEET 2 OF 2

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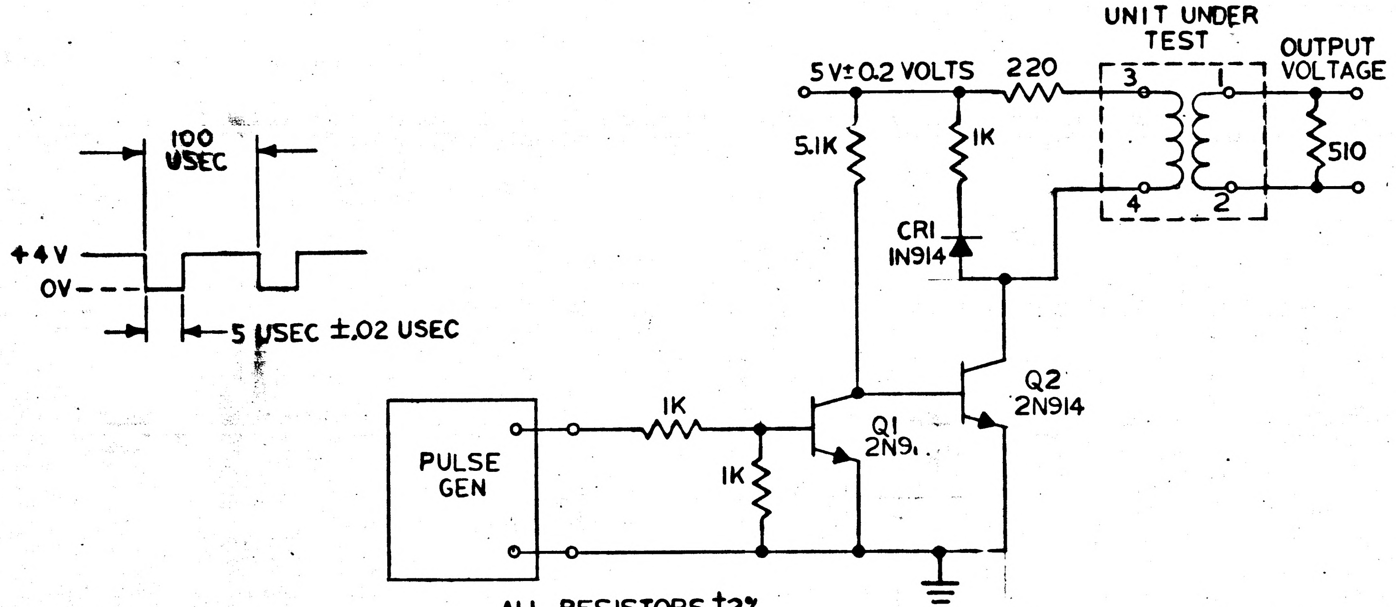
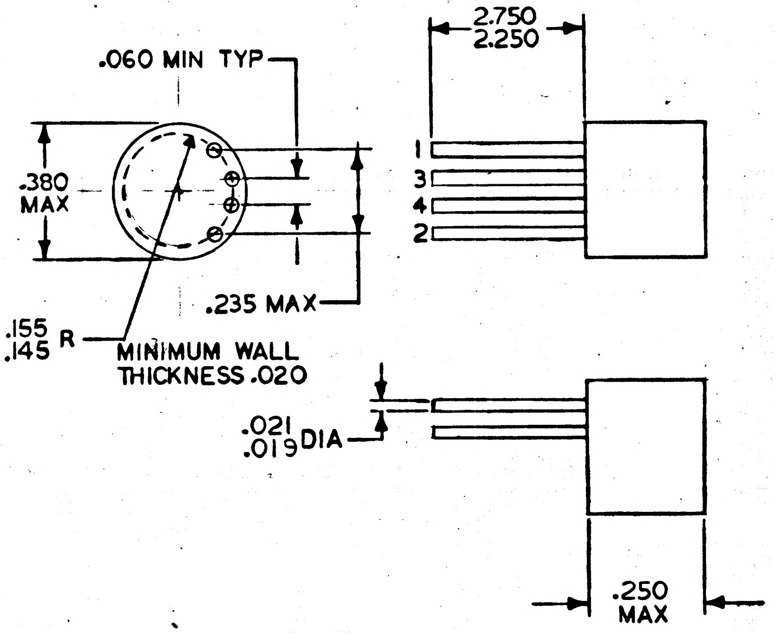
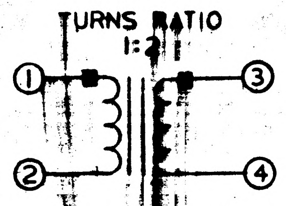
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 12806	9-22-64	


100 USEC
+4V
0V
5 USEC ±.02 USEC
5V±0.2 VOLTS
220
UNIT UNDER TEST
OUTPUT VOLTAGE
3
1
4
2
510
5.1K
1K
CR1
1N914
Q2
2N914
Q1
2N914
1K
1K
PULSE GEN

ALL RESISTORS ±2%
FIGURE 1


.060 MIN TYP
.380 MAX
.235 MAX
.155
.145 R
MINIMUM WALL THICKNESS .020
2.750
2.250
1
3
4
2
.021
.019 DIA
.250 MAX


TURNS RATIO
1:2
①
②
③
④

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J.F. Ward DATE 15 Sept 64
CHECKED A. Marto 9-16-64
APPROVAL David Shansky 9-18-64
APPROVAL Eldon C. Hall 9/21/64
NASA APPROVAL W. J. Rhine 9-22-64
MIT APPROVAL W Kupfer 22/9/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006293
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
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–	1006293

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
–	INITIAL RELEASE CLASS A PER TDRR 12806	9-22-64	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.

D. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN. QUALIFICATION APPROVAL NOT REQ'D.

2. INSPECTION AND ACCEPTANCE: (100% UNLESS OTHERWISE SPECIFIED)

A. MECHANICAL REQUIREMENTS:

(1) LEADS SHALL BE IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) COLOR SHALL BE RED

(3) MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DASH NO., LEAD IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

B. ELECTRICAL REQUIREMENTS: APPLICABLE PARAMETERS SHALL BE MEASURED USING A BOONTON 260A Q-METER OR EQUIVALENT

(1) PRIMARY INDUCTANCE (L_P): 1.7 MH ± 20%, MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 OPEN. INPUT CAPACITANCE WILL BE ACCOUNTED FOR IN MEASUREMENT.

(2) LEAKAGE INDUCTANCE (L_L) 2.3 UH MAXIMUM, MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 SHORT CIRCUITED

(3) COUPLING CAPACITANCE (C_C): 20. UUF MAXIMUM, MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.

(4) INPUT CAPACITANCE (C_I): 8.0 UUF MAXIMUM MEASURED AT TERMINALS 3-4 WITH TERMINALS 1-2 OPEN.

(5) WORKING VOLTAGE: 50 VOLTS MINIMUM AT 105°C.

(6) DC RESISTANCE:

(a) TERMINALS 1-2: 1.4 OHMS MAXIMUM.

(b) TERMINALS 3-4: 2.7 OHMS MAXIMUM.

(7) TURNS RATIO: 1 TO 2. ±3%

(8) WAVEFORM: FIGURE 1 WILL REPLACE THE TEST CIRCUIT, FIGURE 4 OF MIL-T-21038B. THE INPUT PULSE TRAIN SHALL HAVE A PULSE REPETITION RATE OF 10K CPS ± 10% AND THE PULSE WIDTH SHALL BE 5 MICROSECONDS ±.02 USEC PULSE DEFINITION AND MEASUREMENTS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.12 AND 4.8.8 RESPECTIVELY OF MIL-T-21038B. THE TRANSFORMER OUTPUT SHALL MEET THE FOLLOWING SPECIFICATIONS MEASURED AT STANDARD CONDITIONS EXCEPT AS OTHERWISE SPECIFIED: THIS TEST SHALL BE PERFORMED ON A 5% SAMPLE OF EACH SHIPMENT WITH NO FAILURES ALLOWED.

(a) PULSE DURATION: 5 MICROSECONDS ±.02 USEC

(b) PEAK PULSE AMPLITUDE: 2.0 VOLTS MINIMUM.

(c) DROOP: 40% MIN. AT 5.0 MICROSECONDS 60% MAX.

(d) PULSE RISE TIME: 0.1 MICROSECOND MAXIMUM.

(e) PULSE DECAY TIME: 0.1 MICROSECOND MAXIMUM.

(f) OVER SHOOT N/A

(9) DIELECTRIC WITHSTANDING VOLTAGE AT ATMOSPHERE PRESSURE (AT 28 TO 32 INCHES OF MERCURY): IN ACCORDANCE WITH PARAGRAPH 4.8.4.1 OF MIL-T-21038B. TEST BETWEEN PIN 1 AND PIN 3.

3. DESIGN REQUIREMENTS:

A. POWER RATING: 0.3 WATT AT 25°C DERATED LINEARLY TO .05 WATT AT 105°C.

B. DIELECTRIC WITHSTANDING VOLTAGE AT REDUCE BAROMETRIC PRESSURE:

IN ACCORDANCE WITH PARAGRAPH 4.8.4.2 OF MIL-T-21038B. TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.

C. UNITS SHALL BE ENCAPSULATED.

D. WIRE SIZE: AWG 41 OR LARGER.

E. OPERATING TEMPERATURE RANGE: 20°C TO 105°C.

4. SPECIAL CONDITIONING (BY MANUFACTURER): 100%

TRANSFORMER SHALL BE TEMPERATURE CYCLED FOR 5 CYCLES PER MIL-STD-202 METHOD 102 EXCEPT THAT THE TEMPERATURES SHALL BE -55°C +25°C AND +105°C AND EXPOSURE TIME SHALL BE 15 MINUTES AT EACH TEMPERATURE. DURING THE LAST CYCLE THE UNIT SHALL BE TESTED FOR CONTINUITY AT EACH OF THE AMBIENT CONDITIONS. AFTER STABILIZATION AT ROOM TEMPERATURE UNIT SHALL PASS NORMAL INSPECTION TESTS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND1002034 FOR THIS DRAWING

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
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FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J F Welch DATE 1 Sept 64
CHECKED A. Marts 9-16-64
APPROVAL 9-18-64
APPROVAL Ellen C Hill 9/21/64
NASA APPROVAL W J Rhine 9-22-64
MIT APPROVAL 22 1964

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER,PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006293

SCALE NONE WT SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE (REF)

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—	1006295

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13250	10-6-64	W/

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION AND NUMBER, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE, EXPIRATION DATE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). A SUITABLE TOXICITY WARNING SHALL ALSO BE MARKED.

2. ACCEPTANCE AND INSPECTION:

   A. CONSISTENCY: PASTE-LIKE [55,000 CPS (ABSOLUTE) MAXIMUM PER ASTM D1824-61T]

   B. SPECIFIC GRAVITY: 1.54-1.64 (25°/25°C) PER ASTM D1475-60.

   C. FILLER CONTENT: 55%-60% (IGNITION)

   D. COLOR: SEE TABULATION

3. DESIGN:

   A. STORAGE LIFE: 6 MONTHS MINIMUM WHEN STORED IN CLOSED CONTAINERS AT TEMPERATURE BELOW 80°F.

   B. MATERIAL: EPOXY RESIN WITH INERT FILLERS AND SUITABLE COLORING AGENTS.

   C. THIS MATERIAL SHALL BE CAPABLE OF COMPLETE CURE WHEN USED WITH CURING AGENT 1006294 IN ACCORDANCE WITH PROCESS SPECIFICATION ND 1002235.

DASH NUMBER	COLOR
-001	BLACK
-002	RED
-003	GREEN
-004	YELLOW
-005	BLUE
-006	WHITE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN DATE 28Aug64
CHECKED aug 28, 64
APPROVAL
APPROVAL Eldon C Hall 10/5/64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

EPOXY RESIN,
PASTE, PIGMENTED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006295
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006296 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 14597	12-1-64	WK
A	REVISED PER TDRR 16049	2/9/65	WK

REQUIREMENTS:

1. GENERAL

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3950 AND MS 24524, EXCEPT AS OTHERWISE SPECIFIED ~~HEREIN~~ HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055 (FOR TOGGLE REQUIREMENTS AS WELL) UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENT SECTION OF THIS DRAWING.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) CERTIFICATION: A CERTIFICATION OF COMPLIANCE WITH MATERIAL AND FINISH DESIGN REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

(3) MARKING:

(a) PIECEMARKING: PARTS (ASSEMBLIES) SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER) AND THE MANUFACTURER'S LOT CODE OR SERIAL NUMBER. TERMINAL IDENTIFICATION SHALL BE PERMANENTLY AND LEGIBLY MARKED ON THE PARTS.

(b) PACKAGES: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING (SHIPPING CONTAINERS) SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER.

(c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PARTS OR PACKAGES.

(4) SEALING (100% INSPECTION): UNITS SHALL MEET THE REQUIREMENTS OF MIL-STD-202C, METHOD112, TEST CONDITION A OR AS A SUBSTITUTE MIL-STD-810 METHOD 512 PROCEDURE I.

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC WITHSTANDING VOLTAGE (BETWEEN ANY TERMINAL AND GROUND OR MOUNTING BUSHING AND/OR BAT HANDLE AND BETWEEN ANY TWO OPEN TERMINALS):

SEA LEVEL: 1000 VRMS, 60 CPS

70,000 FT SIMULATED ALTITUDE: 350 VRMS, 60 CPS (MIL-STD-202 , METHOD 301).

(2) INSULATION RESISTANCE (100%): 1000 MEGOHMS MINIMUM AT 100 VDC. (MIL-STD-202 , METHOD 302 WITH SAME POINTS OF APPLICATION AS WITHSTANDING VOLTAGE TEST ABOVE).

(3) CONTACT RESISTANCE (100%): ONE MILLIVOLT DROP MAXIMUM AT 100 MILLIAMPERES (INITIAL).

3. DESIGN:

A. OPERATING LIFE: 20,000 CYCLES MINIMUM WHEN TESTED PER ND 1002055. WHEN LOADED PER THE REQUIREMENTS OF MS24524, AND OPERATED AT BETWEEN 10 AND 12 CYCLES PER MINUTE AT AN AMBIENT TEMPERATURE OF +121°C.

(1) HARDWARE: CORROSION RESISTING STEEL OR METALS SUITABLY PROTECTED AGAINST CORROSION. NO CADMIUM OR ZINC PLATING

(2) HANDLE: SHALL WITHSTAND 25 POUND TIP LOADING IN ALL PLANES WHILE OPERATING.

(3) BODY: DIALLYL PHTHALATE PER MIL-M-14, TYPE SDG-F

(4) CONTACT RESISTANCE: AFTER LIFE TEST, .060 OHMS MAXIMUM WHEN LOADED PER MS24524 (20AMPS RESISTIVE @ 30VDC, OR 15 AMPS INDUCTIVE @ 30VDC.)

(5) TERMINAL SCREWS SHALL WITHSTAND 6 LB-IN TORQUE LOAD.

C. ENVIRONMENTAL:

(1) OPERATING TEMPERATURE RANGE: MINUS 55°C TO PLUS 121°C

(2) MOMENTARY CONTACT OPENING WHEN TESTED TO SHOCK AND VIBRATION PER ND 1002055 SHALL NOT EXCEED 10 MICROSECOND: EXCEPT PEAK VIBRATION SHALL NOT EXCEED ± 15 G'S, AND SHOCK SHALL BE PER LIMITS OF MIL-S-3950.

(3) SHOCK TEST (NON-OPERATING) SHALL BE 78 G, HALF-SINE, 11 MSEC PULSE. NO PARTS SHALL BREAK LOOSE FROM SWITCH ASSEMBLY, AND ASSEMBLY SHALL BE RETAINED IN ITS MOUNTED POSITION. DEFORMATION OF SWITCH ASSEMBLY AND FAILURE TO OPERATE AFTER TEST ARE ALLOWABLE.

D. ELECTRICAL RATINGS:

(1) CONTACT RATINGS: SEE TABLE I.

TABLE I

DASH NO.	CONTACT RATING					
	CURRENT CAPACITY (AMPERES PER POLE) 28 VOLTS DC			CURRENT CAPACITY (AMPERES) 115 VOLTS, 60 & 400 CPS AC		
	LAMP-LOAD CIRCUIT	RESISTIVE CIRCUIT	INDUCTIVE CIRCUIT	LAMP-LOAD CIRCUIT	RESISTIVE CIRCUIT	INDUCTIVE CIRCUIT
-001	7	20	15	4	15	15

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
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DWG. NO. CONTRACT
DRAWN DATE
CHECKED F Wal Kenny 23 Nov 64
APPROVAL
APPROVAL Eldon C Hall 30 Nov 64
NASA APPROVAL W J Rhine 12-1-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE, DPST

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006296
SCALE WT SHEET 1 OF 2

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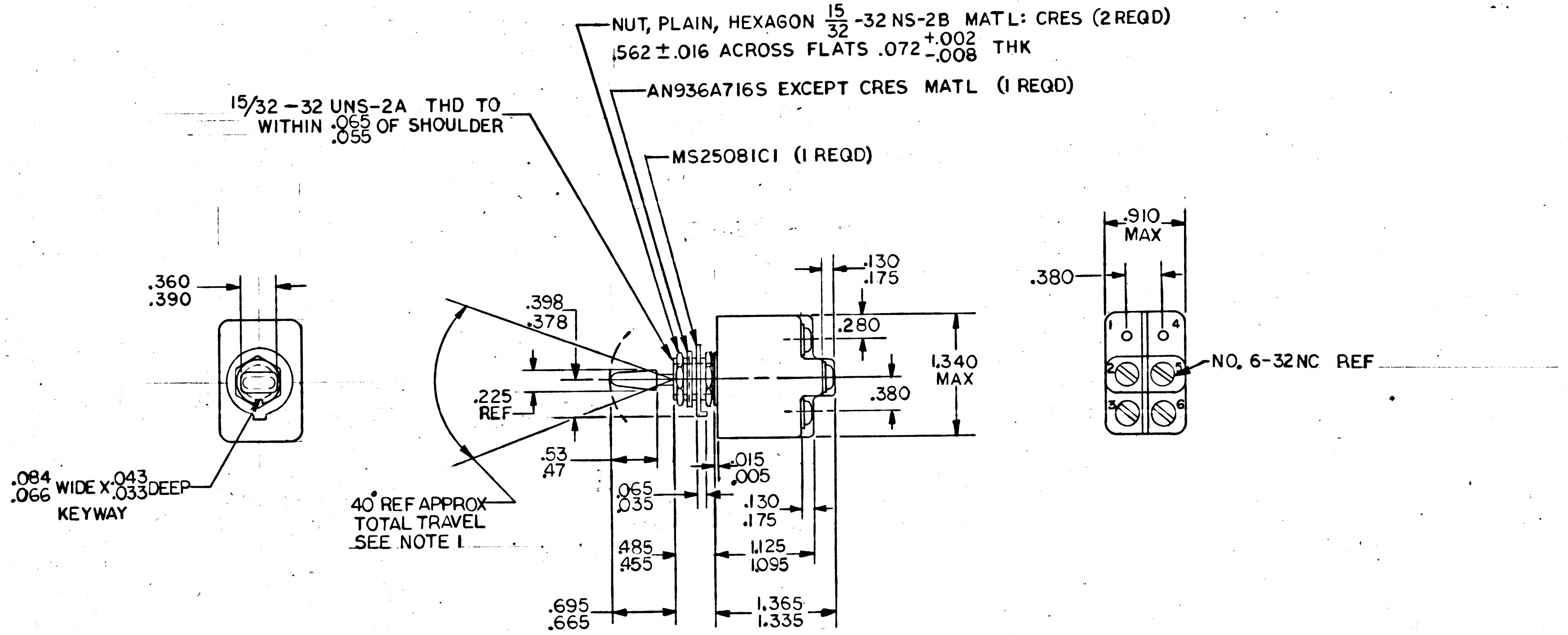
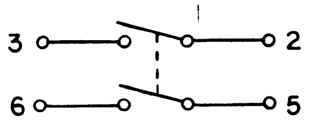
REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
	—	INITIAL RELEASE CLASS A PER TDRR 14597			12-1-64	WK
A		REVISED PER TDRR 16049			2/8/65	WK


NUT, PLAIN, HEXAGON $\frac{15}{32}$-32 NS-2B MATL: CRES (2 REQD)
.562 ± .016 ACROSS FLATS .072 $^{+.002}_{-.008}$ THK
AN936A716S EXCEPT CRES MATL (1 REQD)
MS25081C1 (1 REQD)
15/32 -32 UNS-2A THD TO WITHIN .065/.055 OF SHOULDER
.360
.390
.084/.066 WIDE X .043/.033 DEEP KEYWAY
.398
.378
.225 REF
.53
.47
40° REF APPROX TOTAL TRAVEL SEE NOTE 1
.065
.035
.485
.455
.695
.665
.015
.005
.130
.175
1.125
1.095
1.365
1.335
.130
.175
.280
.380
1.340 MAX
.910 MAX
.380
1
4
2
5
3
6
NO. 6-32NC REF



SCHEMATIC
FOR REFERENCE ONLY

NOTES
1. SWITCH DESIGNATIONS: ON-UPWARD POSITION
OFF-DOWNWARD POSITION (KEYWAY SIDE)

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN [illegible] 29 Sept 64
CHECKED A. Mart 11-24-64
APPROVED
APPROVED Eldon C Hall 11 Nov 64
APPROVED MIT W Kupfer 1 Dec 64
APPROVED MSC W J Rhine 12-1-64
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE, DPST

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
DRAWING NO. 1006296
SCALE 1/1
SHEET 2 OF 2

MASTER

—	1006296

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 14597	12-1-64	WK

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C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055 (FOR TOGGLE REQUIREMENTS AS WELL) UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENT SECTION OF THIS DRAWING.

ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) CERTIFICATION: A CERTIFICATION OF COMPLIANCE WITH MATERIAL AND FINISH DESIGN REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

(3) MARKING:

(a) PIECEMARKING: PARTS (ASSEMBLIES) SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER) AND THE MANUFACTURER'S LOT CODE OR SERIAL NUMBER. TERMINAL IDENTIFICATION SHALL BE PERMANENTLY AND LEGIBLY MARKED ON THE PARTS.

(b) PACKAGES: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING (SHIPPING CONTAINERS) SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER.

(c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PARTS OR PACKAGES.

(4) SEALING (100% INSPECTION): UNITS SHALL MEET THE REQUIREMENTS OF MIL-STD-202C, METHOD112, TEST CONDITION A

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC WITHSTANDING VOLTAGE (BETWEEN ANY TERMINAL AND GROUND OR MOUNTING BUSHING AND/OR BAT HANDLE AND BETWEEN ANY TWO OPEN TERMINALS):

SEA LEVEL: 1000 VRMS, 60 CPS

70,000 FT SIMULATED ALTITUDE: 350 VRMS, 60 CPS (MIL-STD-202 , METHOD 301).

(2) INSULATION RESISTANCE (100%): 1000 MEGOHMS MINIMUM AT 100 VDC. (MIL-STD-202 , METHOD 302 WITH SAME POINTS OF APPLICATION AS WITHSTANDING VOLTAGE TEST ABOVE).

(3) CONTACT RESISTANCE (100%): ONE MILLIVOLT DROP MAXIMUM AT 100 MILLIAMPERES (INITIAL)

3. DESIGN:

A. OPERATING LIFE: 25,000 CYCLES MINIMUM WHEN TESTED PER ND 1002055. WHEN LOADED PER THE REQUIREMENTS OF MS24524, AND OPERATED AT BETWEEN 10 AND 20 CYCLES PER MINUTE AT AN AMBIENT TEMPERATURE OF +121°C.

(1) HARDWARE: CORROSION RESISTING STEEL OR METALS SUITABLY PROTECTED AGAINST CORROSION. NO CADMIUM OR ZINC PLATING

(2) HANDLE: SHALL WITHSTAND 25 POUND TIP LOADING IN ALL PLANES WHILE OPERATING.

(3) BODY: DIALLYL PHTHALATE PER MIL-M-14, TYPE SDG-F

(4) CONTACT RESISTANCE: AFTER LIFE TEST, .060 OHMS MAXIMUM WHEN LOADED PER MS24524 (20AMPS RESISTIVE @ 30VDC, OR 15 AMPS INDUCTIVE @ 30VDC.)

C. ENVIRONMENTAL:

(1) OPERATING TEMPERATURE RANGE: MINUS 55°C TO PLUS 121°C

(2) MOMENTARY CONTACT OPENING WHEN TESTED TO SHOCK AND VIBRATION PER ND 1002055 SHALL NOT EXCEED 10 MICROSECONDS.

D. ELECTRICAL RATINGS:

(1) CONTACT RATINGS: SEE TABLE I.

TABLE I

DASH NO.	CONTACT RATINGS					
	CURRENT CAPACITY (AMPERES PER POLE) 28 VOLTS DC			CURRENT CAPACITY (AMPERES) 115 VOLTS, 60 & 400 CPS AC		
	LAMP-LOAD CIRCUIT	RESISTIVE CIRCUIT	INDUCTIVE CIRCUIT	LAMP-LOAD CIRCUIT	RESISTIVE CIRCUIT	INDUCTIVE CIRCUIT
-001	7	20	15	4	15	15

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
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CONTRACT
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APPROVAL
APPROVAL Eldon C Hall 30 Nov 64
NASA APPROVAL W J Rhine 12-1-64
MIT APPROVAL

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SWITCH, TOGGLE, DPST

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006296
SCALE	WT	SHEET 1 OF 2

INCHES
0 1 2
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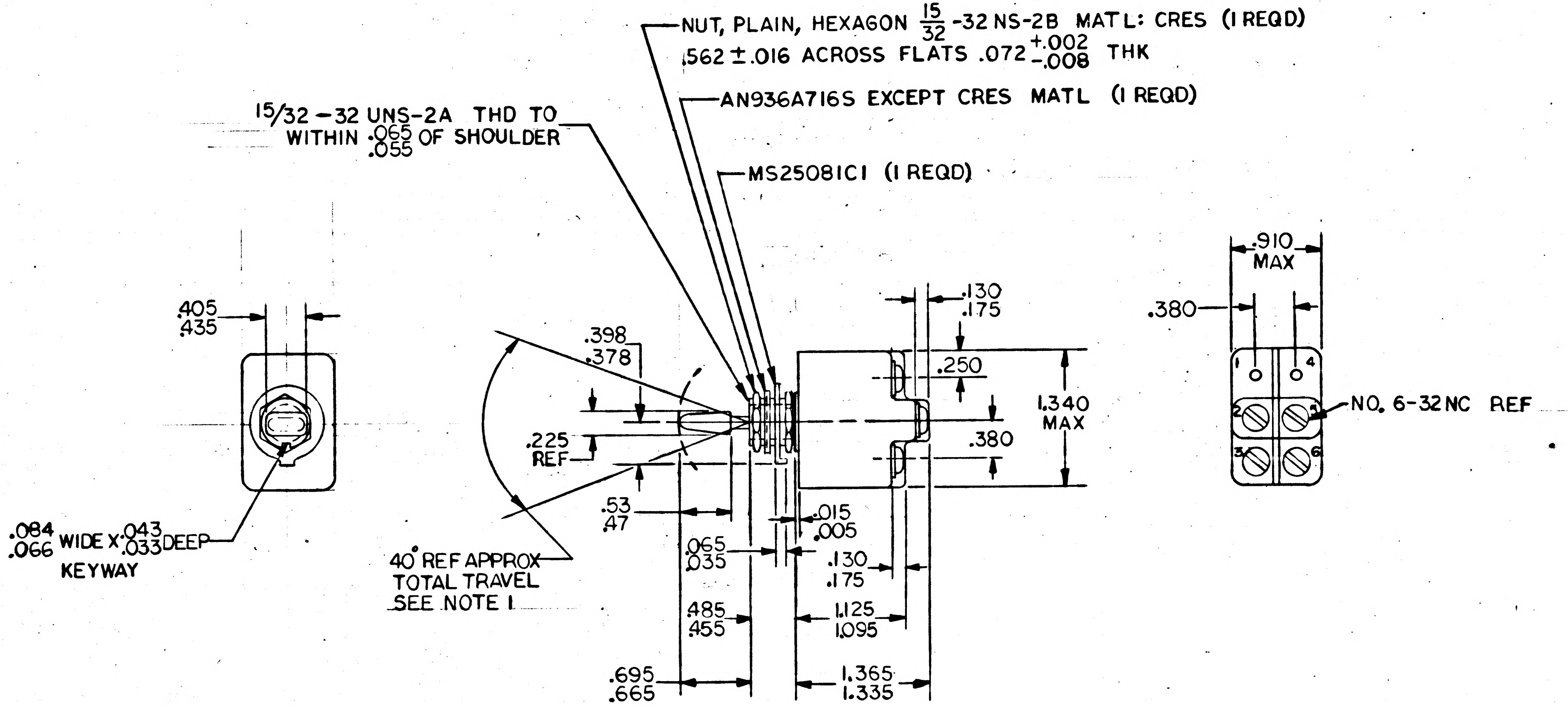
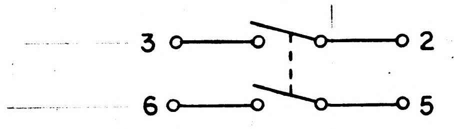
REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
	—	INITIAL RELEASE CLASS A PER TDRR 14597			12-1-64	WK


NUT, PLAIN, HEXAGON 15/32 -32 NS-2B MATL: CRES (1 REQD)
.562 ± .016 ACROSS FLATS .072 +.002 -.008 THK
AN936A716S EXCEPT CRES MATL (1 REQD)
15/32 -32 UNS-2A THD TO WITHIN .065 .055 OF SHOULDER
MS25081C1 (1 REQD)
.405 .435
.084 .066 WIDE X .043 .033 DEEP KEYWAY
.398 .378
.225 REF
.53 .47
40° REF APPROX TOTAL TRAVEL SEE NOTE 1
.065 .035
.485 .455
.695 .665
.015 .005
.130 .175
1.125 1.095
1.365 1.335
.130 .175
.250
.380
1.340 MAX
.910 MAX
.380
1
4
2
5
3
6
NO. 6-32NC REF



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FOR REFERENCE ONLY

NOTES
1. SWITCH DESIGNATIONS: ON-UPWARD POSITION
OFF-DOWNWARD POSITION (KEYWAY SIDE)

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LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

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CAMBRIDGE, MASS.

DRAWN	F. Pulini	21 Sep 64
CHECKED	A. Marto	11-24-64
APPROVED		
APPROVED	Ellen C Hall	11 Nov 64
APPROVED MIT	W Kupfer	1 Dec 64
APPROVED MSC	W J Rhine	12-1-64
		DATE

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SWITCH, TOGGLE, DPST

SPECIFICATION CONTROL DRAWING

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	C	1006296

SCALE 1/1 SHEET 2 OF 2

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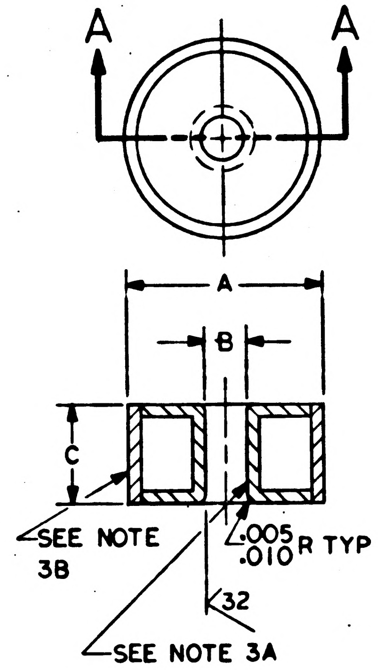
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS
     - (1) PAINT THICKNESS TO BE UNIFORM FROM .002 - .005 ALL SURFACES
     - (2) CORES SHALL BE ADEQUATELY SEALED TO WITHSTAND THE FOLLOWING TEST:
       - (a) SUBMERGE THE CORES TO A DEPTH OF TWO(2) INCHES MAXIMUM IN A MIXTURE OF 1/2 GLYCERINE AND 1/2 ETHYLENE GLYCOL. APPLY A VACUUM SUCH THAT A COLUMN OF MERCURY WOULD DROP TWENTY-FIVE(25) INCHES FROM SEA LEVEL PRESSURE FOR A PERIOD OF TWO(2) MINUTES MINIMUM.
       - (b) ANY UNIT THAT EXHIBITS BUBBLES SHALL BE REJECTED.
       - (c) UPON COMPLETION OF THIS TEST, THOROUGHLY WASH THE CORES IN RUNNING WATER, ALLOW TO DRY AND PERFORM A COMPLETE ELECTRICAL INSPECTION.
       - (d) THE VENDOR SHALL SUBMIT CERTIFICATE OF COMPLIANCE THAT CORES SUPPLIED HAVE PASSED THIS TEST.
     - (3) MARKING - PACKING SLIPS AND EXTERNAL OR INTERNAL CONTAINERS SHALL BE MARKED WITH THE MANUFACTURERS NAME, PART NUMBER, AND NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - B. ELECTRICAL REQUIREMENTS (100%)
     - (1) TESTING SHALL BE PERFORMED AS OUTLINED ON SHEET 2.
     - (2) PARAMETERS SHALL BE IN ACCORDANCE WITH TABLE I.
3. DESIGN REQUIREMENTS:
   - A. BOBBIN MATERIAL SHALL BE 303 SST PER QQ-S-763B, PART SHALL BE FREE FROM BURRS
   - B. JACKET MATERIAL SHALL BE .001 THICK PHENOLIC SLEEVE
   - C. CORES SHALL BE FABRICATED FROM 1/8 MIL MO-PERM RIBBON WOUND ON AUSTENITIC STAINLESS STEEL.



NASA DRAWING NUMBER	DIM A	DIM B	DIM C	CHARACTERISTICS
1006298-1	.249 .240	.140 MIN.	.105 .090	TABLE I
1006298-2	.187 .174	.100 MIN	.065 MAX	TABLE II

TABLE I
26 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	T_p u SEC	T_S u SEC	V_1 MV	V_0 MV
200 MA / u SEC	2.5 ± 5%	1.5 MIN 2.1 MAX	215 MIN 290 MAX	——
400 MA / u SEC	1.4 MIN 1.6 MAX	1.3 MIN 1.5 MAX	325 MIN 430 MAX	——
1000 MA / u SEC	——	——	—	15 MAX

TABLE II
11 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	T_p u SEC	T_S u SEC	V_1 MV	V_0 MV
200 MA / u SEC	2.2 ± 5%	1.5 MIN 2.1 MAX	100 MIN 130 MAX	——
400 MA / u SEC	1.3 ± 5%	1.0 MIN 1.4 MAX	145 MIN 190 MAX	——
1000 MA / u SEC	——	——	——	9 MAX

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LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
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APPROVAL Eldon C Hall 6 Oct 64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL [illegible] 6 Oct 64

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CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006298
SCALE NONE
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SHEET 1 OF 3

1006298

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4. TEST REQUIREMENTS:

INSPECTION AND/OR TEST

A. TEST EQUIPMENT: CORES ARE TO BE TESTED IN AN EQUIPMENT WHICH PERMITS APPLICATION OF A "SET" PULSE OF SUFFICIENT AMPLITUDE AND DURATION TO SATURATE THE CORE UNDER TEST, FOLLOWED BY A LINEAR (APPROX) RAMP WHOSE SLOPE MAY BE MEASURED.

B. CALIBRATION OF TEST EQUIPMENT: STANDARD CORES FURNISHED BY MIT ARE TO FORM THE BASIS OF THIS SPECIFICATION AND ARE TO BE USED FOR THE PURPOSE OF CALIBRATING THE TEST EQUIPMENT.

C. CALIBRATION PROCEDURE: EQUIPMENT SHALL BE CONNECTED TO A WELL-REGULATED LINE SUPPLY AND ALLOWED TO STABILIZE FOR ONE HOUR BEFORE MEASUREMENTS ARE MADE.

1) CALIBRATE SWEEP OF TEKTRONIX 530-340 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

2) USING TYPE D HIGH-GAIN DIFFERENCE AMPLIFTER PLUG-IN, CALIBRATE VERTICAL AMPLIFIER WITH A CALIBRATOR WHICH PERMITS THE APPLICATION OF A KNOWN (±1%) VOLTAGE TO THE VERTICAL AMPLIFIER. THE INTERNAL CALIBRATOR OF THE OSCILLOSCOPE MAY BE USED PROVIDING ITS ACCURACY HAS BEEN VERIFIED.

3) ADJUST THE AMPLITUDE AND DURATION OF THE SET PULSE SO THAT THEY ARE RESPECTIVELY AT LEAST 1/2 AMPERE AND 10 uSEC.

4) ADJUST THE SLOPE OF THE RAMP SO THAT IT INITIALLY APPROXIMATES 200 ma/uSEC. USING ONE OF THE MIT-FURNISHED STANDARD CORES, ADJUST RAMP SLOPE SO THAT MEASUREMENTS OF TIME TO PEAK, SWITCHING TIME, AND AMPLITUDE CORRESPOND TO THE DATA FURNISHED WITH THE CORES FOR THIS PARTICULAR RAMP SLOPE.

5) MEASURE "1" SWITCHING WAVE FORM.

6) READJUST RAMP SLOPE SO THAT IT APPROXIMATES 400 ma/uSEC. USING THE MIT-STANDARD CORE, ADJUST RAMP SLOPE SO THAT THE MEASUREMENTS OF SWITCHING TIME, TIME TO PEAK, AND AMPLITUDE CORRESPOND TO THE DATA FURNISHED WITH THE CORE FOR THIS PARTICULAR RAMP SLOPE.

7) MEASURE "1" SWITCHING WAVE FORM V_2.

8) READJUST RAMP SLOPE SO THAT IT APPROXIMATES 1000 ma/uSEC. DISCONNECT SET PULSE. USING MIT-STANDARD CORE, ADJUST RAMP SLOPE SO THAT THE MEASUREMENTS OF PEAK "ZERO" OUTPUT VOLTAGE IS OBTAINED. USE INTEGRATING CIRCUIT, SHOWN IN FIGURE 1, WHEN PERFORMING THIS MEASUREMENT.

9) MEASURE "ZERO" OUTPUT V_0 ON CORES, USING INTEGRATION CIRCUIT.

10) REPEAT CALIBRATION PROCEDURE AFTER TESTING EACH 100 CORES OR AFTER 8 OPERATION HOURS, WHICHEVER IS SOONER.

D. DEFINITIONS:

1) TIME TO PEAK SHALL BE MEASURED FROM THE START OF THE RAMP TO THE PEAK OF THE OUTPUT VOLTAGE WAVEFORM. THE START OF THE RAMP MAY BE FOUND BY EXTENDING THE RAMP BACK UNTIL IT CROSSES THE "ZERO CURRENT " AXIS.

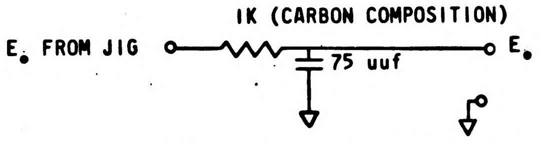

FIGURE 2. INTEGRATING CIRCUIT

THE VOLTAGE INDUCED BY THE TESTING JIG MUST BE TAKEN INTO ACCOUNT WHEN MEASURING V_0. A TYPICAL CASE IS SHOWN IN FIGURE 3. PEAK V_0 IS DEFINED AS THE MAXIMUM OF $V_{"ZERO"} - V_{JIG}$.

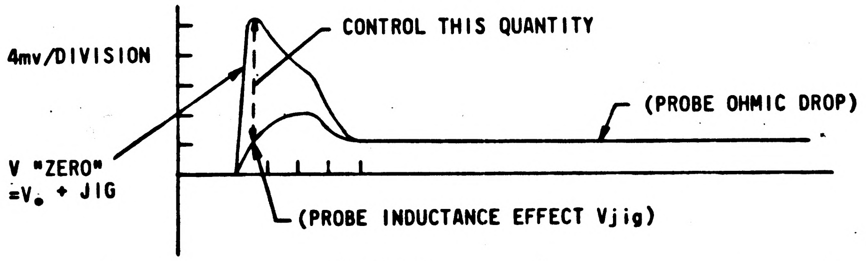

FIGURE 3

TYPICAL OUTPUT VOLTAGES, AFTER INTEGRATION, DUE TO JIG INDUCTANCE AND RESISTANCE; COMBINED JIG AND "ZERO" OUTPUTS: CURRENT SLOPE = 1000 mA/uSEC.

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LIST OF MATERIALS			

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CHECKED 5 Oct 63
APPROVAL
APPROVAL Ellen C Hull 6 Oct 64
NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL 6 Oct 64

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CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

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	C	1006298
SCALE NONE	WT	SHEET 2 OF 3

INCHES
0 1 2
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DEFINITIONS: (CONT.)

2) SWITCHING TIME SHALL BE MEASURED FROM 10% OF THE OUTPUT WAVEFORM TO 10% OF SAME WAVEFORM.

3) PEAK AMPLITUDE SHALL BE MEASURED FROM ZERO VOLTS TO THE PEAK OF THE OUTPUT WAVEFORM.

4) FOR MEASUREMENTS OF "ZERO" OUTPUT, THE INTEGRATING CIRCUIT SHOWN BELOW SHALL BE USED.

E. LIMITS - (SEE FIGURE 1)

1) TIME TO PEAK (T_p) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±5% OF THE STANDARD CORE OUTPUT FOR BOTH RAMP SLOPES.

2) SWITCHING TIME (T_s) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±10% OF THE STANDARD CORE FOR BOTH RAMP SLOPES.

3) PEAK "ONE" OUTPUT (V_1) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±10% OF THE STANDARD CORE FOR BOTH RAMP SLOPES.

4) PEAK "ZERO" OUTPUT (V_0) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±20%.

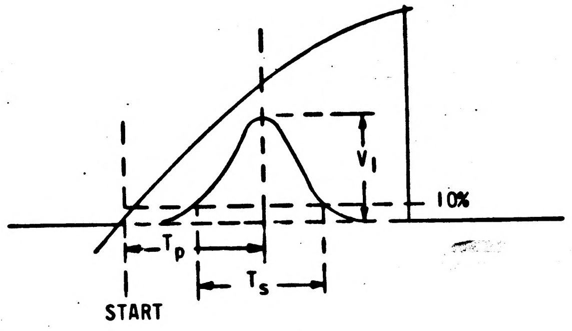

FIGURE 1

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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SIZE C
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR #13663	10/20/64	
A	REVISED PER TDRR 16589	2/24/65	WR

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.

B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.

C. THE PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS.

E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL REQUIREMENTS:

(1) TERMINAL ~~LEAD~~ SHALL BE ALLOY 52 SOLDER DIPPED CERTIFICATION OF COMPLIANCE TO THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPMENT.

TO THIS REQUIREMENT SHALL ACC

B. MARKING:

(1) UNIT AND PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER, POLARITY, AND LOT CODE IDENTIFICATION.

C. ELECTRICAL CHARACTERISTICS: PER TABLE I.

(1) REVERSE CURRENT (I_R)

(2) FORWARD VOLTAGE (V_F)

(3) RECOVERY TIME (T_{RR})

(4) MAXIMUM OVERSHOOT (I_{OS})

(5) REVERSE BREAKDOWN (PIV)

3. DESIGN REQUIREMENTS:

A. MAXIMUM RATINGS AT 25°C.

(1) MAXIMUM RMS VOLTAGE (V_{AC}): 70 VOLTS (INTO RESISTIVE LOAD).

(2) MAXIMUM FORWARD SURGE CURRENT: 225 AMPS, 1/2 CYCLE, 60 CPS, OPERATING AT CASE TEMPERATURE (T_C) 100°C.

(3) MAXIMUM AVERAGE FORWARD CURRENT: 20 AMPS

B. TEMPERATURE RATINGS:

(1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.

(2) STORAGE TEMPERATURE: -65°C TO +175°C.

(3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT

C. CONSTRUCTION:

(1) SEMICONDUCTOR MATERIAL: SILICON.

(2) CASE MATERIAL: NICKEL PLATED STEEL.

(3) STUD MATERIAL: NICKEL PLATTED COPPER ALLOY.

(4) STUD TORQUE: SHALL BE CAPABLE OF 30 INCH-POUNDS MAXIMUM.

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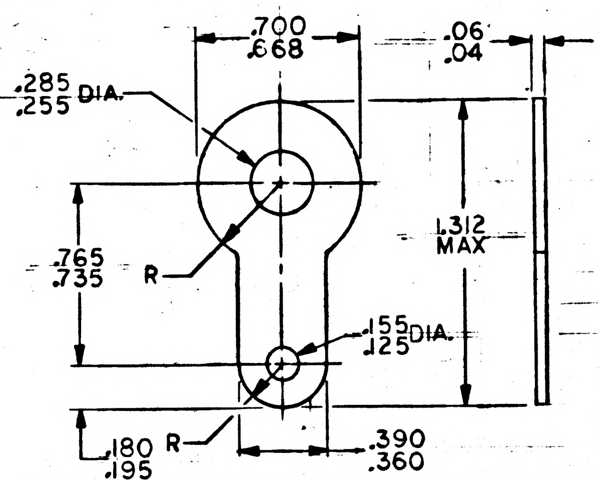
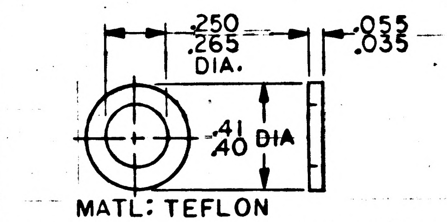
MASTER



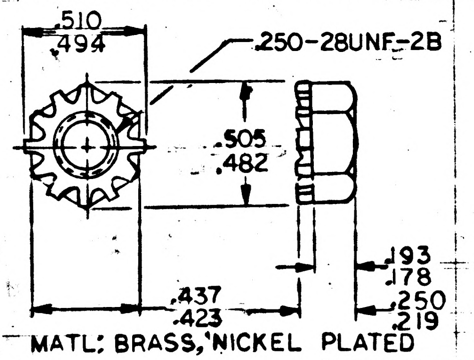
MATL: COPPER, SILVER PLATED

SOLDER-LUG



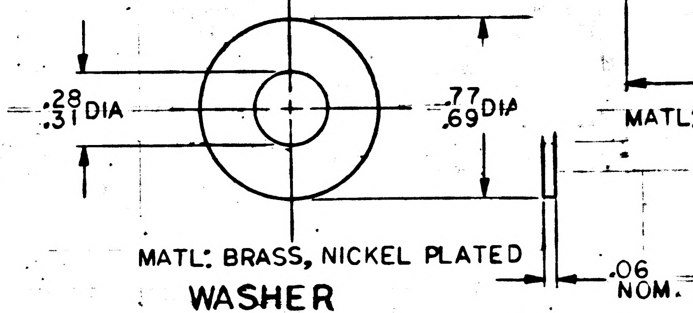
MATL: TEFLON

INSULATING SPACER



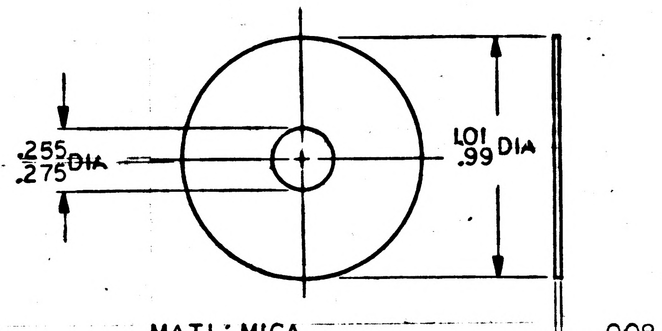
MATL: BRASS, NICKEL PLATED

LOCK NUT



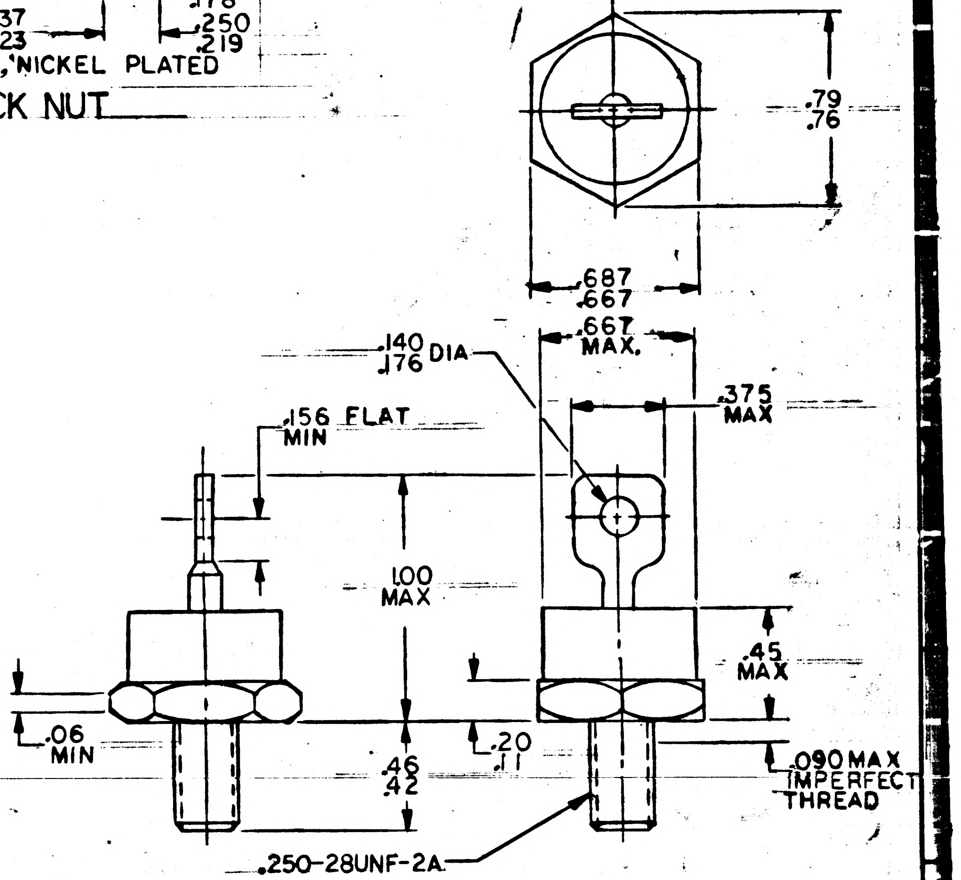
MATL: BRASS, NICKEL PLATED

WASHER



MATL: MICA

INSULATING WASHER



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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CONTRACT

DRAWN D. Nyhuey DATE 6OCT64
CHECKED for J. Adrian 8OCT64
APPROVAL
APPROVAL Eldon C Hall 20 Oct 64
APPROVAL
NASA APPROVAL W J Rhine 10-20-64
MIT APPROVAL
MIT APPROVAL 10/24/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, RECTIFIER
POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006300
SCALE NONE
WT
SHEET 1 OF 2

4 3 2 1

1006300 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13663	[illegible]	[illegible]
A	REVISED PER TDRR 16589	2/24/65	WC

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TABLE I ACCEPTANCE INSPECTION

	ELECTRICAL CHARACTERISTICS				
TEST	CONDITIONS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT
REVERSE BREAKDOWN	I_R = 10 ma; 25°C	PIV	100	-	VOLTS
REVERSE CURRENT	V_R = 30 V; 100°C	I_R	-	10	ma
FORWARD VOLTAGE	I_F = 20 AMP DC AT 25°C	V_F	-	1.2	VDC
FORWARD VOLTAGE	I_F = 7 AMPS DC AT 25°C	V_F	-	0.9	VDC
RECOVERY TIME	I_F = 1 AMP TO 30 VDC REVERSE PER TEST CIRCUIT	T_{RR}	-	200	NANO-SEC
PEAK OVERSHOOT	AS MEASURED DURING RECOVERY TIME TEST	I_{OS}	-	3	AMPS

*SEE FIG. 1&2

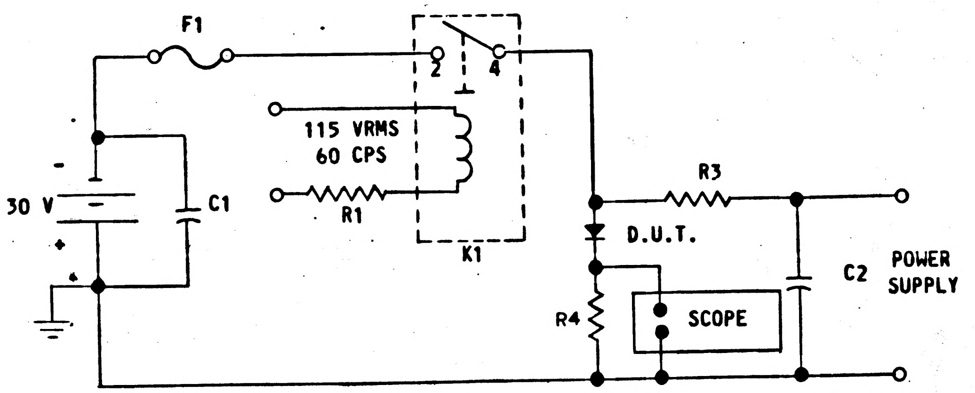

FIG. 2 RECOVERY TIME TEST CIRCUIT

BATTERIES - 5 BURGESS 4F4H(6 VOLT) SER[illegible]

C1, C2 - 1 UF ± 10% 300 VDC OIL FILLED

R1 - 10K 2W 5%

R3 - 30 OHM 30 WATTS 10% CARBON FILM NON-INDUCTIVE

R4 - 1 OHM 10W 1% NON-INDUCTIVE

K1 - HGP-1002 CLARE

F1 - SLO-BLO- 1 AMP

SCOPE - TEKTRONIX 541 OR 545 WITH 53/54K PREAMPLIFIER, P -6000
1:10 ISOLATION PROBE OR EQUIVALENT.

POWER SUPPLY - 35 VOLTS AT 1.0 AMPERE MINIMUM, RIPPLE 3 MILLIVOLTS
RMS OR LESS, OUTPUT IMPEDANCE 1/2 OHM MAXIMUM, DC TO 2000 CPS.

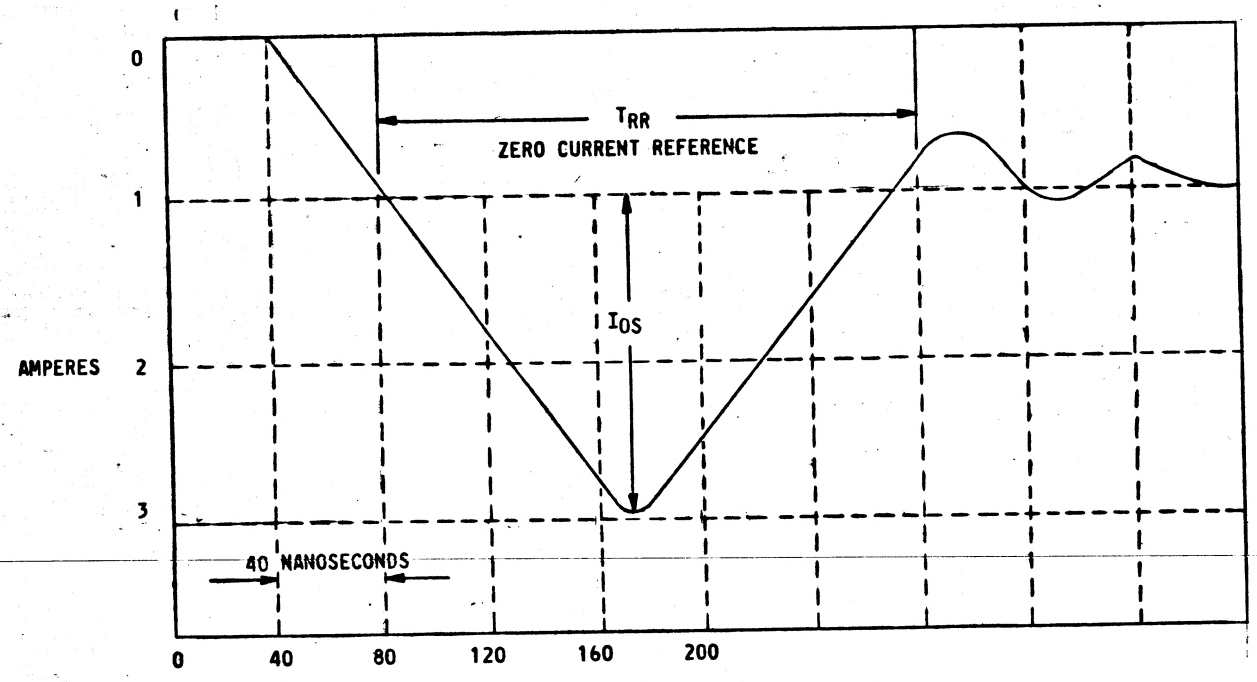

FIG. 1 TYPICAL RECOVERY PATTERN

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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CHECKED [illegible] 3 OCT 64
APPROVAL
APPROVAL Eldon C Hall 30 Oct 64
APPROVAL
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL 10/[illegible]

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SEMICONDUCTOR DEVICE, RECTIFIER
POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006300
SCALE NONE WT SHEET 2 OF 2

MASTER

4 3 2 1

— 1006300

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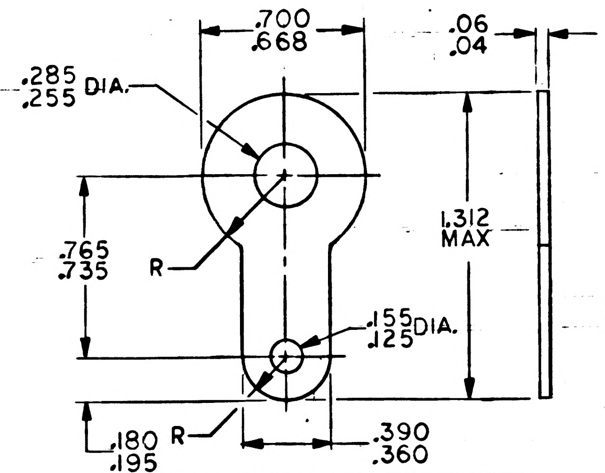
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 13663	10/20/64	

REQUIREMENTS:

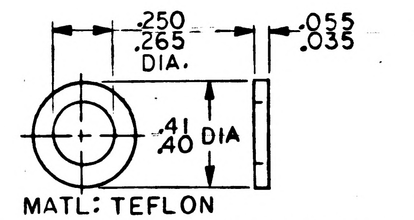
1. GENERAL:
   - A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.
   - C. THE PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS.
   - E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINAL: LEAD SHALL BE IRON-NICKEL-COBALT ALLOY PER ND 1015402 OR ALLOY #52 GOLD PLATED PER MIL-G-45204 CLASS 1. EXCEPT FOR DIMENSIONS CERTIFICATION OF COMPLIANCE TO THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPMENT.
   - B. MARKING:
     - (1) UNIT AND PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER, POLARITY, AND LOT CODE IDENTIFICATION. THE UNIT SHALL BE MARKED WITH THE MANUFACTURER'S NAME.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) REVERSE CURRENT (I_R)
     - (2) FORWARD VOLTAGE (V_F)
     - (3) RECOVERY TIME (T_{RR})
     - (4) MAXIMUM OVERSHOOT (I_{OS})
     - (5) REVERSE BREAKDOWN (PIV)
3. DESIGN REQUIREMENTS:
   - A. MAXIMUM RATINGS AT 25°C.
     - (1) MAXIMUM RMS VOLTAGE (V_{AC}): 70 VOLTS (INTO RESISTIVE LOAD).
     - (2) MAXIMUM FORWARD SURGE CURRENT: 225 AMPS, 1/2 CYCLE, 60 CPS, OPERATING AT CASE TEMPERATURE (T_C) 100°C.
   - B. TEMPERATURE RATINGS:
     - (1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.
     - (2) STORAGE TEMPERATURE: -65°C TO +175°C.
     - (3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT
   - C. CONSTRUCTION:
     - (1) SEMICONDUCTOR MATERIAL: SILICON.
     - (2) CASE MATERIAL: NICKEL PLATED STEEL.
     - (3) STUD MATERIAL: NICKEL PLATTED COPPER ALLOY.
     - (4) STUD TORQUE: SHALL BE CAPABLE OF 30 INCH-POUNDS MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



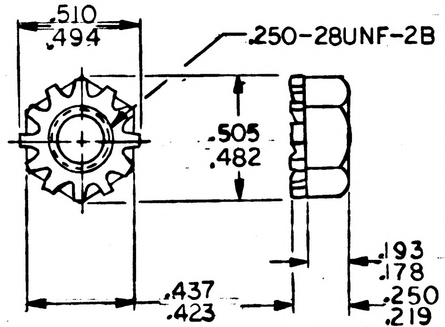
MATL: COPPER, SILVER PLATED

SOLDER-LUG



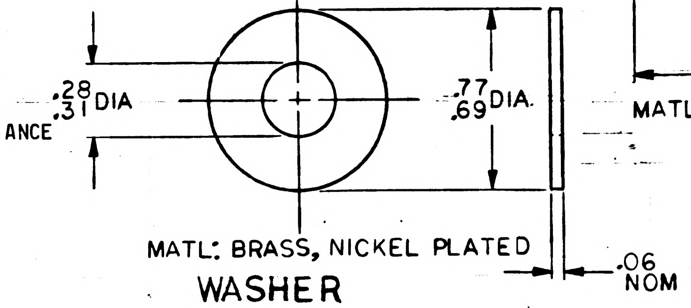
MATL: TEFLON

INSULATING SPACER



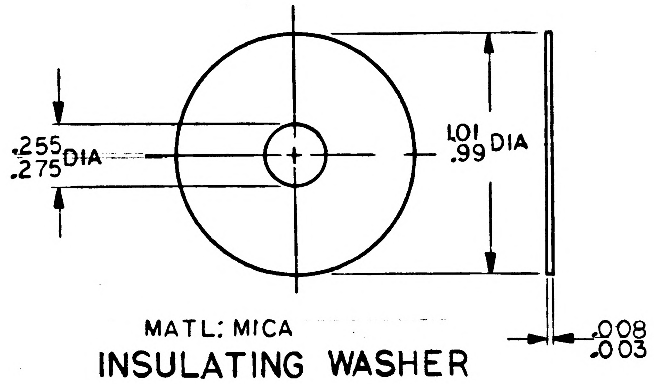
MATL: BRASS, NICKEL PLATED

LOCK NUT



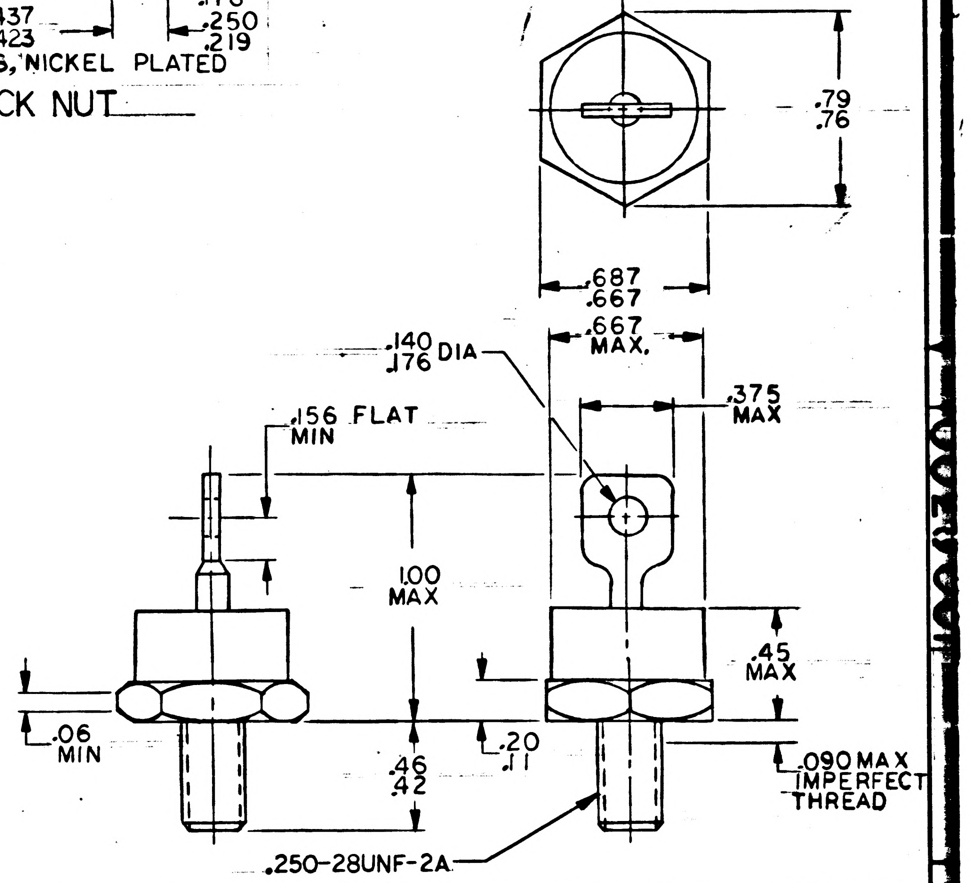
MATL: BRASS, NICKEL PLATED

WASHER



MATL: MICA

INSULATING WASHER



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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CHECKED J. Adrian 8 OCT 64
APPROVAL
APPROVAL Eldon C Hall 20 Oct 64
APPROVAL
NASA APPROVAL W J Rhine 10/20/64
MIT APPROVAL 10/20/64
MIT APPROVAL

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HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, RECTIFIER
POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006300
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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– 1006300

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 13663	10/26/64	eem

TABLE I ACCEPTANCE INSPECTION

TEST	ELECTRICAL CHARACTERISTICS CONDITIONS	SYMBOL	LIMITS MIN	 MAX	UNIT	LTPD %
REVERSE BREAKDOWN	I_R = 10 ma; 25°C	PIV	100	-	VOLTS	5
REVERSE CURRENT	V_R = 30 V; 100°C	I_R	-	10	ma	
FORWARD VOLTAGE	I_F = 20 AMP DC AT 25°C	V_F	-	1.2	VDC	
RECOVERY TIME *	I_F = 1 AMP TO 30 VDC REVERSE PER TEST CIRCUIT	T_{RR}	-	200	NANO-SEC	
PEAK OVERSHOOT	AS MEASURED DURING RECOVERY TIME TEST	I_{OS}	-	2	AMPS	

* SEE FIG. 1 AND 2

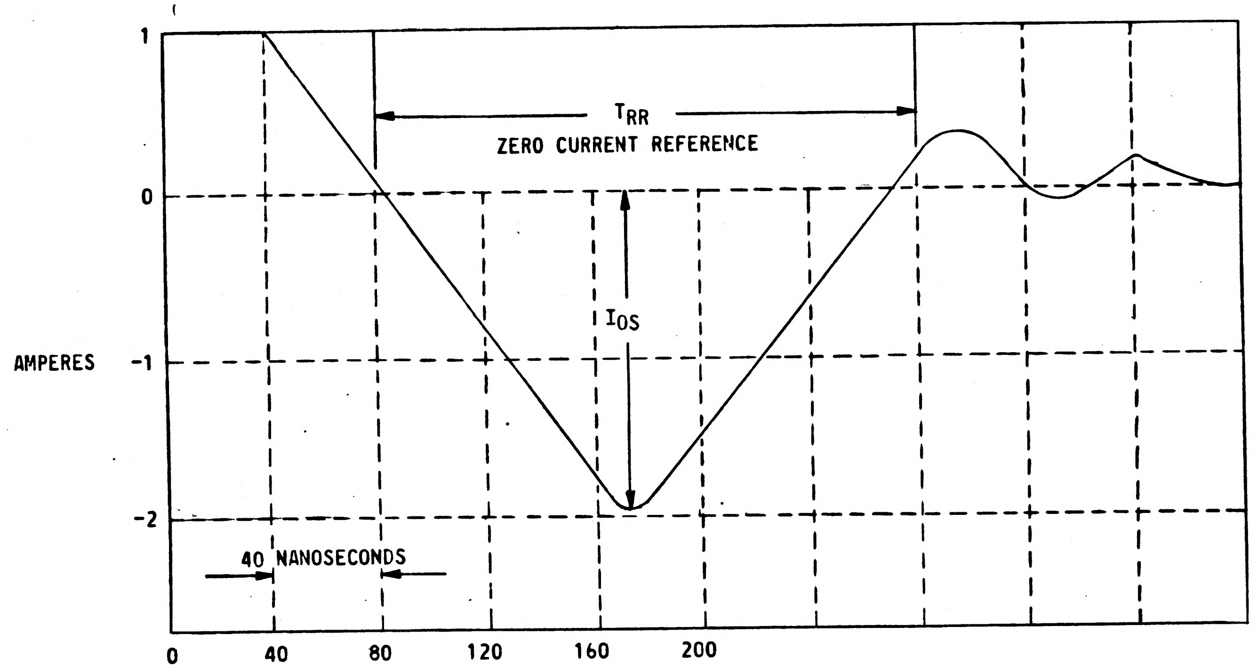

FIG. 1 TYPICAL RECOVERY PATTERN

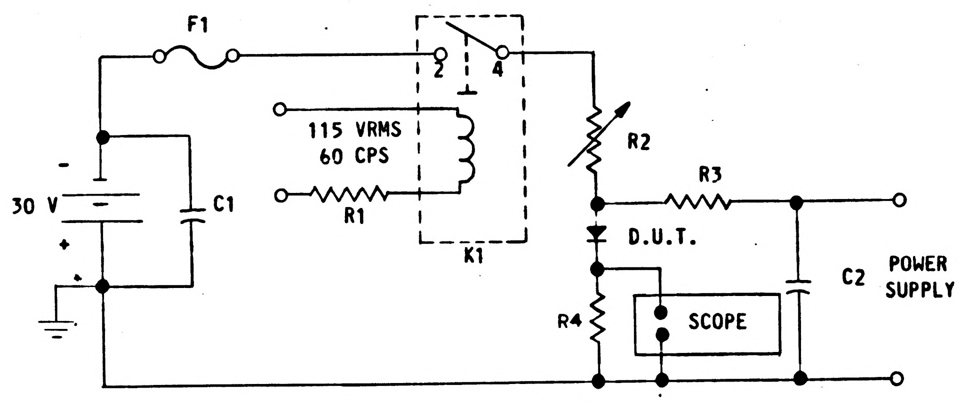

FIG. 2 RECOVERY TIME TEST CIRCUIT

BATTERIES - 5 BURGESS 4F4H(6 VOLT) SERIES
C1, C2 - 1 UF ± 10% 300 VDC OIL FILLED
R1 - 10K 2W 5%
R2 - 3 OHM 25W POTENTIOMETER
R3 - 30 OHM 30 WATTS 10% CARBON FILM NON-INDUCTIVE
R4 - 1 OHM 10W 1% NON-INDUCTIVE
K1 - HGP-1002 CLARE
F1 - SLO-BLO- 1 AMP

SCOPE - TEKTRONIX 541 OR 545 WITH 53/54K PREAMPLIFIER, P -6000 1:10 ISOLATION PROBE OR EQUIVALENT.

POWER SUPPLY - 35 VOLTS AT 1.0 AMPERE MINIMUM, RIPPLE 3 MILLIVOLTS RMS OR LESS, OUTPUT IMPEDANCE 1/2 OHM MAXIMUM, DC TO 2000 CPS.

NOTE: WIRE AND ADJUST R2 SO RESISTANCE FROM RELAY TO ANODE OF D.U.T. IS 1.4 ± .05 OHMS, INDUCTANCE LESS THAN 2 MICROHENRIES.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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APPROVAL Eldon C Hall 20 Oct 64
APPROVAL
NASA APPROVAL W J Rhine 20 Oct 64
MIT APPROVAL 10/20/64
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SEMICONDUCTOR DEVICE, RECTIFIER
POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006300
SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006302 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR PUSH-PULL COUPLING, NUT MOUNTING, CLASS E SEAL, PIN OR SOCKET CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002052.

   E. MARKING:

      (1) PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.

      (2) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), SUPPLIER'S LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING.

   F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

2. ACCEPTANCE AND INSPECTION

   A. DIMENSIONS: AS DELINEATED HEREIN.

   B. ELECTRICAL CHARACTERISTICS WHEN TESTED USING CONTACTS PER ND 1010770.

      (1) INSULATION RESISTANCE: (MIL-STD-202, METHOD 302, CONDITION B)
      AT 25°C; 100,000 MEGOHMS MINIMUM AT 500 VDC
      AT 125°C; 5,000 MEGOHMS MINIMUM AT 500 VDC

      (2) DIELECTRIC WITHSTANDING VOLTAGE: (MIL-STD-202, METHOD 301)
      375 VRMS AT 70,000 FT ALTITUDE. 1500 VRMS AT SEA LEVEL

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

      (1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.

      (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

   A. OPERATING LIFE (DURABILITY): 500 MINIMUM MATINGS AND UNMATINGS USING PLUG ND 1010771 AND CONTACTS PER ND 1010770.

   B. ELECTRICAL CHARACTERISTICS (RATINGS):

      (1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM

      (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC

      (3) CONTACT RESISTANCE: 7 MILLIVOLTS AT 3 AMPERES

   C. MECHANICAL REQUIREMENTS:

      (1) COUPLING MECHANISM: BALL AND DETENT
      (2) ENGAGING & DISENGAGING FORCE: PER TABLE II
      (3) MOUNTING: SHALL MOUNT TO A .093 MAXIMUM PANEL
      (4) CONTACT RETENTION: 20 LBS MIN IN DIRECTION OF MATING FORCES
      (5) ALTITUDE IMMERSION, PER MIL-C-26500

   D. MATERIAL & FINISH

      (1) SHELL & HEX NUT ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482 WITH A CLEAR CONDUCTIVE ANODIZE (NON-OUTGASSING)

      (2) INSERT: SOLID DIELECTRIC PER MIL-C-26482 AND MIL-M-14 (TYPE MFH) THIS MATERIAL SHALL BE NON-TOXIC OUTGASSING.

      (3) PANEL SEAL AND INSERT GROMMET: SILICONE RUBBER

      (4) LOCK WASHER: BRONZE (HEAT TREATED), NICKEL PLATED

   E. ACCESSORY PARTS:

      (1) MATING PLUGS: IN ACCORDANCE WITH ND 1010771.

      (2) CONTACT PINS & SOCKETS: IN ACCORDANCE WITH ND 1010770. (SEE TABLE I)

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTE

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DRAWN D. Young DM DATE 28 OCT 64
CHECKED R.T. Dronsuk 2 NOV 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 15 Dec 64
NASA APPROVAL 12/15/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

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CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006302
SCALE NONE
WT
SHEET 1 OF 2

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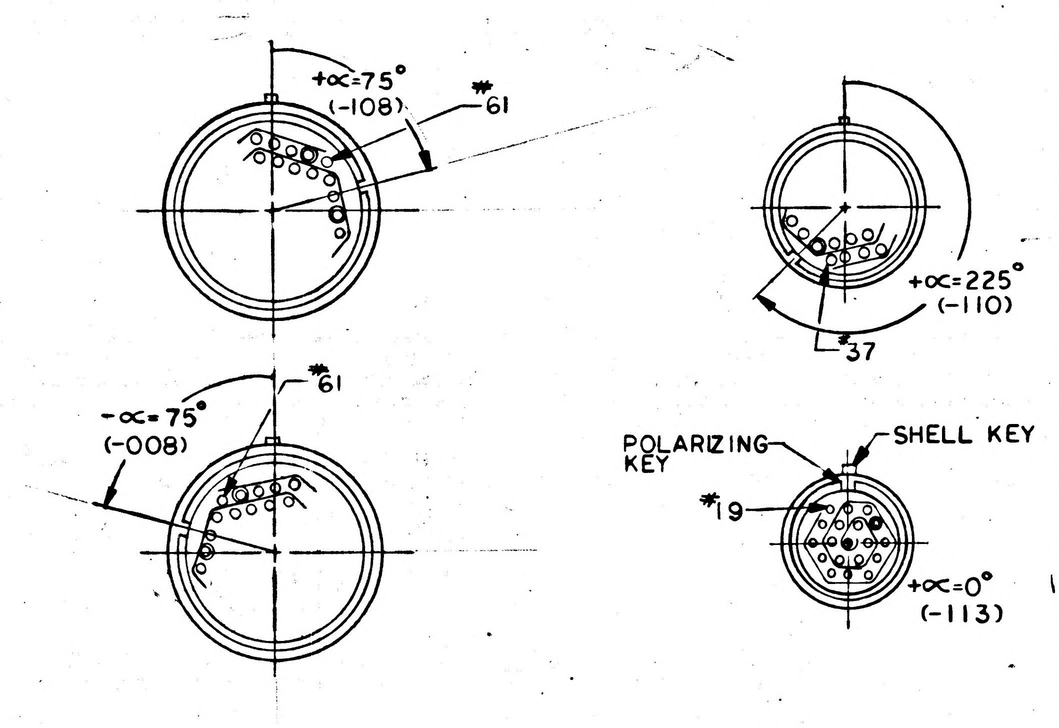
1006302 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK

+∝ (CW) = PINS
−∝ (CCW) = SOCKETS

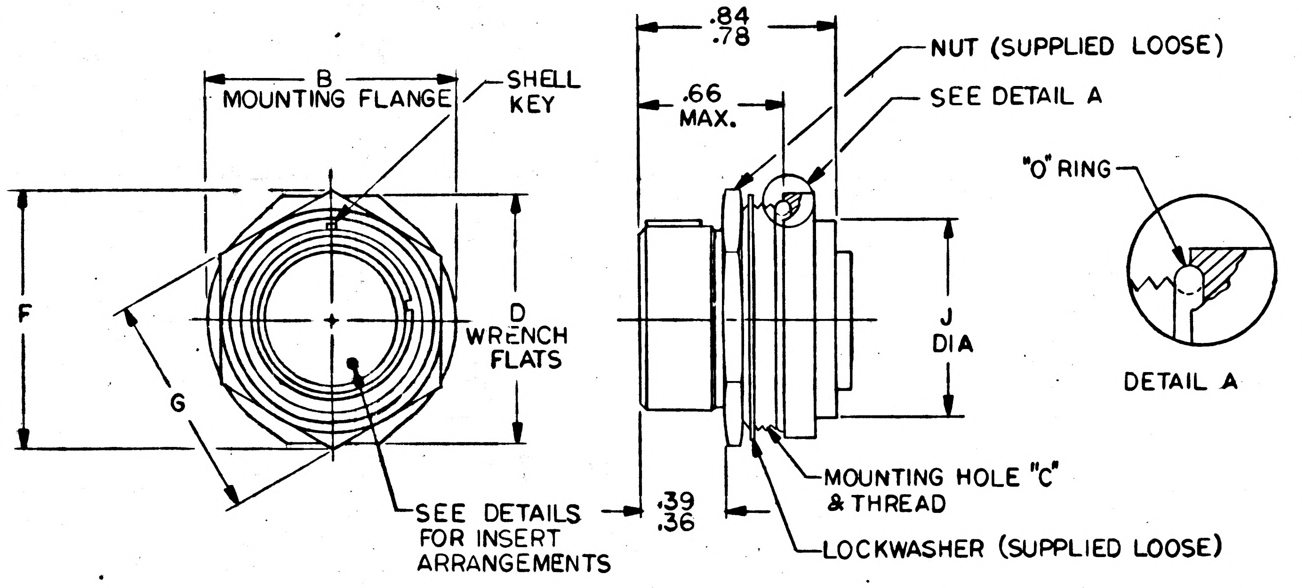


+∝=75°
(-108)
#61
+∝=225°
(-110)
37
−∝=75°
(-008)
#61
POLARIZING KEY
SHELL KEY
#19
+∝=0°
(-113)

DETAILS – TYPICAL POLARIZATION

TABLE I

DASH NO. (SOCKETS)	DASH NO. (PINS)	INSERT POLARIZING ANGLE ± ∝	CONTACTS ACCOMODATED	SHELL SIZE TABLE II
-001	-101	0°	91	27
-002	-102	225°		
-003	-103	150°		
-004	-104	75°		
-005	-105	0°	61	19
-006	-106	225°		
-007	-107	150°		
-008	-108	75°		
-009	-109	0°	37	12
-010	-110	225°		
-011	-111	150°		
-012	-112	75°		
-013	-113	0°	19	7
-014	-114	225°		
-015	-115	150°		
-016	-116	75°		
-017	-117	0°	7	3
-018	-118	225°		
-019	-119	150°		
-020	-120	75°		



B
MOUNTING FLANGE
SHELL KEY
F
G
D
WRENCH FLATS
SEE DETAILS FOR INSERT ARRANGEMENTS
.84
.78
.66
MAX.
NUT (SUPPLIED LOOSE)
SEE DETAIL A
J
DIA
.39
.36
MOUNTING HOLE "C" & THREAD
LOCKWASHER (SUPPLIED LOOSE)
"O" RING
DETAIL A

TABLE II

SHELL SIZE	B ±.015	C +.020 −.005 & THREAD (REF.)	D ±.015	F ±.015	G ±.015	J ±.015	MAX ENGAGEMENT FORCE LBS	MIN ENGAGEMENT FORCE LBS
7	.875	.696 11/16-24 NEF-2	.875	.938	.812	.688	20	3.75
12	1.062	.818 13/16-20UNEF-2	1.062	1.083	.938	.812	25	3.75
19	1.188	1.010 1-20UNEF-2	1.156	1.227	1.062	.938	35	3,75
27	1.312	1.135 1-1/8-18NEF-2	1.312	1.443	1.250	1.062	40	3.75
3	.750	.571 9/16-24NEF-2	.750	.712	.625	.609	10	3.75

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Morey DATE 2 Nov 64
CHECKED R.T. Dronsuk 2 Nov 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 15 Dec 64
NASA APPROVAL 12/15/64
MIT APPROVAL
MIT APPROVAL W Cooper 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL, MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006302
SCALE NONE	WT	SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR PUSH-PULL COUPLING, NUT MOUNTING, CLASS E SEAL, PIN OR SOCKET CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF MIL-C-26482

E. MARKING:

(1) PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.

(2) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), SUPPLIER'S LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING.

F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

2. ACCEPTANCE AND INSPECTION

A. DIMENSIONS: AS DELINEATED HEREIN.

B. ELECTRICAL CHARACTERISTICS WHEN TESTED USING CONTACTS PER ND 1010770.

(1) INSULATION RESISTANCE: (MIL-STD-202, METHOD 302, CONDITION B)
AT 25°C; 100,000 MEGOHMS MINIMUM AT 500 VDC
AT 125°C; 5,000 MEGOHMS MINIMUM AT 500 VDC

(2) DIELECTRIC WITHSTANDING VOLTAGE: (MIL-STD-202, METHOD 301)
375 VRMS AT 70,000 FT ALTITUDE. 1500 VRMS AT SEA LEVEL

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

A. OPERATING LIFE (DURABILITY): 500 MINIMUM MATINGS AND UNMATINGS USING PLUG ND 1010771 AND CONTACTS PER ND 1010770.

B. ELECTRICAL CHARACTERISTICS (RATINGS):

(1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM

(2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC

(3) CONTACT RESISTANCE: 7 MILLIVOLTS AT 3 AMPERES

C. MECHANICAL REQUIREMENTS:

(1) COUPLING MECHANISM: BALL AND DETENT

(2) ENGAGING & DISENGAGING FORCE: PER TABLE II

(3) MOUNTING: SHALL MOUNT TO A .093 MAXIMUM PANEL.

(4) CONTACT RETENTION: 20 LBS MIN IN DIRECTION OF MATING FORCES

(5) ALTITUDE IMMERSION, PER MIL-C-26500

D. MATERIAL & FINISH

(1) SHELL & HEX NUT ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482 WITH A CLEAR CONDUCTIVE ANODIZE (NON-OUTGASSING).

(2) INSERT: SOLID DIELECTRIC PER MIL-C-26482 AND MIL-M-14 (TYPE MFM) THIS MATERIAL SHALL BE NON-TOXIC OUTGASSING.

(3) PANEL SEAL AND INSERT GROMMET: SILICONE RUBBER

(4) LOCK WASHER: BRONZE (HEAT TREATED), NICKEL PLATED

E. ACCESSORY PARTS:

(1) MATING PLUGS: IN ACCORDANCE WITH ND 1010771.

(2) CONTACT PINS & SOCKETS: IN ACCORDANCE WITH ND 1010770. (SEE TABLE I)

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 28 OCT 64
CHECKED
APPROVAL
APPROVAL
APPROVAL 15 Dec 64
NASA APPROVAL 12/18/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

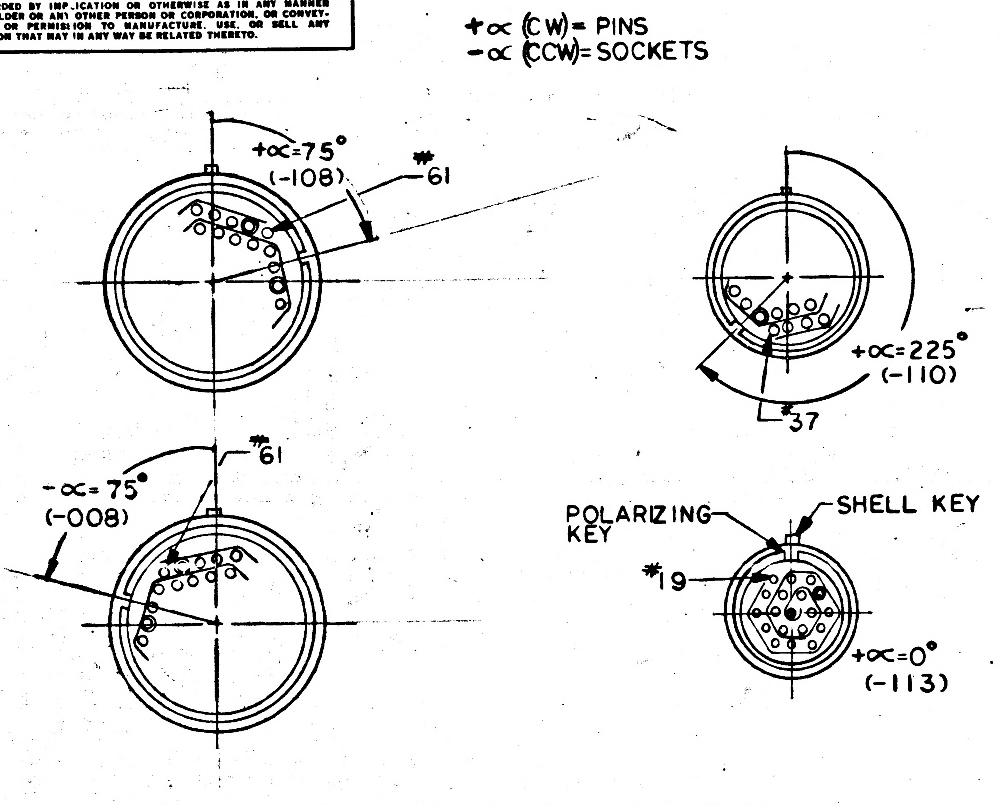
CONNECTOR, RECEPTACLE, ELECTRICAL, MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C
NASA DRAWING NO. 1006302
SCALE NONE WT SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 B

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK

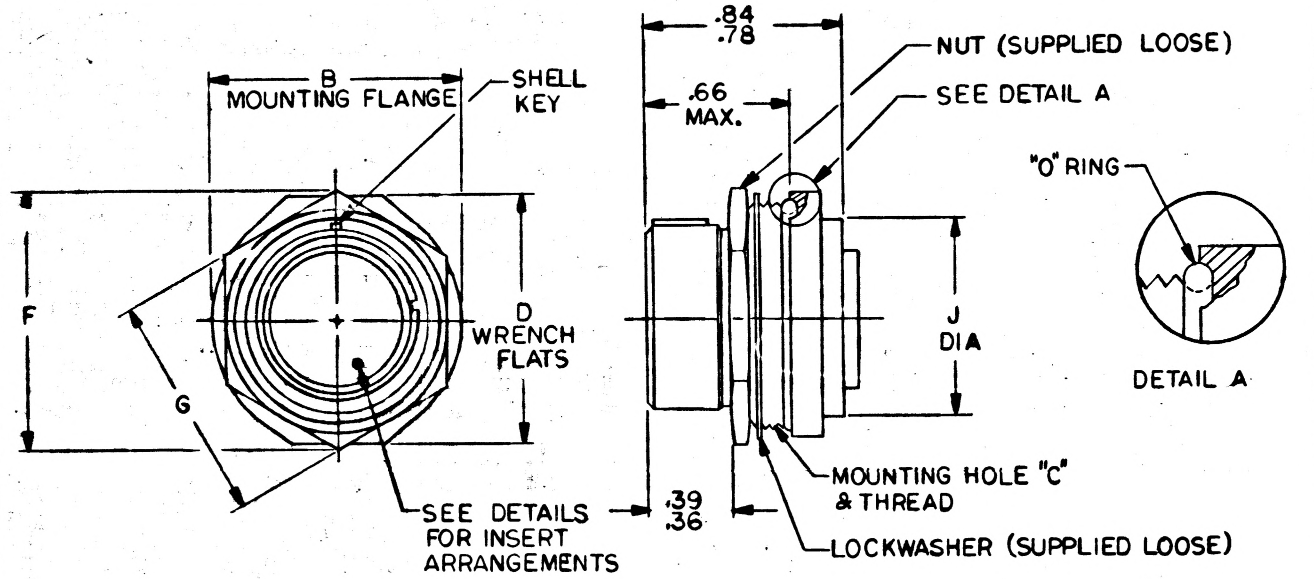


+∝ (CW) = PINS
-∝ (CCW) = SOCKETS
+∝=75°
(-108)
#61
+∝=225°
(-110)
#37
-∝= 75°
(-008)
#61
POLARIZING KEY
SHELL KEY
#19
+∝=0°
(-113)

DETAILS–TYPICAL POLARIZATION

TABLE I

DASH NO. (SOCKETS)	DASH NO. (PINS)	INSERT POLARIZING ANGLE ± ∝	CONTACTS ACCOMODATED	SHELL SIZE TABLE II
-001	-101	0°	91	27
-002	-102	225°		
-003	-103	150°		
-004	-104	75°		
-005	-105	0°	61	19
-006	-106	225°		
-007	-107	150°		
-008	-108	75°		
-009	-109	0°	37	12
-010	-110	225°		
-011	-111	150°		
-012	-112	75°		
-013	-113	0°	19	7
-014	-114	225°		
-015	-115	150°		
-016	-116	75°		
-017	-117	0°	7	3
-018	-118	225°		
-019	-119	150°		
-020	-120	75°		



B
MOUNTING FLANGE
SHELL KEY
F
G
D
WRENCH FLATS
SEE DETAILS FOR INSERT ARRANGEMENTS
.84
.78
.66 MAX.
NUT (SUPPLIED LOOSE)
SEE DETAIL A
"O" RING
J DIA
DETAIL A
.39
.36
MOUNTING HOLE "C" & THREAD
LOCKWASHER (SUPPLIED LOOSE)

TABLE II

SHELL SIZE	B ±.015	C +.020 −.005 & THREAD (REF.)	D ±.015	F ±.015	G ±.015	J ±.015	ENGAGEMENT FORCE LBS MAX	ENGAGEMENT FORCE LBS MIN
7	.875	.696 11/16-24 NEF-2	.875	.938	.812	.688	20	3.75
12	1.062	.818 13/16-20UNEF-2	1.062	1.083	.938	.812	25	3.75
19	1.188	1.010 1-20UNEF-2	1.156	1.227	1.062	.938	35	3,75
27	1.312	1.135 1-1/8-18NEF-2	1.312	1.443	1.250	1.062	40	3.75
3	.750	.571 9/16-24NEF-2	.750	.712	.625	.609	10	3.75

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Marcus DATE 2 Nov 64
CHECKED R.T. Dronsuk 2 Nov 64
APPROVAL
APPROVAL
APPROVAL Ellen C Hall 15 Dec 64
NASA APPROVAL 12/17/64
MIT APPROVAL
MIT APPROVAL W Kupfer 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006302
SCALE NONE WT SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR PUSH-PULL COUPLING, NUT MOUNTING, CLASS E SEAL, PIN OR SOCKET CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. PARTS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS OF MIL-C-26482

E. MARKING:

(1) PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.

(2) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), SUPPLIER'S LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING.

F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

2. ACCEPTANCE AND INSPECTION

A. DIMENSIONS: AS DELINEATED HEREIN.

B. ELECTRICAL CHARACTERISTICS WHEN TESTED USING CONTACTS PER ND 1010770.

(1) INSULATION RESISTANCE: (MIL-STD-202, METHOD 302, CONDITION B)
AT 25°C; 100,000 MEGOHMS MINIMUM AT 500 VDC
AT 125°C; 5,000 MEGOHMS MINIMUM AT 500 VDC

(2) DIELECTRIC WITHSTANDING VOLTAGE: (MIL-STD-202, METHOD 301)
375 VRMS AT 70,000 FT ALTITUDE. 1500 VRMS AT SEA LEVEL

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

A. OPERATING LIFE (DURABILITY): 500 MINIMUM MATINGS AND UNMATINGS USING PLUG ND 1010771 AND CONTACTS PER ND 1010770.

B. ELECTRICAL CHARACTERISTICS (RATINGS):

(1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM

(2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC

(3) CONTACT RESISTANCE: REAR OF PIN CONTACT CRIMP BARREL TO REAR OF SOCKET CONTACT CRIMP BARREL.
(a) 7 MILLIVOLTS MAX AT 3 AMPERES
(b) 20 MILLIVOLTS MAX AT 10 MILLIAMPERES

C. MECHANICAL REQUIREMENTS:

(1) COUPLING MECHANISM: BALL AND DETENT
(2) ENGAGING & DISENGAGING FORCE: PER TABLE II
(3) MOUNTING: SHALL MOUNT TO A .093 MAXIMUM PANEL
(4) CONTACT RETENTION: 20 LBS MIN IN DIRECTION OF MATING FORCES
(5) ALTITUDE IMMERSION, PER MIL-C-26500

D. MATERIAL & FINISH

(1) SHELL & HEX NUT ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482 WITH A CLEAR CONDUCTIVE ANODIZE (NON-OUTGASSING)

(2) INSERT: SOLID DIELECTRIC PER MIL-C-26482 AND MIL-M-14 (TYPE MFH) OR EQUIVALENT. THIS MATERIALL SHALL BE NON-TOXIC OUTGASSING.

(3) PANEL SEAL AND INSERT GROMMET: SILICONE RUBBER

(4) LOCK WASHER: BRONZE (HEAT TREATED), NICKEL PLATED

E. ACCESSORY PARTS:

(1) MATING PLUGS: IN ACCORDANCE WITH ND 1010771.

(2) CONTACT PINS & SOCKETS: IN ACCORDANCE WITH ND 1010770. (SEE TABLE I)

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN D. Young DATE 28 OCT 64
CHECKED R.T. Dronsuker
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 15 Dec 64
NASA APPROVAL 12/14/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006302

SCALE NONE
WT
SHEET 1 OF

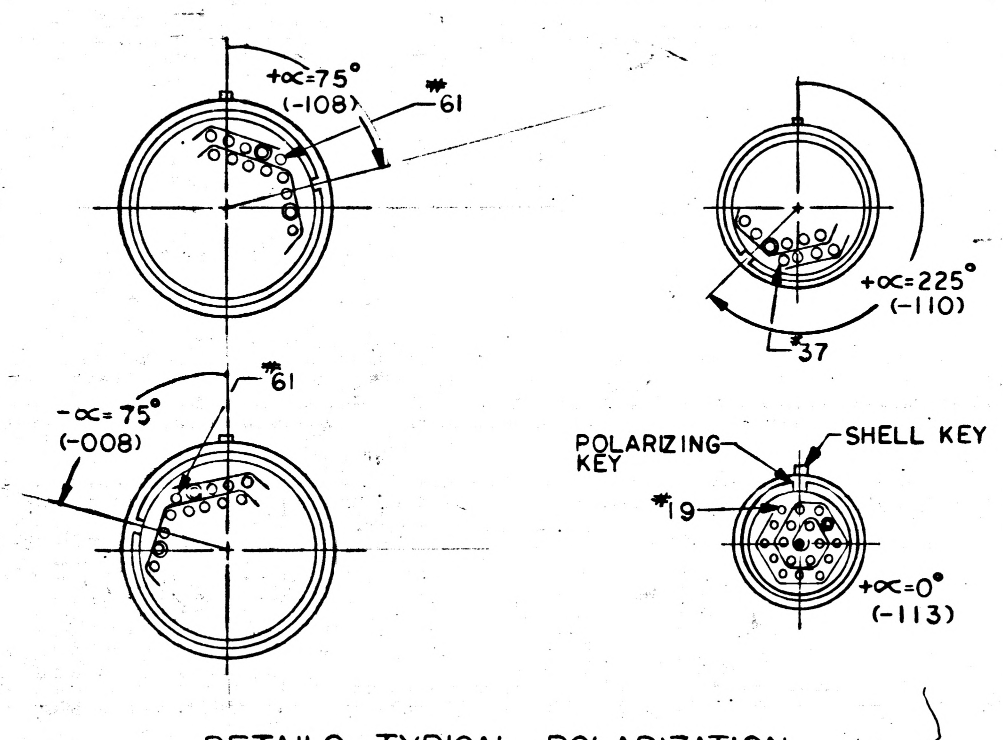
1006302 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK

+∝ (CW) = PINS
−∝ (CCW) = SOCKETS



+∝=75°
(-108)
*61
+∝=225°
(-110)
37
−∝=75°
(-008)
*61
POLARIZING KEY
SHELL KEY
*19
+∝=0°
(-113)

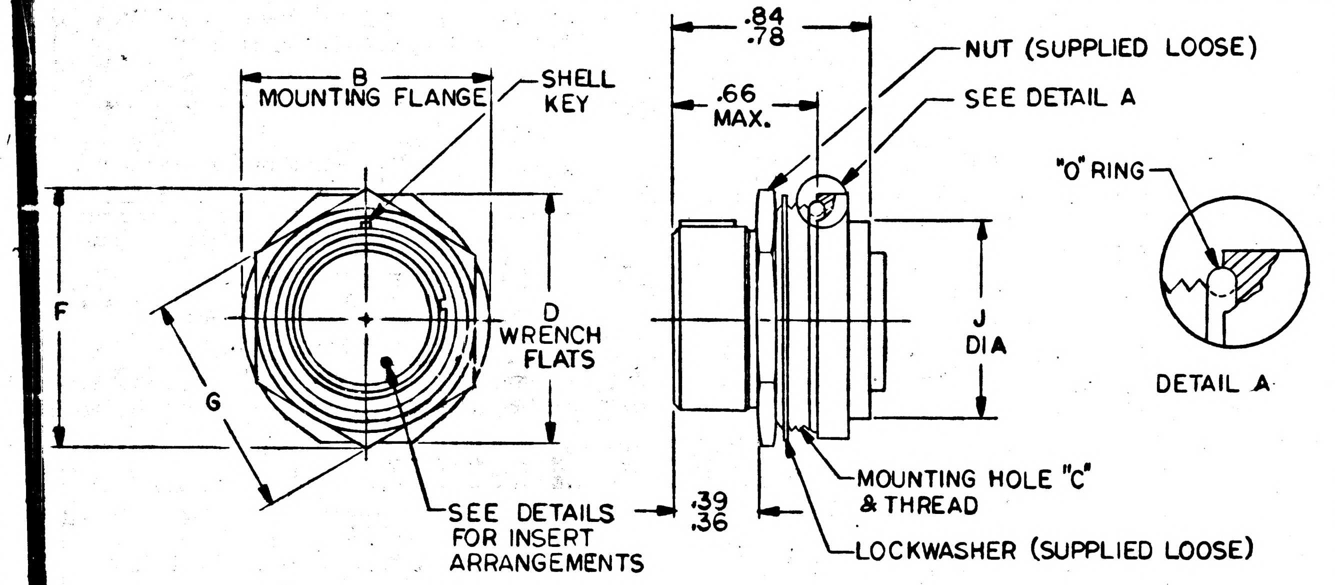
DETAILS - TYPICAL POLARIZATION

TABLE I

DASH NO. (SOCKETS)	DASH NO. (PINS)	INSERT POLARIZING ANGLE ± ∝	CONTACTS ACCOMODATED	SHELL SIZE TABLE II
-001	-101	0°	91	27
-002	-102	225°		
-003	-103	150°		
-004	-104	75°		
-005	-105	0°	61	19
-006	-106	225°		
-007	-107	150°		
-008	-108	75°		
-009	-109	0°	37	12
-010	-110	225°		
-011	-111	150°		
-012	-112	75°		
-013	-113	0°	19	7
-014	-114	225°		
-015	-115	150°		
-016	-116	75°		
-017	-117	0°	7	3
-018	-118	225°		
-019	-119	150°		
-020	-120	75°		

TABLE II

SHELL SIZE	B ±.015	C +.020 −.005 & THREAD (REF.)	D ±.015	F ±.015	G ±.015	J ±.015	MAX ENGAGEMENT FORCE LBS	MIN ENGAGEMENT FORCE LBS
7	.875	.696 11/16-24 NEF-2	.875	.938	.812	.688	20	3.75
12	1.062	.818 13/16-20UNEF-2	1.062	1.083	.938	.812	25	3.75
19	1.188	1.010 1-20UNEF-2	1.156	1.227	1.062	.938	35	3,75
27	1.312	1.135 1-1/8-18NEF-2	1.312	1.443	1.250	1.062	40	3.75
3	.750	.571 9/16-24NEF-2	.750	.712	.625	.609	10	3.75



B
MOUNTING FLANGE
SHELL KEY
.84
.78
.66
MAX.
NUT (SUPPLIED LOOSE)
SEE DETAIL A
"O" RING
F
G
D
WRENCH FLATS
J
DIA
DETAIL A
SEE DETAILS FOR INSERT ARRANGEMENTS
.39
.36
MOUNTING HOLE "C" & THREAD
LOCKWASHER (SUPPLIED LOOSE)

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Morey DATE 2 Nov 64
CHECKED R.T. Dromerko 2 Nov 64
APPROVAL
APPROVAL
APPROVAL Ellen C Hall 15 Dec 64
NASA APPROVAL 12/9/64
MIT APPROVAL
MIT APPROVAL W Kupfer 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006302
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 D

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	~~INITIAL RELEASE CLASS A~~ PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK
D	REVISED PER TDRR 21587	8/31/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR PUSH-PULL COUPLING, NUT MOUNTING, CLASS E SEAL, PIN OR SOCKET CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. PARTS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS OF MIL-C-26482

E. MARKING:

(1) PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.

(2) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), SUPPLIER'S LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING.

F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

2. ACCEPTANCE AND INSPECTION

A. DIMENSIONS: AS DELINEATED HEREIN.

B. ELECTRICAL CHARACTERISTICS WHEN TESTED USING CONTACTS PER ND 1010770.

(1) INSULATION RESISTANCE: (MIL-STD-202, METHOD 302, CONDITION B)
AT 25°C; 100,000 MEGOHMS MINIMUM AT 500 VDC
AT 125°C; 5,000 MEGOHMS MINIMUM AT 500 VDC

(2) DIELECTRIC WITHSTANDING VOLTAGE: (MIL-STD-202, METHOD 301)
375 VRMS AT 70,000 FT ALTITUDE.1500 VRMS AT SEA LEVEL

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

A. OPERATING LIFE (DURABILITY): 500 MINIMUM MATINGS AND UNMATINGS USING PLUG ND 1010771 AND CONTACTS PER ND 1010770.

B. ELECTRICAL CHARACTERISTICS (RATINGS):

(1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM

(2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC

(3) CONTACT RESISTANCE: REAR OF PIN CONTACT CRIMP BARREL TO REAR OF SOCKET CONTACT CRIMP BARREL.
(a) 7 MILLIVOLTS MAX AT 3 AMPERES
(b) 20 MILLIVOLTS MAX AT 10 MILLIAMPERES

C. MECHANICAL REQUIREMENTS:

(1) COUPLING MECHANISM: BALL AND DETENT
(2) ENGAGING & DISENGAGING FORCE: PER TABLE II
(3) MOUNTING: SHALL MOUNT TO A .093 MAXIMUM PANEL
(4) CONTACT RETENTION: 20 LBS MIN IN DIRECTION OF MATING FORCES
(5) ALTITUDE IMMERSION, PER MIL-C-26500

D. MATERIAL & FINISH

(1) SHELL & HEX NUT ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482 WITH A CLEAR CONDUCTIVE ANODIZE (NON-OUTGASSING)

(2) INSERT: SOLID DIELECTRIC PER MIL-C-26482 AND MIL-M-14 (TYPE MFH) OR EQUIVALENT. THIS MATERIALL SHALL BE NON-TOXIC OUTGASSING.

(3) PANEL SEAL AND INSERT GROMMET: SILICONE RUBBER

(4) LOCK WASHER: BRONZE (HEAT TREATED), NICKEL PLATED

E. ACCESSORY PARTS:

(1) MATING PLUGS: IN ACCORDANCE WITH ND 1010771.

(2) CONTACT PINS & SOCKETS: IN ACCORDANCE WITH ND 1010770. (SEE TABLE I)

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Young DM DATE 28 OCT 64
CHECKED R.T. Dronsuko 2 NOV 64
APPROVAL
APPROVAL
APPROVAL Ella C Hall 15 Dec 64
NASA APPROVAL 12/15/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

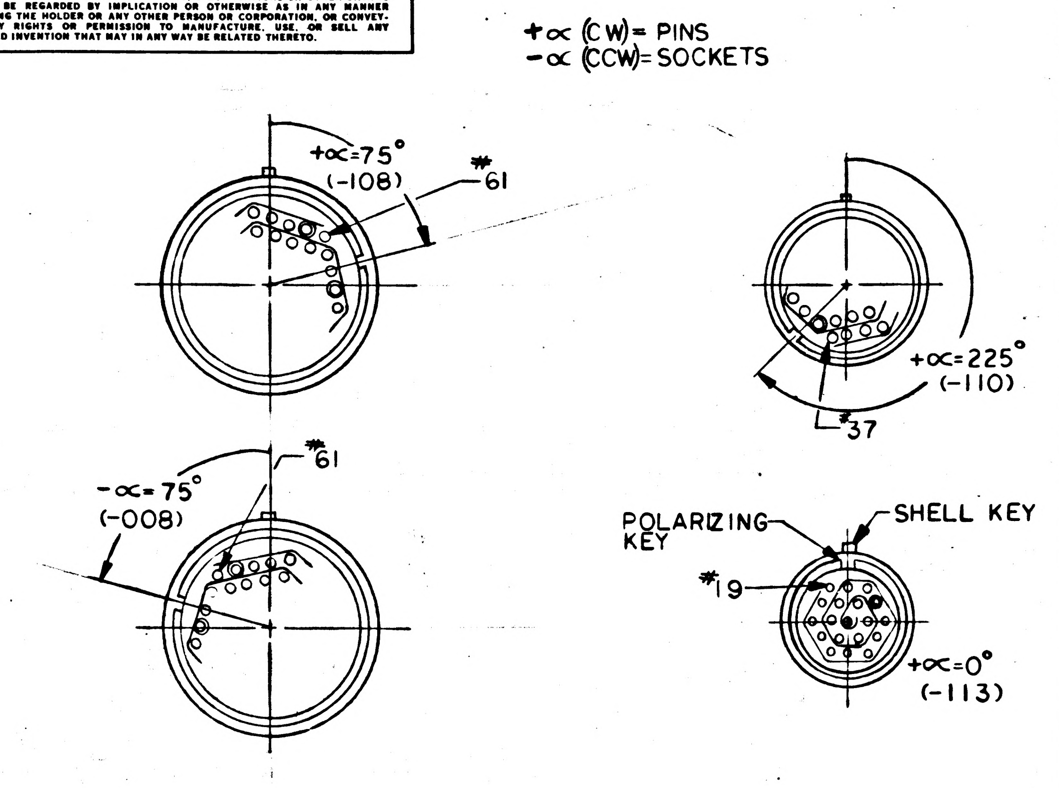
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
80230	C	1006302	
SCALE NONE	WT		SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK
D	REVISED PER TDRR 21587	8/3/65	WK

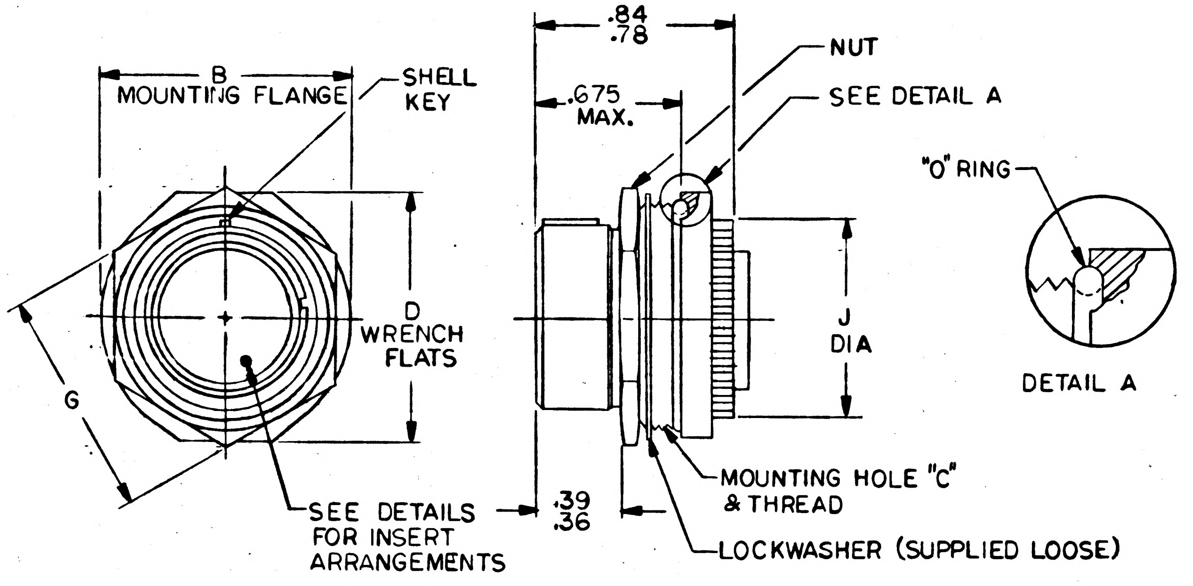


+∝ (CW)= PINS
-∝ (CCW)= SOCKETS
+∝=75°
(-108)
#61
+∝=225°
(-110)
#37
-∝=75°
(-008)
#61
POLARIZING KEY
SHELL KEY
#19
+∝=0°
(-113)

DETAILS-TYPICAL POLARIZATION

TABLE I

DASH NO. (SOCKETS)	DASH NO. (PINS)	INSERT POLARIZING ANGLE ± ∝	CONTACTS ACCOMODATED	SHELL SIZE TABLE II
-001	-101	0°	91	27
-002	-102	225°		
-003	-103	150°		
-004	-104	75°		
-005	-105	0°	61	19
-006	-106	225°		
-007	-107	150°		
-008	-108	75°		
-009	-109	0°	37	12
-010	-110	225°		
-011	-111	150°		
-012	-112	75°		
-013	-113	0°	19	7
-014	-114	225°		
-015	-115	150°		
-016	-116	75°		
-017	-117	0°	7	3
-019	-119	150°		



B
MOUNTING FLANGE
SHELL KEY
.84
.78
.675 MAX.
NUT
SEE DETAIL A
"O" RING
D
WRENCH FLATS
J
DIA
G
DETAIL A
SEE DETAILS FOR INSERT ARRANGEMENTS
.39
.36
MOUNTING HOLE "C" & THREAD
LOCKWASHER (SUPPLIED LOOSE)

TABLE II

SHELL SIZE	B ±.015	C +.020 -.005 & THREAD (REF.)	D ±.015		G ±.015	J ±.015	MAX ENGAGEMENT FORCE LBS	MIN ENGAGEMENT FORCE LBS
7	.875	.696 11/16-24 NEF-2	.875		.812	.692	20	3.75
12	1.062	.818 13/16-20UNEF-2	1.062		.938	.817	25	3.75
19	1.188	1.010 1-20UNEF-2	1.156		1.062	.942	35	3,75
27	1.312	1.135 1-1/8-18NEF-2	1.312		1.250	1.077	40	3.75
3	.750	.571 9/16-24NEF-2	.750		.625	.560	10	3.75

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Money DATE 2 Nov 64
CHECKED E.T. Dronsuko 2 Nov 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 15 Dec 64
NASA APPROVAL [illegible] 12/15/64
MIT APPROVAL
MIT APPROVAL W Cyplar 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006302
SCALE NONE	WT	SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 E

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR PUSH-PULL COUPLING, NUT MOUNTING, CLASS E SEAL, PIN OR SOCKET CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. PARTS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS OF MIL-C-26482

   E. MARKING:

      (1) PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.

      (2) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), SUPPLIER'S LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING.

   F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

2. ACCEPTANCE AND INSPECTION

   A. DIMENSIONS: AS DELINEATED HEREIN.

   B. ELECTRICAL CHARACTERISTICS WHEN TESTED USING CONTACTS PER ND 1010770.

      (1) INSULATION RESISTANCE: (MIL-STD-202, METHOD 302, CONDITION B)
      AT 25°C; 100,000 MEGOHMS MINIMUM AT 500 VDC
      AT 125°C; 5,000 MEGOHMS MINIMUM AT 500 VDC

      (2) DIELECTRIC WITHSTANDING VOLTAGE: (MIL-STD-202, METHOD 301)
      375 VRMS AT 70,000 FT ALTITUDE.1500 VRMS AT SEA LEVEL

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

      (1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.

      (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

   A. OPERATING LIFE (DURABILITY): 500 MINIMUM MATINGS AND UNMATINGS USING PLUG ND 1010771 AND CONTACTS PER ND 1010770.

   B. ELECTRICAL CHARACTERISTICS (RATINGS):

      (1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM

      (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC

      (3) CONTACT RESISTANCE: REAR OF PIN CONTACT CRIMP BARREL TO REAR OF SOCKET CONTACT CRIMP BARREL.
         (a) 7 MILLIVOLTS MAX AT 3 AMPERES
         (b) 20 MILLIVOLTS MAX AT 10 MILLIAMPERES

   C. MECHANICAL REQUIREMENTS:

      (1) COUPLING MECHANISM: BALL AND DETENT
      (2) ENGAGING & DISENGAGING FORCE: PER TABLE II
      (3) MOUNTING: SHALL MOUNT TO A .093 MAXIMUM PANEL
      (4) CONTACT RETENTION: 20 LBS MIN IN DIRECTION OF MATING FORCES
      (5) ALTITUDE IMMERSION, PER MIL-C-26500

   D. MATERIAL & FINISH

      (1) SHELL & HEX NUT ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482 WITH A CLEAR CONDUCTIVE ANODIZE (NON-OUTGASSING)
      (2) INSERT: SOLID DIELECTRIC PER MIL-C-26482 AND MIL-M-14 (TYPE MFH) OR EQUIVALENT. THIS MATERIALL SHALL BE NON-TOXIC OUTGASSING.
      (3) PANEL SEAL AND INSERT GROMMET: SILICONE RUBBER
      (4) LOCK WASHER: BRONZE (HEAT TREATED), NICKEL PLATED

   E. ACCESSORY PARTS:

      (1) MATING PLUGS: IN ACCORDANCE WITH ND 1010771.
      (2) CRIMP TYPE CONTACTS (100%, MIN, OF CONTACT CAVITIES) PER 1010770 AND APPLICABLE SEALING PLUGS (15%, MIN, OF CONTACT CAVITIES) PER 1010958 TO BE SUPPLIED WITH EACH UNIT. SEE TABLE I.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	~~INITIAL RELEASE CLASS A~~ PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK
D	REVISED PER TDRR 21587	8/31/65	WK
E	REVISED PER TDRR 22140	9/14	[illegible]

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTE

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Young DATE 28 OCT 64
CHECKED R.T. Dronsuke
APPROVAL
APPROVAL
APPROVAL Eldon C. Hall 15 Dec 64
NASA APPROVAL 12/15/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

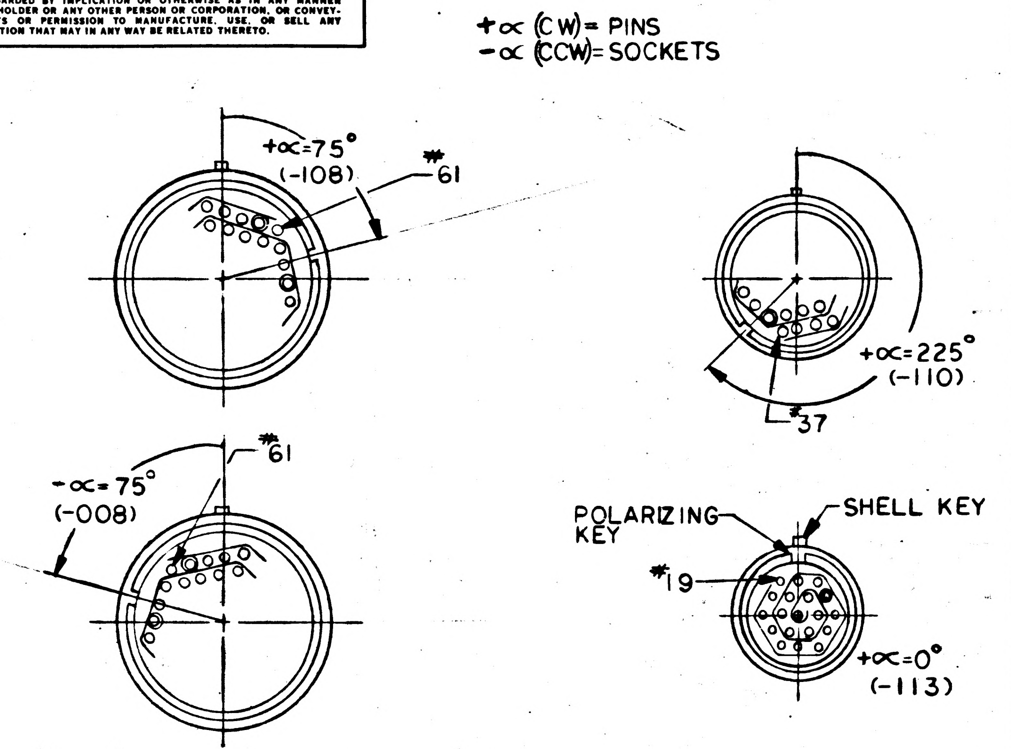
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL, MINIATURE, QUICK DISCONNECT SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006302
SCALE NONE	WT	SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 E


+∝ (CW)= PINS
−∝ (CCW)= SOCKETS
+∝=75° (−108)
#61
+∝=225° (−110)
#37
−∝=75° (−008)
#61
POLARIZING KEY
SHELL KEY
#19
+∝=0° (−113)

DETAILS –TYPICAL POLARIZATION

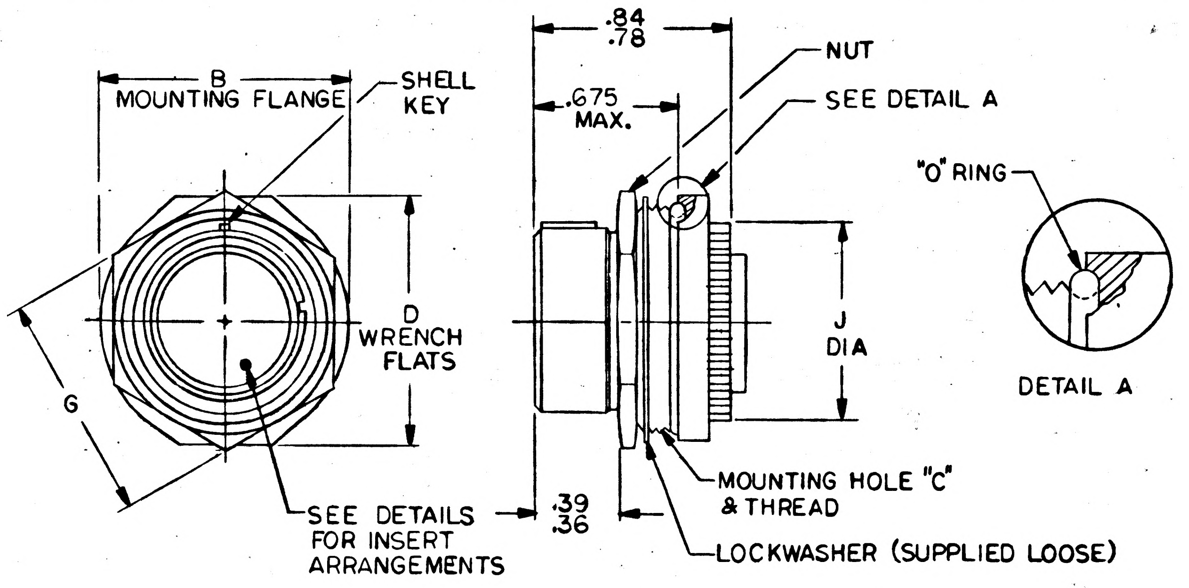

.84
.78
B
MOUNTING FLANGE
SHELL KEY
.675 MAX.
NUT
SEE DETAIL A
"O" RING
D
WRENCH FLATS
J
DIA
G
DETAIL A
MOUNTING HOLE "C" & THREAD
SEE DETAILS FOR INSERT ARRANGEMENTS
.39
.36
LOCKWASHER (SUPPLIED LOOSE)

TABLE I

DASH NO. (SOCKETS)	DASH NO. (PINS)	INSERT. POLARIZING ANGLE ± ∝	CONTACTS ACCOMODATED	SHELL SIZE TABLE II
-001	-101	0°	91	27
-002	-102	225°		
-003	-103	150°		
-004	-104	75°		
-005	-105	0°	61	19
-006	-106	225°		
-007	-107	150°		
-008	-108	75°		
-009	-109	0°	37	12
-010	-110	225°		
-011	-111	150°		
-012	-112	75°		
-013	-113	0°	19	7
-014	-114	225°		
-015	-115	150°		
-016	-116	75°		
-017	-117	0°	7	3
-019	-119	150°		

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK
D	REVISED PER TDRR 21587	8/3/65	WK
E	REVISED PER TDRR 22140	9/14	AL

TABLE II

SHELL SIZE	B ±.015	C +.020 −.005 & THREAD (REF.)	D ±.015		G ±.015	J ±.015	MAX	MIN
							ENGAGEMENT FORCE LBS	
7	.875	.696 11/16-24 NEF-2	.875		.812	.692	20	3.75
12	1.062	.818 13/16-20UNEF-2	1.062		.938	.817	25	3.75
19	1.188	1.010 1-20UNEF-2	1.156		1.062	.942	35	3,75
27	1.312	1.135 1-1/8-18NEF-2	1.312		1.250	1.077	40	3.75
3	.750	.571 9/16-24NEF-2	.750		.625	.560	10	3.75

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Money DATE 2 NOV 64
CHECKED E.T. Dronsuko 2 NOV 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 15 Dec 64
NASA APPROVAL 12/1/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006302
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 F

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR PUSH-PULL COUPLING, NUT MOUNTING, CLASS E SEAL, PIN OR SOCKET CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. PARTS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS OF MIL-C-26482

   E. MARKING:

      (1) PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.

      (2) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), SUPPLIER'S LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING.

   F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.

2. ACCEPTANCE AND INSPECTION

   A. DIMENSIONS: AS DELINEATED HEREIN.

   B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

      (1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.

      (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

   A. OPERATING LIFE (DURABILITY): 500 MINIMUM MATINGS AND UNMATINGS USING PLUG ND 1010771 AND CONTACTS PER ND 1010770.

   B. ELECTRICAL CHARACTERISTICS (RATINGS):

      (1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM.

      (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC.

      (3) CONTACT RESISTANCE: REAR OF PIN CONTACT CRIMP BARREL TO REAR OF SOCKET CONTACT CRIMP BARREL.
         (a) 7 MILLIVOLTS MAX AT 3 AMPERES.
         (b) 20 MILLIVOLTS MAX AT 10 MILLIAMPERES.

      (4) INSULATION RESISTANCE (MIL-STD-202, METHOD 302, CONDITION B): 100,000 MEGOHMS, MIN, AT +25°C AND 500 VDC; 5000 MEGOHMS, MIN, AT +125°C AND 500 VDC.

      (5) DIELECTRIC WITHSTANDING VOLTAGE (MIL-STD-202, METHOD 301): 1500 VRMS AT SEA LEVEL; 375 VRMS AT 70,000 FT.

   C. MECHANICAL REQUIREMENTS:

      (1) COUPLING MECHANISM: BALL AND DETENT (PUSH-PULL)

      (2) ENGAGING & DISENGAGING FORCE: PER TABLE II.

      (3) MOUNTING: SHALL MOUNT TO A .093 MAXIMUM PANEL.

      (4) CONTACT RETENTION: 20 LBS MIN IN DIRECTION OF MATING FORCES.

      (5) ALTITUDE IMMERSION, PER MIL-C-26500.

   D. MATERIAL & FINISH

      (1) SHELL & HEX NUT ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482 WITH A CLEAR CONDUCTIVE ANODIZE (NON-OUTGASSING)

      (2) INSERT: SOLID DIELECTRIC PER MIL-C-26482 AND MIL-M-14 (TYPE MFH) OR EQUIVALENT. THIS MATERIALL SHALL BE NON-TOXIC OUTGASSING.

      (3) PANEL SEAL AND INSERT GROMMET: SILICONE RUBBER

      (4) LOCK WASHER: BRONZE (HEAT TREATED), NICKEL PLATED

   E. ACCESSORY PARTS:

      (1) MATING PLUGS: IN ACCORDANCE WITH ND 1010771.

      (2) CRIMP TYPE CONTACTS (100%, MIN, OF CONTACT CAVITIES) PER 1010770 AND APPLICABLE SEALING PLUGS (15%, MIN, OF CONTACT CAVITIES) PER 1010958 TO BE SUPPLIED WITH EACH UNIT. SEE TABLE I.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	~~INITIAL RELEASE CLASS A~~ PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK
D	REVISED PER TDRR 21587	8/31/65	WK
E	REVISED PER TDRR 22140	9/14	MZM
F	REVISED PER TDRR 28429	5-10-66	MZM

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Young DM DATE 28 OCT 64
CHECKED R.T. Dronsuko 2 Nov 64
APPROVAL
APPROVAL
APPROVAL Eilene Hall 15 Dec 64
NASA APPROVAL 12/15/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

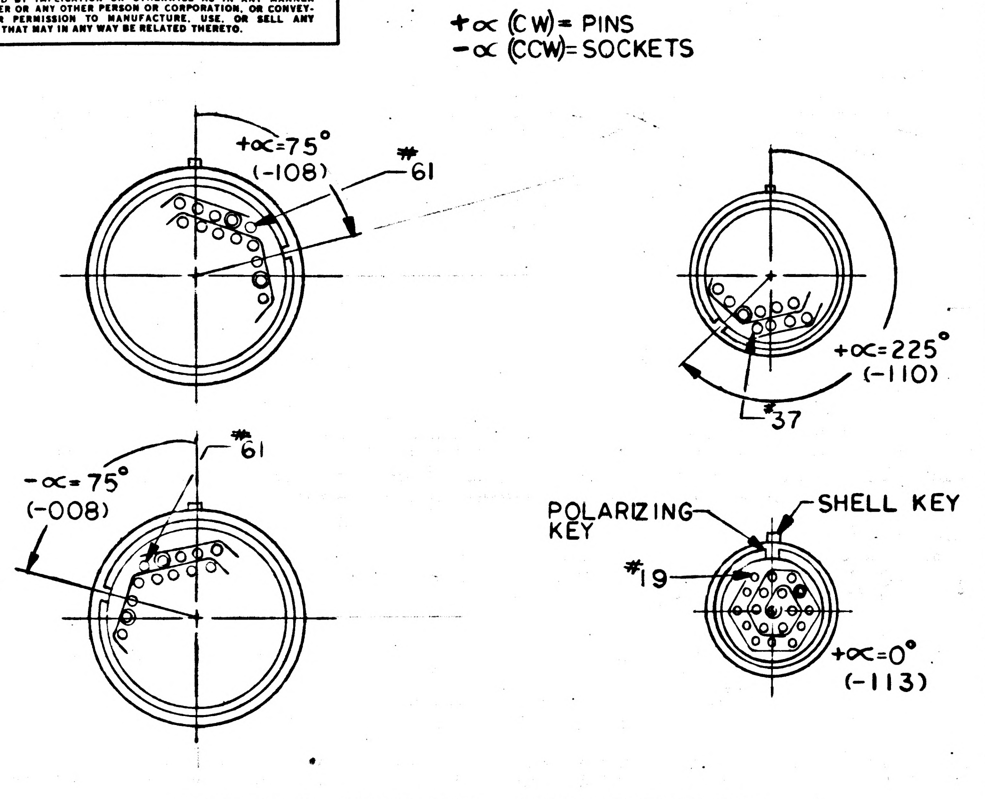
CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006302

SCALE NONE WT SHEET 1 OF 2

1006302 F

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	
A	REVISED PER TDRR 16048	2/5/65	WK
B	REVISED PER TDRR 16566	2/24/65	WK
C	REVISED PER TDRR 16802	4/1/65	WK
D	REVISED PER TDRR 21587	8/3/65	WK
E	REVISED PER TDRR 22140	9/14	[illegible]
F	REVISED PER TDRR 28429	5-10-66	[illegible]

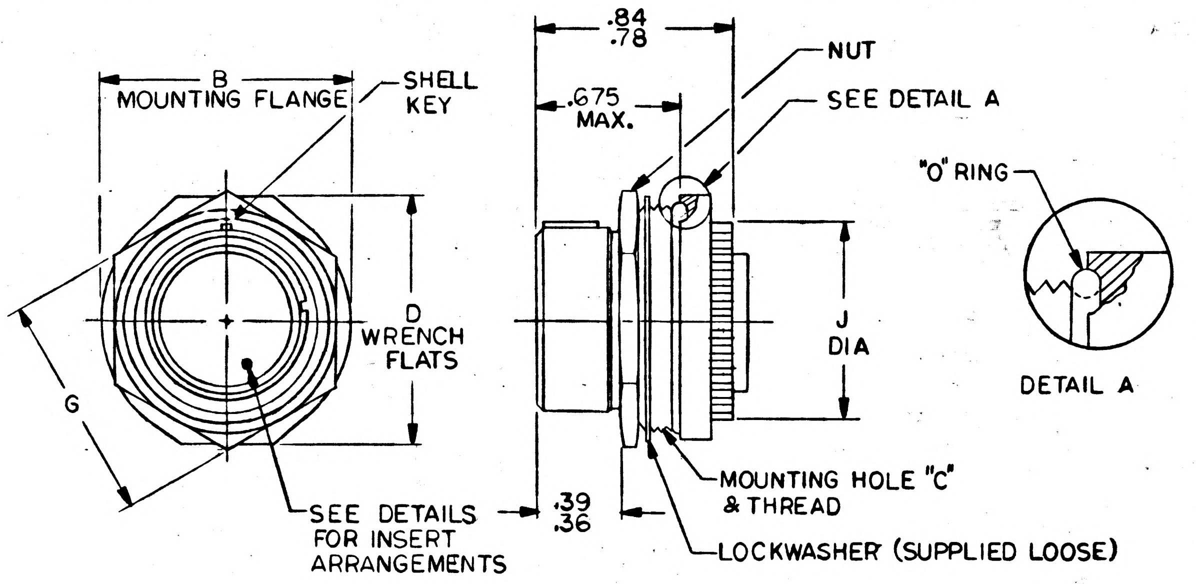


+∝ (CW)= PINS
-∝ (CCW)= SOCKETS
+∝=75°
(-108)
#61
+∝=225°
(-110)
#37
-∝=75°
(-008)
#61
POLARIZING KEY
SHELL KEY
#19
+∝=0°
(-113)

DETAILS –TYPICAL POLARIZATION

TABLE I

DASH NO. (SOCKETS)	DASH NO. (PINS)	INSERT POLARIZING ANGLE ± ∝	CONTACTS ACCOMODATED	SHELL SIZE TABLE II
-001	-101	0°	91	27
-002	-102	225°		
-003	-103	150°		
-004	-104	75°		
-005	-105	0°	61	19
-006	-106	225°		
-007	-107	150°		
-008	-108	75°		
-009	-109	0°	37	12
-010	-110	225°		
-011	-111	150°		
-012	-112	75°		
-013	-113	0°	19	7
-014	-114	225°		
-015	-115	150°		
-016	-116	75°		
-017	-117	0°	7	3
-019	-119	150°		



B
MOUNTING FLANGE
SHELL KEY
D
WRENCH FLATS
G
SEE DETAILS FOR INSERT ARRANGEMENTS
.84
.78
.675 MAX.
NUT
SEE DETAIL A
J DIA
.39
.36
MOUNTING HOLE "C" & THREAD
LOCKWASHER (SUPPLIED LOOSE)
"O" RING
DETAIL A

TABLE II

SHELL SIZE	B ±.015	C +.020 -.005 & THREAD (REF.)	D ±.015		G ±.015	J ±.015	MAX ENGAGEMENT FORCE LBS	MIN ENGAGEMENT FORCE LBS
7	.875	.696 11/16-24 NEF-2	.875		.812	.692	20	3.75
12	1.062	.818 13/16-20UNEF-2	1.062		.938	.817	25	3.75
19	1.188	1.010 1-20UNEF-2	1.156		1.062	.942	35	3,75
27	1.312	1.135 1-1/8-18NEF-2	1.312		1.250	1.077	40	3.75
3	.750	.571 9/16-24NEF-2	.750		.625	.560	10	3.75

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Money DATE 2 Nov 64
CHECKED R.T. Dronsuk 2 Nov 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 15 Dec 64
NASA APPROVAL [illegible] 12/15/64
MIT APPROVAL
MIT APPROVAL W [illegible] 15 Dec 64

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HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006302
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 —

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR PUSH-PULL COUPLING, NUT MOUNTING, CLASS E SEAL, PIN OR SOCKET CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002052.

   E. MARKING:

      (1) PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.

      (2) PACKAGES: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), SUPPLIER'S LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING.

   F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

2. ACCEPTANCE AND INSPECTION

   A. DIMENSIONS: AS DELINEATED HEREIN.

   B. ELECTRICAL CHARACTERISTICS WHEN TESTED USING CONTACTS PER ND 1010770.

      (1) INSULATION RESISTANCE: (MIL-STD-202, METHOD 302, CONDITION B)
      AT 25°C; 100,000 MEGOHMS MINIMUM AT 500 VDC
      AT 125°C; 5,000 MEGOHMS MINIMUM AT 500 VDC

      (2) DIELECTRIC WITHSTANDING VOLTAGE: (MIL-STD-202, METHOD 301)
      375 VRMS AT 70,000 FT ALTITUDE.1500 VRMS AT SEA LEVEL

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

      (1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.

      (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

   A. OPERATING LIFE (DURABILITY): 500 MINIMUM MATINGS AND UNMATINGS USING PLUG ND 1010771 AND CONTACTS PER ND 1010770.

   B. ELECTRICAL CHARACTERISTICS (RATINGS):

      (1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM
      (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC
      (3) CONTACT RESISTANCE: 7 MILLIVOLTS AT 3 AMPERES

   C. MECHANICAL REQUIREMENTS:

      (1) COUPLING MECHANISM: BALL AND DETENT
      (2) ENGAGING & DISENGAGING FORCE: PER TABLE I
      (3) MOUNTING: SHALL MOUNT TO A .093 MAXIMUM PANEL.
      (4) CONTACT RETENTION: 50 LBS MIN, BOTH DIRECTIONS
      (5) ALTITUDE IMMERSION, PER MIL-C-26500

   D. MATERIAL & FINISH

      (1) SHELL & HEX NUT ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482 WITH A CLEAR CONDUCTIVE ANODIZE (NON-OUTGASSING)
      (2) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH
      (3) PANEL SEAL AND INSERT GROMMET: SILICONE RUBBER
      (4) LOCK WASHER: BRONZE (HEAT TREATED) GOLD PLATED PER MIL-G-45204, 5 MICRO INCHES MIN

   E. ACCESSORY PARTS:

      (1) MATING PLUGS: IN ACCORDANCE WITH ND 1010771.
      (2) CONTACT PINS & SOCKETS: IN ACCORDANCE WITH ND 1010770. (SEE TABLE I)

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Young DM DATE 28 OCT 64
CHECKED R.T. Dronsuk 2NOV64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 15 Dec 64
NASA APPROVAL 12/15/64
MIT APPROVAL
MIT APPROVAL 15 Dec 64

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CONNECTOR, RECEPTACLE, ELECTRICAL,
MINIATURE, QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006302
SCALE NONE WT SHEET 1 OF 2

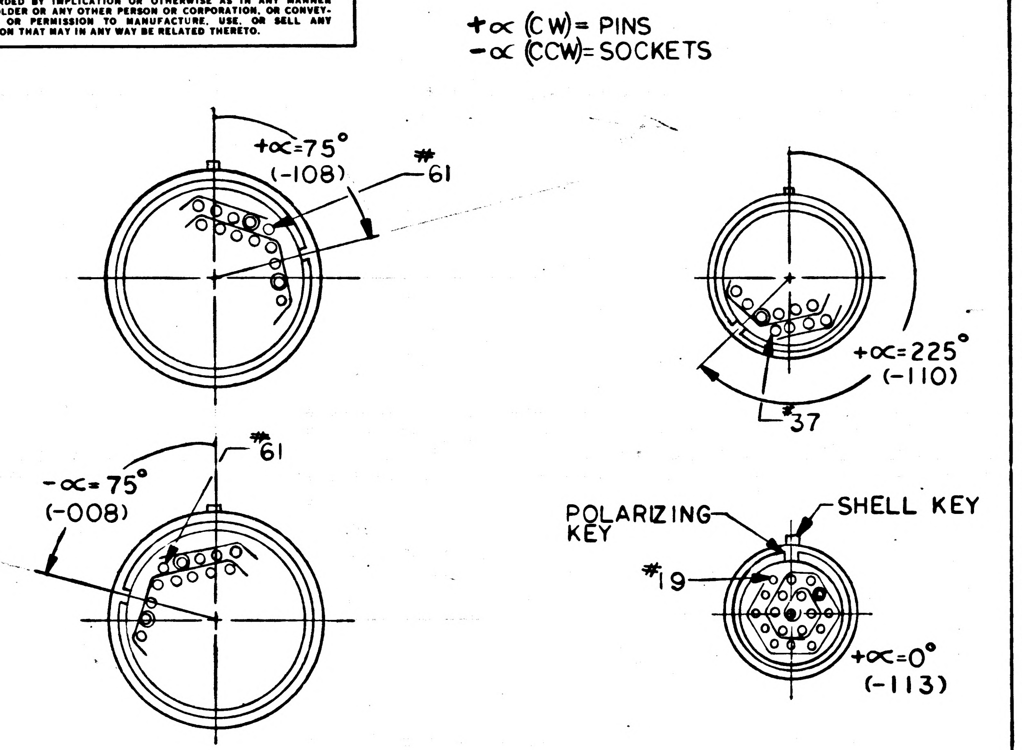
INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006302 | —

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 14833	12-15-64	


+∝ (CW) = PINS
−∝ (CCW) = SOCKETS
+∝=75°
(-108)
#61
+∝=225°
(-110)
#37
−∝=75°
(-008)
#61
POLARIZING KEY
SHELL KEY
#19
+∝=0°
(-113)

DETAILS – TYPICAL POLARIZATION

TABLE I

DASH NO. (SOCKETS)	DASH NO. (PINS)	INSERT POLARIZING ANGLE ± ∝	CONTACTS ACCOMODATED	SHELL SIZE TABLE II
-001	-101	0°	91	27
-002	-102	225°		
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-004	-104	75°		
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-011	-111	150°		
-012	-112	75°		
-013	-113	0°	19	7
-014	-114	225°		
-015	-115	150°		
-016	-116	75°		

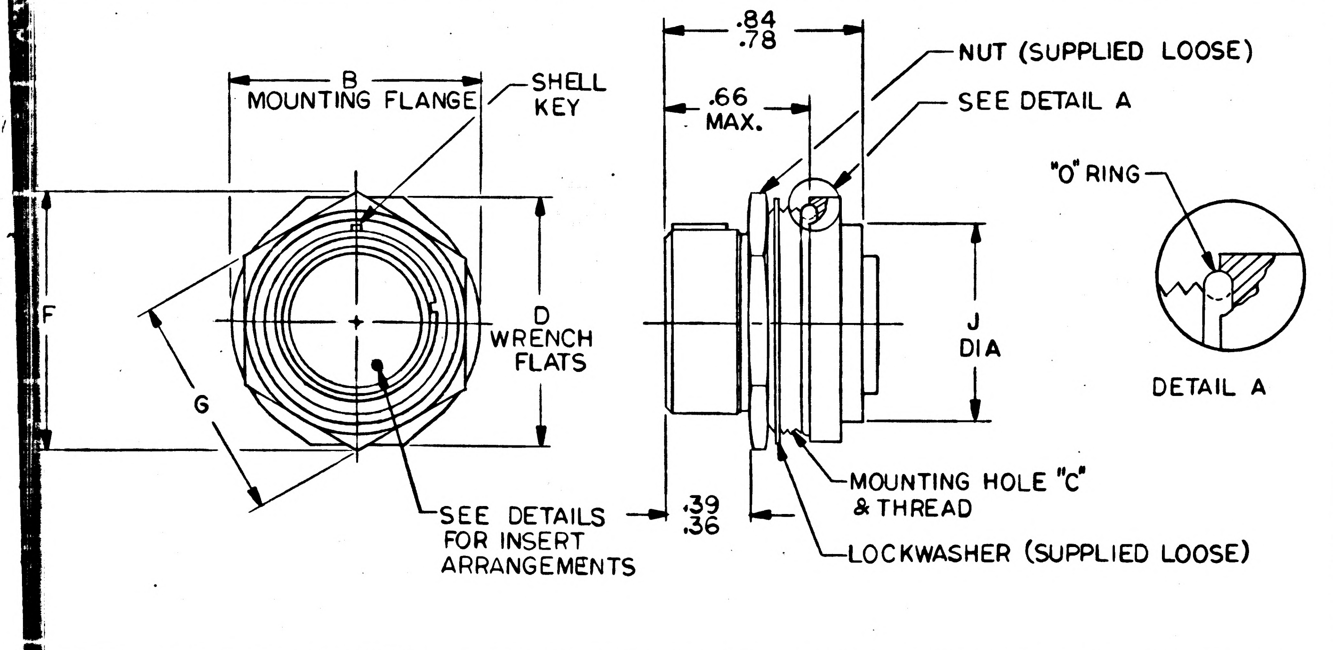
B
MOUNTING FLANGE
SHELL KEY
F
D
WRENCH FLATS
G
SEE DETAILS FOR INSERT ARRANGEMENTS
.84
.78
.66
MAX.
NUT (SUPPLIED LOOSE)
SEE DETAIL A
J
DIA
MOUNTING HOLE "C" & THREAD
LOCKWASHER (SUPPLIED LOOSE)
.39
.36
"O" RING
DETAIL A

TABLE II

SHELL SIZE	B ±.015	C +.020 −.005 & THREAD (REF.)	D ±.015	F ±.015	G ±.015	J ±.015	MAX ENGAGEMENT FORCE LBS	MIN ENGAGEMENT FORCE LBS
19	.875	.696 11/16-24 NEF-2	.875	.938	.812	.688	35	3.75
12	1.062	.818 13/16-20UNEF-2	1.062	1.083	.938	.812	25	3.75
7	1.188	1.010 1-20UNEF-2	1.156	1.227	1.062	.938	20	3,75
27	1.312	1.135 1-1/8-18NEF-2	1.312	1.443	1.250	1.062	40	3.75

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FI N

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTE

M I T
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CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Money J. M. DATE 2 Nov 64
CHECKED R.T. Dronsuko 2 Nov 64
APPROVAL
APPROVAL
APPROVAL Ellen C Hall 15 Dec 64
NASA APPROVAL 12/15/64
MIT APPROVAL
MIT APPROVAL W Cypher 15 Dec 64

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HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL, MINIATURE, QUICK DISCONNECT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006302
SCALE NONE	WT	SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

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— 1006303

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15507	1-13-65	WK.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. THE VARNISH SPECIFIED HEREIN SHALL BE A CELLULOSIC LACQUER WHICH CONFORMS TO THE REQUIREMENTS OF MIL-I-17384A, TYPE G, AND AS SPECIFIED BELOW.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTITY, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING. FLAMMABILITY AND TOXICITY WARNINGS SHALL BE MARKED.

E. PACKAGING AND PACKING: UNIT PACKAGING SHALL BE IN ACCORDANCE WITH THE SUPPLIER'S NORMAL COMMERCIAL PRACTICE. SHIPPING CONTAINERS SHALL BE OF THE TYPE, SIZE AND KIND COMMONLY USED FOR THE PURPOSE IN A MANNER THAT WILL INSURE ACCEPTANCE BY COMMON CARRIER AND SAFE DELIVERY AT DESTINATION. SHIPPING CONTAINERS SHALL COMPLY WITH THE UNIFORM FREIGHT CLASSIFICATION RULES OR REGULATIONS OF OTHER CARRIERS, AS APPLICABLE TO THE MODE OF TRANSPORTATION.

ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES:

(1) COLOR: CLEAR COLORLESS

(2) SPECIFIC GRAVITY (60°/60°F): 22°-24° API GRAVITY (.91-.92 G /CC) ASTM D287-55.

(3) VISCOSITY (AT 77°F): 12-20 SECONDS FOR GARDNER-HOLDT BUBBLE TUBE PER FED-STD-141, METHOD 4271. (700 TO 1350 CPS)

(4) AIR DRYING TIME: 15 MINUTES MAXIMUM.

(5) FLASH POINT: 60°F MINIMUM.

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC STRENGTH (DRY): 1500 VOLTS/MIL (60 CPS RMS PER ASTM D115-55)

(2) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM

DESIGN:

A. ELECTRICAL RATINGS:

(1) DIELECTRIC STRENGTH (AFTER 24 HOUR IMMERSION): 800 VOLTS/MIL (60 CPS RMS PER ASTM D115-55)

B. CHEMICAL RESISTANCE: ACID, WATER, AND OILPROOF.

C. STORAGE LIFE: ONE YEAR MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL CONTAINERS AT TEMPERATURES BELOW 80°F.

D. VISCOSITY ADJUSTMENT: THIS LACQUER MAY BE THINNED USING TOLUENE OR OTHER SUITABLE CELLULOSIC LACQUER SOLVENTS.

E. MATERIALS COMPATIBILITY: ONLY THESE MATERIALS/COMPOSITIONS/COMPOSITES FOUND TO BE NONTOXIC AND NONCOMBUSTABLE WHEN TESTED PER ND1002251 AND ND1002252 SHALL BE APPROVED.

F. FUNGUS RESISTANCE: MATERIALS SHALL NOT SUPPORT FUNGUS WHEN TESTED PER ND1002253.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

E ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Honey DMS DATE 4 NOV 64
CHECKED R.T. [illegible] 5 NOV 64
APPROVAL [illegible] 3 Dec 64
APPROVAL
APPROVAL Eldon C. Hall 11 Jan 65
NASA APPROVAL W J Rhine 1-13-65
MIT APPROVAL
MIT APPROVAL [illegible] 13 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATING VARNISH,
ELECTRICAL, QUICK DRYING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006303
SCALE NONE
WT
SHEET 1 OF 1

4 3 2 1

1006304 A

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS		15506	
—	INITIAL RELEASE CLASS A PER TDRR 15506	1/13/65	WK
A	REVISED PER TDRR 19725	8/Jul 65	WK

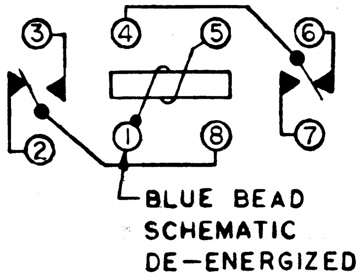
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

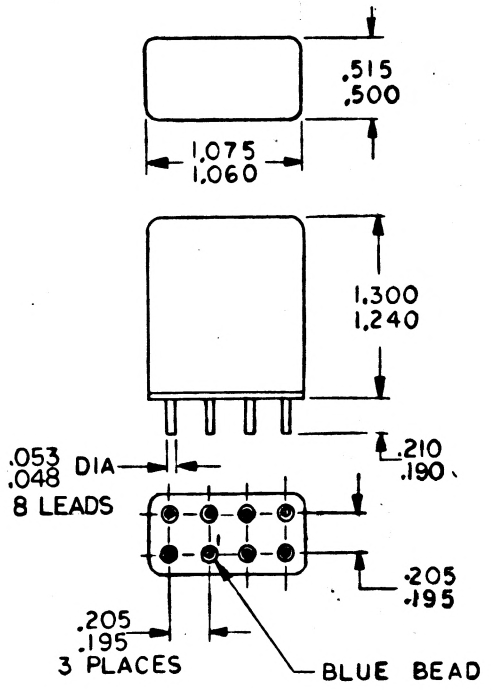
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046.
   - E. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
2. ACCEPTANCE AND INSPECTION:
   - A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.
   - B. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: LEAD MATERIAL SHALL BE PER TABLE I A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT. THE COMPONENT LEAD SHALL BE UNIFORM IN QUALITY AND TEMPER, CLEAN, SOUND, SMOOTH, AND FREE FROM INJURIOUS FOREIGN MATERIAL, SCRAPES, COLD SHUTS, LAPS, CRACKS, TWISTS, SCALE, DAMAGED ENDS, WELDS, SCORES, PITS, GALLS, AND OTHER DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE. LEADS SHALL HAVE NO BENDS WITHIN .06 OF HEADER SEAL.
     - (2) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING: NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER; DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR); DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE; MUST OPERATE CURRENT, MAXIMUM; SCHEMATIC DIAGRAM; BLUE BEADING AROUND TERMINAL 1.
       - (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.
     - (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. LEADS SHALL BE SYMMETRICALLY POSITIONED WITH RESPECT TO ℄ OF HEADER WITHIN .010 INCH.
     - (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III (EXCEPT 10^{-8} CC/SEC) PER MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) COIL CURRENT: PULL-IN AND DROP-OUT IN ACCORDANCE WITH TABLE I.
     - (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.
     - (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.
     - (4) DIELECTRIC STRENGTH:
       - (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS ~~MINIMUM~~ WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.
     - (6) OPERATE AND RELEASE TIME: EACH 7 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I, WHEN TESTED PER THE APPLICABLE CIRCUIT OF MIL-R-5757.
     - (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.
     - (8) CONTACT BOUNCE: 2.0 MILLISECONDS MAXIMUM.
     - (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.
   - D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF ANALYSIS FOR LEAD MATERIAL
     - (2) CERTIFICATE OF COMPLIANCE TO ND 1015404, CLASS 2.
     - (3) CERTIFICATE OF COMPLIANCE WITH 100% MISS TEST.
     - (4) CERTIFIED TEST DATA (FOR EACH RELAY) OF MISS TEST.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR REFERENCE ONLY





-001 CONFIGURATION

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Yonaz DATE 5 Nov 64
CHECKED R.T. Dromiaks 9 Nov 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 11 Jan 65
NASA APPROVAL WJ Rhine 1-13-65
MIT APPROVAL
MIT APPROVAL W Kupfer 13 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(13 AMP)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006304
SCALE NONE	WT	SHEET 1 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006304 A

REVISIONS 15506			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15506	1/13/65	WK
A	REVISED PER TDRR 19725	8 Jul 65	WK.

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 2.2 WATTS MAXIMUM AT PLUS 25 DEGREES CENTIGRADE DERATED TO 1.4 WATT AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 13 AMPERES AT 3 VOLTS DC OR 10 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY) IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE) DOUBLE POLE, DOUBLE THROW.

(2) CONTACT MATERIAL: SILVER-MAGNESIUM-NICKEL ALLOY, GOLD PLATED.

(3) CASE MATERIAL: CUPRO NICKEL

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

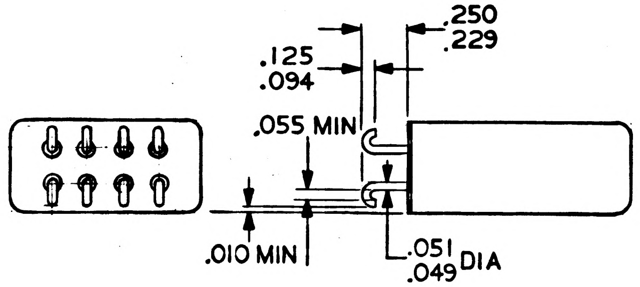
(5) OCCURANCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CONTACT RESISTANCE AND MAXIMUM PULL-IN CURRENT, SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5,000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1, 3, 6, 7, 8 FOR EACH RELAY TAKEN BEFORE AND AFTER MISS TEST SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RESISTANCE OHMS @ 25°C MIN - MAX	PULL-IN CURRENT MADC MAX POSITIVE	CONTINUOUS CURRENT @ 125°C MADC MAX	SUGGESTED SOURCE VOLTAGE VDC	OPERATE SENSITIVITY MW NOM.	DROP-OUT CURRENT MADC MIN POSITIVE	LEAD MATERIAL
-001	65 ± 10%	88.0	176	12.0	500	8.8	DUMET PER PS1015401
-002	65±10%	88.0	176	12.0	500	8.8	CORE: COPPER 22% OF TOTAL VOLUME. SLEEVE: NICKEL-42%, CHROME-6% IRON-52%



-002 LEAD CONFIGURATION

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Morse DATE 5 NOV 64
CHECKED R.T. Dronsuko 9 NOV 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 11 Jan 65
NASA APPROVAL W.J. Rhine 1-13-65
MIT APPROVAL
MIT APPROVAL W Kupfer 13 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(13 AMP)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006304
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006304 B

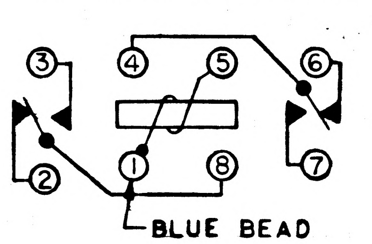
REVISIONS 15506			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15506	1/13/65	WK
A	REVISED PER TDRR 19725	8 Jul 65	WK
B	REVISED PER TDRR 24267	11/30/65	WK

NOTES:

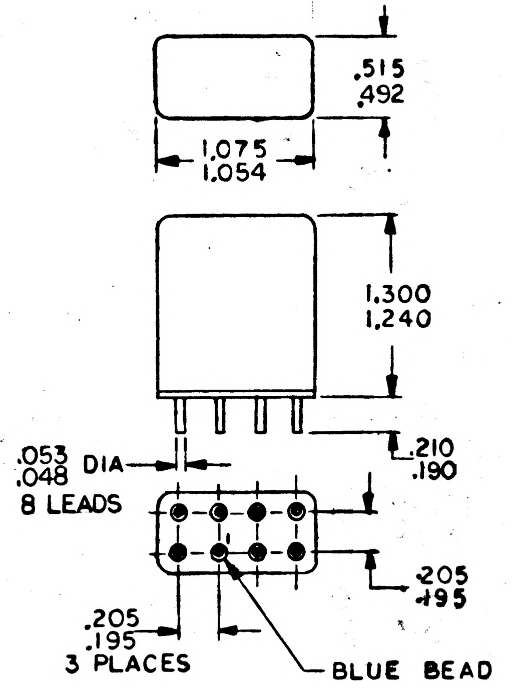
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046.
   - E. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
2. ACCEPTANCE AND INSPECTION:
   - A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.
   - B. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: LEAD MATERIAL SHALL BE PER TABLE I A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT. THE COMPONENT LEAD SHALL BE UNIFORM IN QUALITY AND TEMPER, CLEAN, SOUND, SMOOTH, AND FREE FROM INJURIOUS FOREIGN MATERIAL, SCRAPES, COLD SHUTS, LAPS, CRACKS, TWISTS, SCALE, DAMAGED ENDS, WELDS, SCORES, PITS, GALLS, AND OTHER DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE. LEADS SHALL HAVE NO BENDS WITHIN .06 OF HEADER SEAL.
     - (2) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING: NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER; DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR); DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE; MUST OPERATE CURRENT, MAXIMUM; SCHEMATIC DIAGRAM; BLUE BEADING AROUND TERMINAL 1.
       - (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.
     - (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. LEADS SHALL BE SYMMETRICALLY POSITIONED WITH RESPECT TO ℄ OF HEADER WITHIN .010 INCH.
     - (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III (EXCEPT 10^{-8} CC/SEC) PER MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) COIL CURRENT: PULL-IN AND DROP-OUT IN ACCORDANCE WITH TABLE I.
     - (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.
     - (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.
     - (4) DIELECTRIC STRENGTH:
       - (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS ~~MINIMUM~~ WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.
     - (6) OPERATE AND RELEASE TIME: EACH 7 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I, WHEN TESTED PER THE APPLICABLE CIRCUIT OF MIL-R-5757.
     - (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.
     - (8) CONTACT BOUNCE: 2.0 MILLISECONDS MAXIMUM.
     - (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.
   - D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF ANALYSIS FOR LEAD MATERIAL
     - (2) CERTIFICATE OF COMPLIANCE TO ND 1015404, CLASS 2.
     - (3) CERTIFICATE OF COMPLIANCE WITH 100% MISS TEST.
     - (4) CERTIFIED TEST DATA (FOR EACH RELAY) OF MISS TEST.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR REFERENCE ONLY



SCHEMATIC
DE-ENERGIZED



-001 CONFIGURATION

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. [illegible] DATE 5 Nov 64
CHECKED R.T. [illegible] 9 Nov 64
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 11 Jan 65
NASA APPROVAL W.J. [illegible] 1-13-65
MIT APPROVAL
MIT APPROVAL W K[illegible] for 1/13/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(13 AMP)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006304
SCALE NONE	WT	SHEET 1 OF 2

MASTER

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1006304 B

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS 15506		
—	INITIAL RELEASE CLASS A PER TDRR 15506	1/13/65	WK
A	REVISED PER TDRR 19725	8 June 65	WK.
B	REVISED PER TDRR 24267	11/30/65	WK

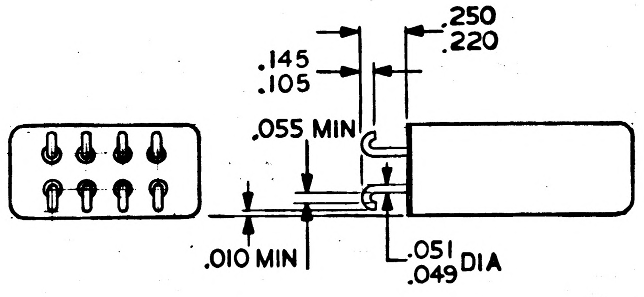
NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:
   - A. ELECTRICAL RATINGS:
     - (1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.
     - (2) COIL POWER: 2.2 WATTS MAXIMUM AT PLUS 25 DEGREES CENTIGRADE DERATED TO 1.4 WATT AT PLUS 125 DEGREES CENTIGRADE.
     - (3) CONTACT RATING (PER POLE): 13 AMPERES AT 3 VOLTS DC OR 10 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.
     - (4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.
     - (5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.
     - (6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.
     - (7) COIL PULL-IN POWER (SENSITIVITY) IN ACCORDANCE WITH TABLE I.
     - (8) DIELECTRIC STRENGTH:
       - (a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
   - B. CONSTRUCTION:
     - (1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE) DOUBLE POLE, DOUBLE THROW.
     - (2) CONTACT MATERIAL: SILVER-MAGNESIUM-NICKEL ALLOY, GOLD PLATED.
     - (3) CASE MATERIAL: CUPRO NICKEL
   - C. QUALIFICATION REQUIREMENTS:
     - (1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.
   - D. ENVIRONMENTAL REQUIREMENTS:
     - (1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.
     - (2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.
     - (3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.
     - (4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:
   - A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:
     - (1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.
     - (2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.
     - (3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.
     - (4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.
     - (5) OCCURANCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.
     - (6) CONTACT RESISTANCE AND MAXIMUM PULL-IN CURRENT, SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5,000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.
     - (7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1, 3, 6, 7, 8 FOR EACH RELAY TAKEN BEFORE AND AFTER MISS TEST SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RESISTANCE OHMS @ 25°C MIN - MAX	PULL-IN CURRENT MADC MAX POSITIVE	CONTINUOUS CURRENT @ 125°C MADC MAX	SUGGESTED SOURCE VOLTAGE VDC	OPERATE SENSITIVITY MW NOM.	DROP-OUT CURRENT MADC MIN POSITIVE	LEAD MATERIAL
-001	65 ± 10%	88.0	176	12.0	500	8.8	DUMET PER PS1015401
-002	65±10%	88.0	176	12.0	500	8.8	CORE: COPPER 22% OF TOTAL VOLUME. SLEEVE: NICKEL-42%, CHROME-6% IRON-52%



-002 LEAD CONFIGURATION

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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APPROVAL Eldon C Hall 11 Jan 65
NASA APPROVAL 1-13-65
MIT APPROVAL
MIT APPROVAL 13 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(13 AMP)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006304
SCALE NONE
WT
SHEET 2 OF 2

— 1006304

REVISIONS 15506			
SYM	DESCRIPTION	DATE	APPROV
—	INITIAL RELEASE CLASS A PER TDRR 15506	1/13/65	WK

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NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046.

E. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

F. PREPARATION FOR DELIVERY: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL: LEAD MATERIAL SHALL BE GOLD PLATED IRON-NICKEL ALLOY (DUMET) IN ACCORDANCE WITH ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT. THE COMPONENT LEAD SHALL BE UNIFORM IN QUALITY AND TEMPER, CLEAN, SOUND, SMOOTH, AND FREE FROM INJURIOUS FOREIGN MATERIAL, SCRAPES, COLD SHUTS, LAPS, CRACKS, TWISTS, SCALE, DAMAGED ENDS, WELDS, SCORES, PITS, GALLS, AND OTHER DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE. LEADS SHALL HAVE NO BENDS WITHIN .06 OF HEADER SEAL.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING: NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER; DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR); DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE; MUST OPERATE CURRENT, MAXIMUM; SCHEMATIC DIAGRAM; BLUE BEADING AROUND TERMINAL 1.

(b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.

(3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. LEADS SHALL BE SYMMETRICALLY POSITIONED WITH RESPECT TO ℄ OF HEADER WITHIN .010 INCH.

(4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III (EXCEPT 10^{-8} CC/SEC) PER MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

C. ELECTRICAL REQUIREMENTS:

(1) COIL CURRENT: PULL-IN AND DROP-OUT IN ACCORDANCE WITH TABLE I.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH:

(a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS ~~MINIMUM~~ WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.

(5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

(6) OPERATE AND RELEASE TIME: EACH 7 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I, WHEN TESTED PER THE APPLICABLE CIRCUIT OF MIL-R-5757.

(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

(8) CONTACT BOUNCE: 2.0 MILLISECONDS MAXIMUM.

(9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF ANALYSIS FOR LEAD MATERIAL

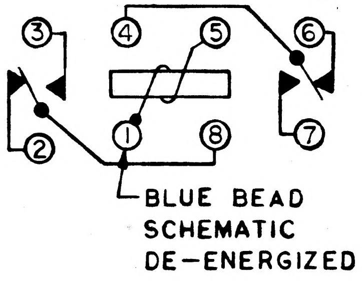
(2) CERTIFICATE OF COMPLIANCE TO ND 1015404, CLASS 2.

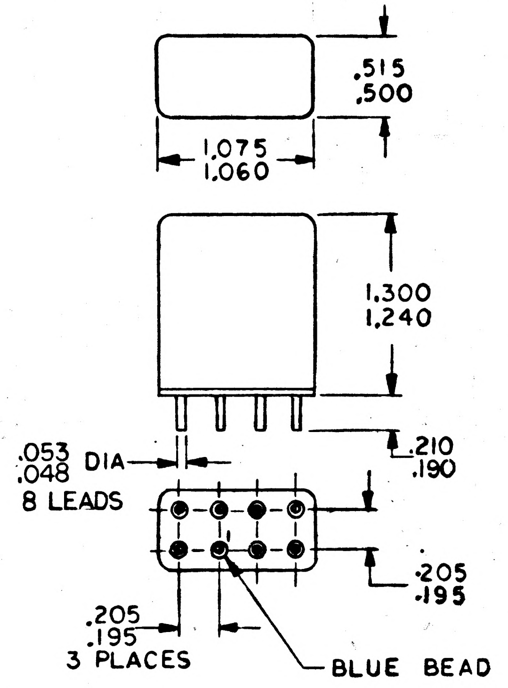
(3) CERTIFICATE OF COMPLIANCE WITH 100% MISS TEST.

(4) CERTIFIED TEST DATA (FOR EACH RELAY) OF MISS TEST.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR REFERENCE ONLY





MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIN NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
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APPROVAL Eldon C Hall 11 Jan 65
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RELAY, ARMATURE
(13 AMP)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006304
SCALE NONE	WT	SHEET 1 OF 2

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—	1006304

REVISIONS 15506			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15506	1/12/65	WK

NOTES (CONTINUED)

. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 2.2 WATTS MAXIMUM AT PLUS 25 DEGREES CENTIGRADE DERATED TO 1.4 WATT AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 13 AMPERES AT 3 VOLTS DC OR 10 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY) IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE) DOUBLE POLE, DOUBLE THROW.

(2) CONTACT MATERIAL: SILVER-MAGNESIUM-NICKEL ALLOY, GOLD PLATED.

(3) CASE MATERIAL: CUPRO NICKEL

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURANCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CONTACT RESISTANCE AND MAXIMUM PULL-IN CURRENT, SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5,000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1, 3, 6, 7, 8 FOR EACH RELAY TAKEN BEFORE AND AFTER MISS TEST SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RESISTANCE OHMS @ 25°C MIN - MAX	PULL-IN CURRENT MADC MAX POSITIVE	CONTINUOUS CURRENT @ 125°C MADC MAX	SUGGESTED SOURCE VOLTAGE VDC	OPERATE SENSITIVITY MW NOM.	DROP-OUT CURRENT MADC MIN POSITIVE
-001	65 ± 10%	88.0	176	12.0	500	8.8

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIN NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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APPROVAL Eldon C Hall 11 Jan 65
NASA APPROVAL WJ Rhine 1-13-65
MIT APPROVAL
MIT APPROVAL W Kupfer 13 Jan 65

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RELAY, ARMATURE
(13 AMP)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006304
SCALE NONE
WT
SHEET 2 OF 2

1006310 A

SYM	DESCRIPTION	DATE	APPROVAL
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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500/290 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. MARKING:

(1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6310). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL. A LEAKAGE RATE OF 1 X 10^{-8} CC-ATM-SEC OR GREATER SHALL CONSTITUTE A FAILURE.

ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

(1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

(2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

COLLECTOR CUTOFF CURRENT
COLLECTOR-BASE BREAKDOWN VOLTAGE
EMITTER-BASE BREAKDOWN VOLTAGE
EMITTER-BASE REVERSE CURRENT
COLLECTOR-EMITTER SUSTAINING VOLTAGE
COLLECTOR-EMITTER CURRENT
COLLECTOR-EMITTER THRESHOLD CURRENT
DIRECT CURRENT GAIN
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE
COLLECTOR CAPACITANCE
TURN-ON AND TURN-OFF TIME

(3) QUALITY DEMONSTRATION TESTING: PER TABLE III ON LOTS MORE THAN 500 UNITS USING ACCEPTABLE UNITS FROM SUBGROUP 2 OF TABLE II FOR SUBGROUP 2, 3, AND 4 OF TABLE III. SUBGROUPS 1 AND 5 MAY USE ELECTRICAL REJECTS FROM THE SAME LOT.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH PARA.2.C(1) OR 2.C(3). UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED UNDER SEPARATE COVER WITH TEST DATA FOR EACH LOT SHIPMENT.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +200°C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

(1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 40 VDC

(2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC

(3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC

(4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES

(5) POWER DISSIPATION (P_T): 0.4 WATTS AT 25°C AMBIENT TEMPERATURE
1.8 WATTS AT 25°C CASE TEMPERATURE

(6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT

(7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 485 °C/WATT

(8) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.

(9) TEMPERATURE RANGE, STORAGE: -65°C TO +300°C

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL PNP

(2) CASE: METAL CAN AND METAL HEADER, HERMETICALLY SEALED (JEDEC TO-18)

(3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

(4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:

(1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

CURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

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CHECKED R.T. WBM 9DEC64
APPROVAL
APPROVAL Ellen C Hall 22Jan65
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 26Jan65

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HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 1 OF 4

15737

A 1006310

SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	[illegible]	WK

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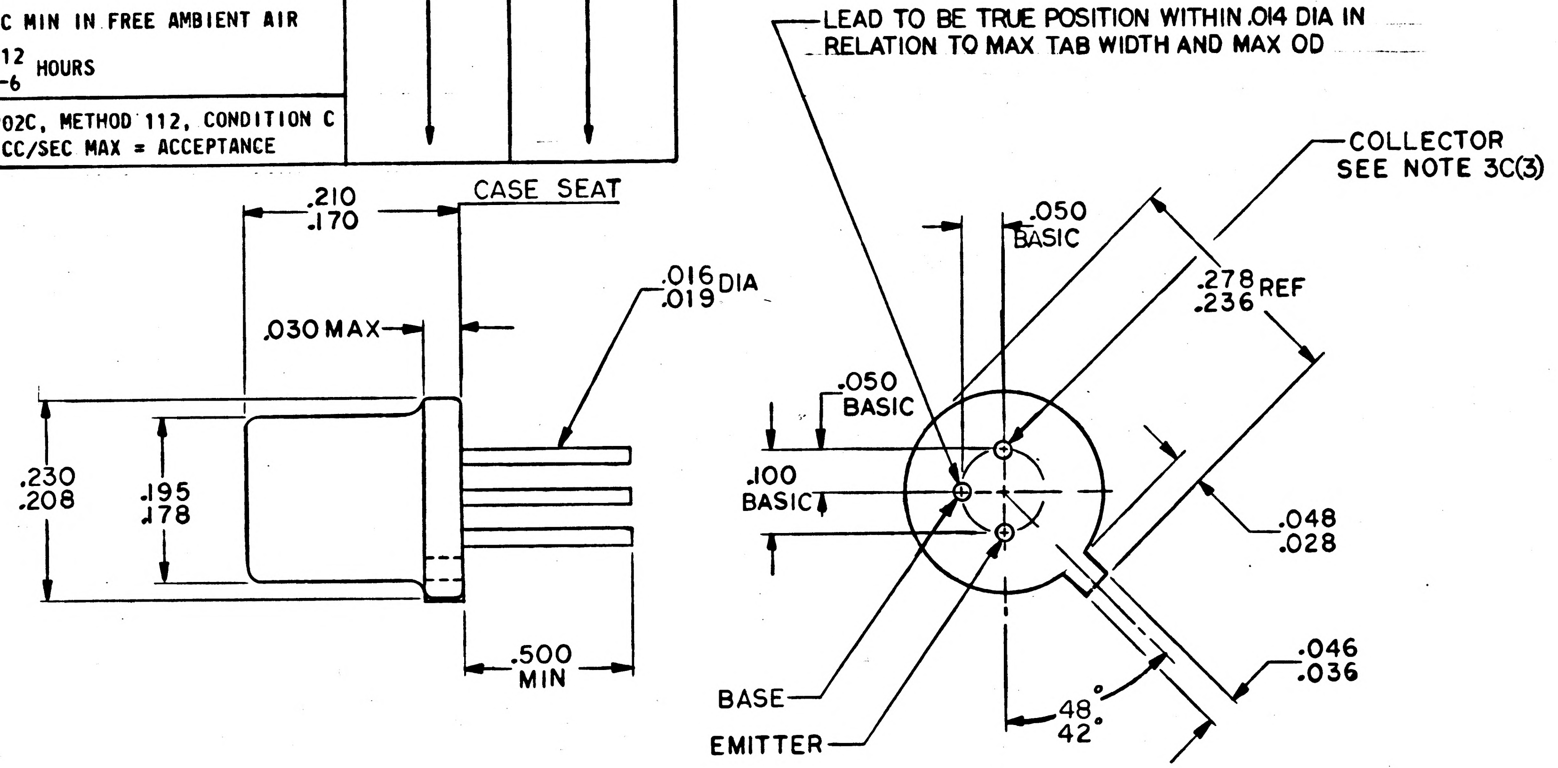
TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, T_{stg} = 300° ± 5°C, 72 $^{+8}_{-4}$ HOURS		
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)		
POWER, BURN-IN	METHOD 1026 P = 270 MILLIWATTS V_{CE} = -11.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS		
SEAL TEST	MIL-STD-202C, METHOD 112, CONDITION C 10^{-8} ATM CC/SEC MAX = ACCEPTANCE		



.210
.170
CASE SEAT
.030 MAX
.016
.019 DIA
.230
.208
.195
.178
.500 MIN
LEAD TO BE TRUE POSITION WITHIN .014 DIA IN RELATION TO MAX TAB WIDTH AND MAX OD
COLLECTOR SEE NOTE 3C(3)
.050 BASIC
.278
.236 REF
.050 BASIC
.100 BASIC
.048
.028
.046
.036
48°
42°
BASE
EMITTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

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CONTRACT
DRAWN D. Money DMS DATE 1DEC64
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APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL C.C. [illegible] 1/26/65
MIT APPROVAL
MIT APPROVAL W K[illegible] 26 Jan 65

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HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 2 OF 4

15737

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1006310 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B		
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	18 Mar 65	W.R.

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 2 A (3))				LTPD* = 10 MAX ACC NO.= 3	LTPD* = 10 MAX ACC NO.= 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	NA	100% ↓	LTPD* = 2 (COMBINED) MAX ACC NO.= 3 ↓
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = -10 uA; I_E = 0	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V; I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = -10 uA; I_C = 0	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	I_C = -10 mA PULSED I_B = 0	60				
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE} = -20 V; R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CES}	V_{BE} = -0; V_{CE} = -50 V		10	NA		
DC CURRENT GAIN	h_{FE}	I_C = -150 mA; V_{CE} = -10 V	100	300			
DC CURRENT GAIN	h_{FE}	I_C = -10 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN	h_{FE}	I_C = -1 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN	h_{FE}	I_C =-500 mA: V_{CE} = -10 V	30				
BASE-EMITTER SATURATION VOLTAGE	V_{BE}(sat)	I_C=-50 mA: I_B = -2.5 mA	0.7	-1.0	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE}(sat)	I_C = -50 mA; I_B = -2.5 mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE}(sat)	I_C = -150 mA; I_B = -15 mA		0.4	V		
COLLECTOR CAPACITANCE	C_{obo}	V_{CB} = -10 V; I_E = 0; F = 0.14 mc		8	PF		
TURN ON TIME	t_{on}	I_{B1} = I_{B2} = 30 mA; I_C = 300 mA t_w > 400 nsec 2% DUTY CYCLE		40	NSEC		
TURN OFF TIME	t_{off}	I_{B1} = I_{B2} = 30 mA; I_C = 300 mA t_w > 400 nsec 2% DUTY CYCLE		100	NSEC		

*LTPD PER MIL-S-19500D, TABLE CI OR II

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
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NASA APPROVAL G. C. [illegible] 1/26/65
MIT APPROVAL
MIT APPROVAL W. [illegible] 26 Jan 65

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HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 3 OF 4

15737

1006310 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	18Mar65	WR

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

TABLE III

QUALITY DEMONSTRATION TESTS

TEST	MIL-STD-750 TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2** THERMAL SHOCK SEAL TEST	METHOD 1056.I CONDITION B (+200°C TO -65°C, 5 CYCLES)		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031.I Tstg = 200° ± 5°C, 1000 HOURS METHOD 2016.I 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026.I P = 270 MILLIWATTS V_{CE} =-11 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		λ * = 10 MAX ACC NO.= 3
SUBGROUP 5** LEAD TENSION (COND A) LEAD FATIGUE (COND E)	METHOD 2036 4 POUND LOAD FOR 10 SECONDS 6 ARCS		LTPD = 20 (COMBINED) MAX ACC NO.= 3

* PER MIL-S-19500D TABLE CI OR II

** TESTS TO BE PERFORMED IN ORDER INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_C = 0	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±50% *
DC CURRENT GAIN	hFE	V_{CE} = -1 V, I_C = -10 mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = -1 V, I_C = -10 mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 NANOAMPERES MAY BE CONSIDERED TO BE 5 NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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DO NOT SCALE THIS DRAWING
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TYPE PNP SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 4 OF 4

MASTER

4 3 2 1 15737

1006310 B

SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	16 Feb 65	WK
B	REVISED PER TDRR 20618	27 Sep 65	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. MARKING:

(1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6310). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL. A LEAKAGE RATE OF 1 X 10^{-8} CC-ATM-SEC OR GREATER SHALL CONSTITUTE A FAILURE.

. ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

(1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

(2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

COLLECTOR CUTOFF CURRENT
COLLECTOR-BASE BREAKDOWN VOLTAGE
EMITTER-BASE BREAKDOWN VOLTAGE
EMITTER-BASE REVERSE CURRENT
COLLECTOR-EMITTER SUSTAINING VOLTAGE
COLLECTOR-EMITTER CURRENT
COLLECTOR-EMITTER THRESHOLD CURRENT
DIRECT CURRENT GAIN
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE
COLLECTOR CAPACITANCE
TURN-ON AND TURN-OFF TIME

(3) QUALITY DEMONSTRATION TESTING: PER TABLE III ON LOTS MORE THAN 500 UNITS USING ACCEPTABLE UNITS FROM SUBGROUP 2 OF TABLE II FOR SUBGROUP 2, 3, AND 4 OF TABLE III. SUBGROUPS 1 AND 5 MAY USE ELECTRICAL REJECTS FROM THE SAME LOT.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH PARA.2 .C(1) OR 2.C(3). UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED UNDER SEPARATE COVER WITH TEST DATA FOR EACH LOT SHIPMENT.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150°C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

(1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 40 VDC

(2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC

(3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC

(4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES

(5) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 50°C/WATT

(6) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 350°C/WATT

(7) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +150°C.

(8) TEMPERATURE RANGE, STORAGE: -65°C TO +150°C

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL PNP

(2) CASE: METAL CAN AND METAL HEADER HERMETICALLY SEALED (JEDEC TO-18)

(3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

(4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:

(1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

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TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 1 OF 4

4 3 2 1

15737

B | 1006310

SYM	REVISIONS DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	19 Mar 65	WK
B	REVISED PER TDRR 20618	7/27/65	WK

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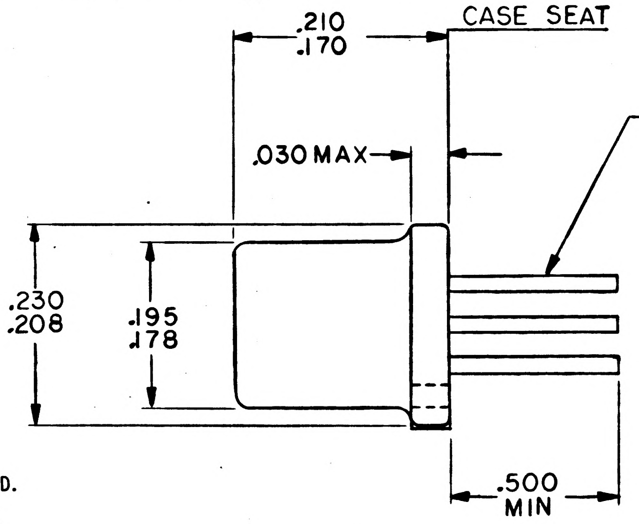
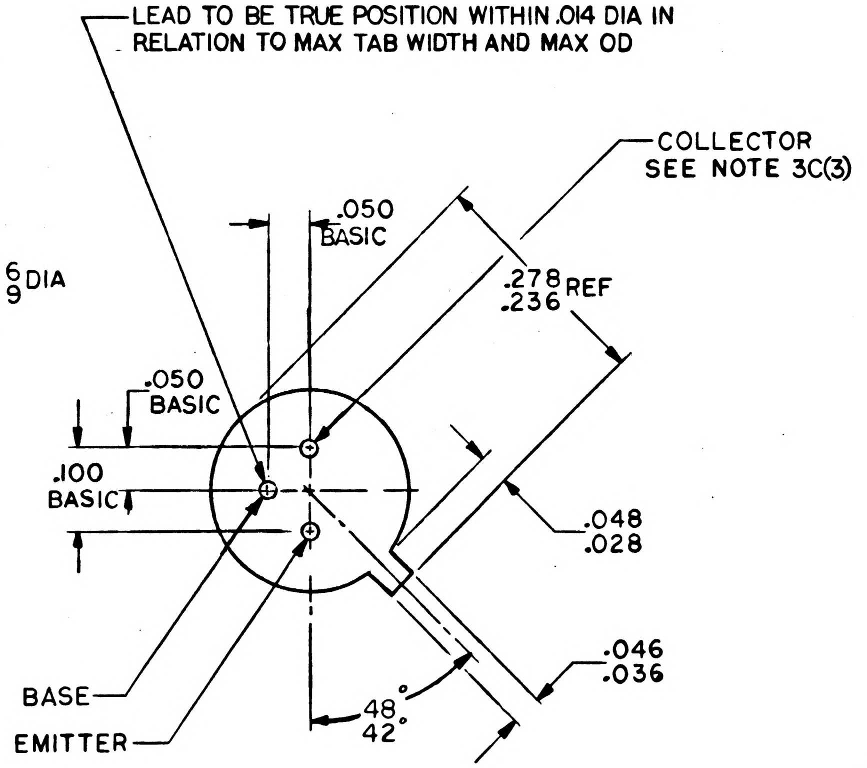
TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK*	METHOD 1056, CONDITION B (+150°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE* (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, Tstg = 150° ± 5°C, 72 $^{+8}_{-4}$ HOURS	↓	↓
CONSTANT ACCELERATION*	METHOD 2006 (20,000 G) Y_1 AXIS	↓	↓
POWER, BURN-IN*	METHOD 1026 P = 350 MILLIWATTS V_{CE} = -20.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST*	MIL-STD-202C, METHOD 112, CONDITION C 10^{-8} ATM CC/SEC MAX = ACCEPTANCE	↓	↓





* TESTS TO BE PERFORMED IN ORDER INDICATED.

** PULSE ≤ 300 U SECS AT ≤ 2% DUTY CYCLE.

*** LTPD OR PER MIL-S-19500D, TABLE CI OR CII

**** THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 10 NANOAMPERES MAY BE CONSIDERED TO BE 10 NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

⊕ CURRENTS TO WITHIN ± 10%.

MASTER

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MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
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TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
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CODE IDENT NO. 80230
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NASA DRAWING NO. 1006310
SCALE NONE
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SHEET 2 OF 4

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1006310 B

15737

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B		
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	18Mar65	WR.
B	REVISED PER TDRR 20618	7/27/65	WR

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1							
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 2 A (3))				LTPD*** = 10 MAX ACC NO.= 3	LTPD*** = 10 MAX ACC NO.= 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	NA	100%	LTPD*** = 2 (COMBINED) MAX ACC NO.= 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = -10 uA; I_E = 0	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V; I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = -10 uA; I_C = 0	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE**	V_{CEO} SUST	I_C = -10 mA PULSED I_B = 0	60				
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE} = -20 V; R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CES}	V_{BE} = -0; V_{CE} = -50 V		10	NA		
DC CURRENT GAIN**	h_{FE}	I_C = -150 mA; V_{CE} = -10 V	80	240			
DC CURRENT GAIN**	h_{FE}	I_C = -10 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN	h_{FE}	I_C = -1 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN **	h_{FE}	I_C =-500 mA: V_{CE} = -10 V	30				
BASE-EMITTER SATURATION VOLTAGE **	$V_{BE}(sat)$	I_C=-50 mA: I_B = -2.5 mA	0.7	-1.0	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE}(sat)$	I_C = -50 mA; I_B = -2.5 mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE}(sat)$	I_C = -150 mA; I_B = -15 mA		0.4	V		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = -10 V; I_E = 0; F = 0.14 mc		8	PF		
TURN ON TIME	t_{on}	I_{B1} ≈ 30⊕mA; I_C ≈ 300⊕mA t_w > 400 nsec 2% DUTY CYCLE		40	NSEC	LTPD*** = 5 MAX ACC = 0	LTPD*** = 5 MAX ACC = 0
TURN OFF TIME	t_{off}	I_{B1} = I_{B2} ≈ 30●mA; I_C ≈ 300●mA t_w > 400 nsec 2% DUTY CYCLE		100	NSEC		

MASTER

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MATERIAL: SEE NOTE
HEAT TREATMENT: NONE
FINAL FINISH: NONE

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SHEET 3 OF 4

4 3 2 1 15737

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1006310 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	18Mar65	WK
B	REVISED PER TDRR 20618	7/27/65	WK

TABLE III

QUALITY DEMONSTRATION TESTS

TEST	MIL-STD-750 TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	*** LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2* THERMAL SHOCK SEAL TEST	METHOD 1056.1 CONDITION B (+150°C TO -65°C, 5 CYCLES)		*** LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3* STORAGE LIFE	METHOD 1031.1 Tstg = 150° ± 5°C, 1000 HOURS		*** LTPD = 10 (COMBINED) MAX ACC NO.= 3
SHOCK	METHOD 2016.1 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL		
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM.		
CONSTANT ACCELERATION	METHOD 2006, 20,000 G Y_1 AXIS		
SUBGROUP 4 OPERATION LIFE	METHOD 1026.1 P = 350 MILLIWATTS V_{CE} = -20 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		λ^{***} = 10 MAX ACC NO.= 3
SUBGROUP 5* LEAD TENSION (COND A) LEAD FATIGUE (COND E)	METHOD 2036 4 POUND LOAD FOR 10 SECONDS 3 ARCS		*** LTPD = 20 (COMBINED) MAX ACC NO.= 3

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_C = 0	±50% ****
EMITTER - BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±50% ****
DC CURRENT GAIN	hFE	V_{CE} = -10V, I_C = -10 mA	±10% ****
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_E = 0	±100% ****
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±100% ****
DC CURRENT GAIN	hFE	V_{CE} = -10V, I_C = -10 mA	±20% ****

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

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DWG. NO. CONTRACT
DRAWN DMS DATE 2DEC64
CHECKED R.T. [illegible] WSM 9DEC64
APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL [illegible]
MIT APPROVAL
MIT APPROVAL [illegible] 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE PNP, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 4 OF 4

MASTER

4 3 2 1

15737

1006310 | C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	[illegible] 65	WK
B	REVISED PER TDRR 20618	27 [illegible] 65	WK
C	REVISED PER TDRR 24264	11/30/65	WK

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. MARKING:

(1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6310). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL.

. ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

(1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

(2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

COLLECTOR CUTOFF CURRENT
COLLECTOR-BASE BREAKDOWN VOLTAGE
EMITTER-BASE BREAKDOWN VOLTAGE
EMITTER-BASE REVERSE CURRENT
COLLECTOR-EMITTER SUSTAINING VOLTAGE
COLLECTOR-EMITTER CURRENT
COLLECTOR-EMITTER THRESHOLD CURRENT
DIRECT CURRENT GAIN
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE
COLLECTOR CAPACITANCE
TURN-ON AND TURN-OFF TIME

(3) QUALITY DEMONSTRATION TESTING: PER TABLE III ON LOTS MORE THAN 500 UNITS USING ACCEPTABLE UNITS FROM SUBGROUP 2 OF TABLE II FOR SUBGROUP 2, 3, AND 4 OF TABLE III. SUBGROUPS 1 AND 5 MAY USE ELECTRICAL REJECTS FROM THE SAME LOT.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH PARA.2 .C(1) OR 2.C(3). UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED UNDER SEPARATE COVER WITH TEST DATA FOR EACH LOT SHIPMENT.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150°C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

(1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 40 VDC

(2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC

(3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC

(4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES

(5) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 50°C/WATT

(6) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 350°C/WATT

(7) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +150°C.

(8) TEMPERATURE RANGE, STORAGE: -65°C TO +150°C

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL PNP

(2) CASE: METAL CAN AND METAL HEADER, HERMETICALLY SEALED (JEDEC TO-18)

(3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

(4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:

(1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT: NONE
FINAL FINISH: NONE

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DRAWN D. Maney DMS DATE 30 Nov 64
CHECKED R.T. Dromander 9 Dec 64 WBM
APPROVAL
APPROVAL Ella C. Hall 22 Jan 65
NASA APPROVAL G.C. White Jan 1 26/65
MIT APPROVAL
MIT APPROVAL W. [illegible] 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006310
SCALE NONE	WT	SHEET 1 OF 4

15737

1006310 C

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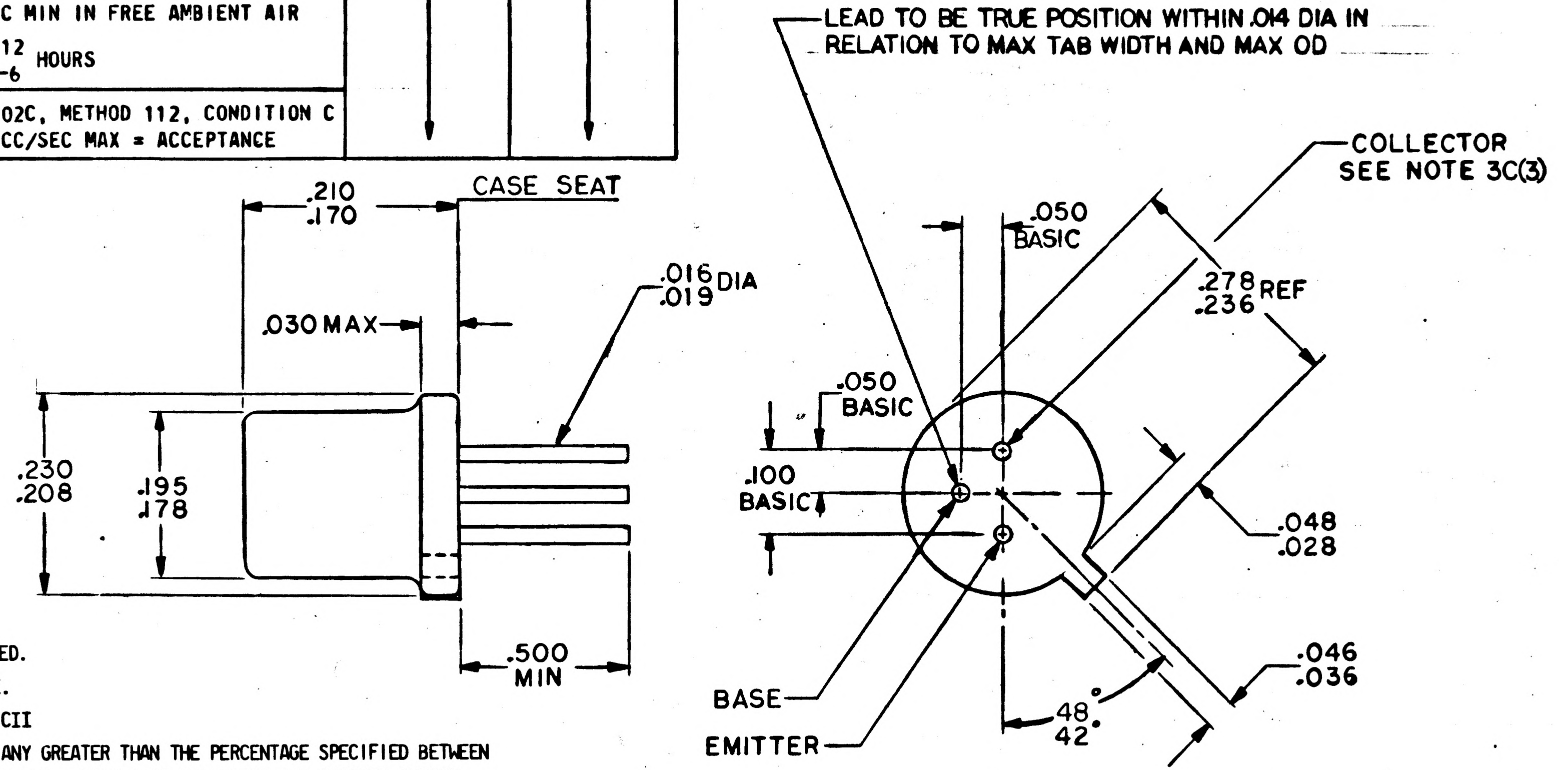
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	19 May 65	WK
B	REVISED PER TDRR 20618	7/27/65	WK
C	REVISED PER TDRR 24264	11/30/65	WK

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK*	METHOD 1056, CONDITION B (+150°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE* (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, Tstg = 150° ± 5°C, 72 $^{+8}_{-4}$ HOURS	↓	↓
CONSTANT ACCELERATION*	METHOD 2006 (20,000 G) Y_1 AXIS	↓	↓
POWER, BURN-IN*	METHOD 1026 P = 350 MILLIWATTS V_{CE} = -20.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST*	MIL-STD-202C, METHOD 112, CONDITION C 10^{-8} ATM CC/SEC MAX = ACCEPTANCE	↓	↓



* TESTS TO BE PERFORMED IN ORDER INDICATED.

** PULSE ≤ 300 U SECS AT ≤ 2% DUTY CYCLE.

*** LTPD OR PER MIL-S-19500D, TABLE CI OR CII

**** THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 10 NANOAMPERES MAY BE CONSIDERED TO BE 10 NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

⊕ CURRENTS TO WITHIN ± 10%.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT: NONE
FINAL FINISH: NONE

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DRAWN D. Money DMS DATE 1DEC64
CHECKED R.T. Desmarais WSM 10DEC64
APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL G.C. Mosley 1/26/65
MIT APPROVAL
MIT APPROVAL W Kupfer 26 Jan 65

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TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 2 OF 4

15737

1006310 C

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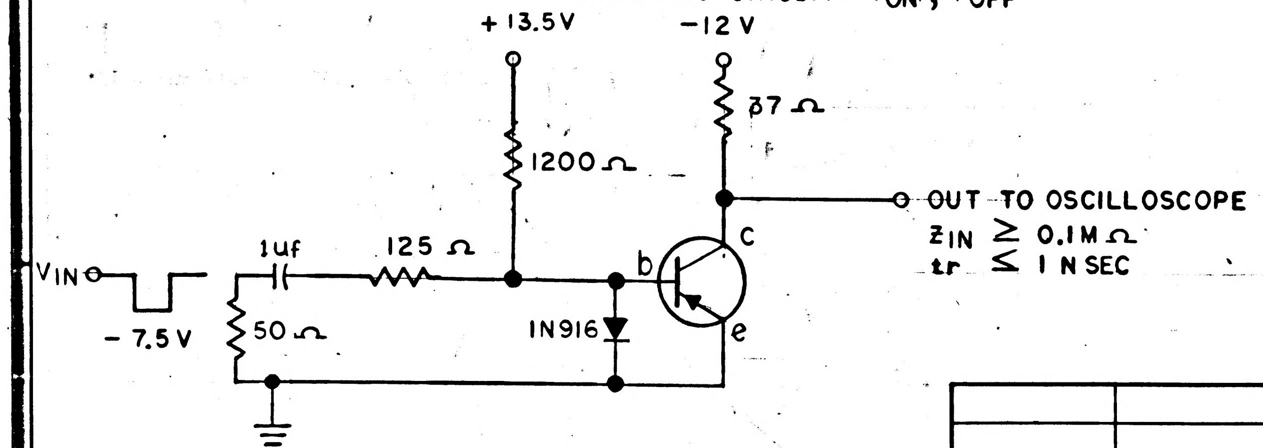
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B		
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	18 Mar 65	WR
B	REVISED PER TDRR 20618	7/27/65	WR
C	REVISED PER TDRR 24264	11/30/65	WR

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS	LIMIT MIN	LIMIT MAX	UNITS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 2 A (3))				LTPD*** = 10 MAX ACC NO.= 3	LTPD*** = 10 MAX ACC NO.= 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	NA	100%	LTPD*** = 2 (COMBINED) MAX ACC NO.= 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = -10 uA; I_E = 0	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V; I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = -10 uA; I_C = 0	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE**	V_{CEO} SUST	I_C = -10 mA PULSED I_B = 0	60				
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE} = -20 V; R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CES}	V_{BE} = -0; V_{CE} = -50 V		10	NA		
DC CURRENT GAIN**	h_{FE}	I_C = -150 mA; V_{CE} = -10 V	80	240			
DC CURRENT GAIN**	h_{FE}	I_C = -10 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN	h_{FE}	I_C = -1 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN **	h_{FE}	I_C =-500 mA: V_{CE} =-10 V	30				
BASE-EMITTER SATURATION VOLTAGE **	V_{BE}(sat)	I_C=-50 mA: I_B = -2.5 mA	0.7	-1.0	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	V_{CE}(sat)	I_C = -50 mA; I_B = -2.5 mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	V_{CE}(sat)	I_C = -150 mA; I_B = -15 mA		0.4	V		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = -10 V; I_E = 0; F = 0.14 mc		8	PF	LTPD*** = 5 MAX ACC = 0	LTPD*** = 5 MAX ACC = 0
TURN ON TIME TEST IN CIRCUIT OF FIG. I	t_{on}	I_{B1} ≈ 30 mA; I_C ≈ 300 mA t_w > 400 nsec 2% DUTY CYCLE		40	NSEC		
TURN OFF TIME	t_{off}	I_{B1} = I_{B2} ≈ 30 mA; I_C ≈ 300 mA t_w > 400 nsec 2% DUTY CYCLE		120	NSEC		

SWITCHING CIRCUIT: T_{ON}; T_{OFF}



VOLTAGE IN: V_{IN} = 7 5V

PULSE WIDTH: P_W = 0.5 μSEC

TOTAL RISE, FALL: $t_r + t_f \leq 6$ N SEC

IMPEDANCE IN: $Z_{IN} = 50\ \Omega$

MASTER

FIGURE I

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT NONE

FINAL FINISH NONE

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DRAWN DMS DATE
CHECKED R. T. WSM
APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 3 OF 4

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1006310 C

15737

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	1 Mar 65	WK
B	REVISED PER TDRR 20618	7/27/65	WK
C	REVISED/PER TDRR 24264	11/30/65	WK

TABLE III

QUALITY DEMONSTRATION TESTS			
TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	*** LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2* THERMAL SHOCK SEAL TEST	METHOD 1056.1 CONDITION B (+150°C TO -65°C, 5 CYCLES)		*** LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3* STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031.1 Tstg = 150° ± 5°C, 1000 HOURS METHOD 2016.1 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G Y_1 AXIS		*** LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026.1 P = 350 MILLIWATTS V_{CE} = -20 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		λ^{***} = 10 MAX ACC NO.= 3
SUBGROUP 5* LEAD TENSION (COND A) LEAD FATIGUE (COND E)	METHOD 2036 4 POUND LOAD FOR 10 SECONDS 3 ARCS		*** LTPD = 20 (COMBINED) MAX ACC NO.= 3

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_C = 0	±50% ****
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±50% ****
DC CURRENT GAIN	hFE	V_{CE} = -10V, I_C = -10 mA	±10% ****
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_E = 0	±100% ****
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±100% ****
DC CURRENT GAIN	hFE	V_{CE} = -10V, I_C = -10 mA	±20% ****

**** [illegible] MAY NOT CHANGE [illegible] THAN THE PERCENT OF
[illegible] THE INITIAL [illegible]
[illegible] EMITTER [illegible] CURRENTS LESS THAN [illegible]
[illegible]

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT NONE

FINAL FINISH NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

M I T
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DRAWN D. [illegible] DMS DATE 2 DEC 64
CHECKED R.T. [illegible] WSM 9 DEC 64
APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL G. C. Mt [illegible]
MIT APPROVAL
MIT APPROVAL W [illegible] 26 Jan 65

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TRANSISTOR, SILICON, TYPE PNP, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 4 OF 4

15737

D 1006310

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	JPGRADED TO CLASS A WITH CHANCE PER TDRR 17369		WK
B	REVISED PER TDRR 20618	27	WK
Ⓝ C	REVISED PER TDRR 24264	11/30/65	WK
D	REVISED PER TDRR 28254	5/-/66	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. SHIPMENT LOTS MUST MEET THE ACCEPTANCE REQUIREMENTS OF ND 1002266. PROCESSING IN ACCORDANCE WITH ND 1002266 SHALL BE PERFORMED AT THE BUYER'S PLANT. LOTS NOT MEETING THE ACCEPTANCE CRITERIA OF ND 1002266 SHALL BE REJECTED TO THE VENDOR.

F. MARKING:

(1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6310). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

G. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL.

C. ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

(1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

(2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

COLLECTOR CUTOFF CURRENT
COLLECTOR-BASE BREAKDOWN VOLTAGE
EMITTER-BASE BREAKDOWN VOLTAGE
EMITTER-BASE REVERSE CURRENT
COLLECTOR-EMITTER SUSTAINING VOLTAGE
COLLECTOR-EMITTER CURRENT
COLLECTOR-EMITTER THRESHOLD CURRENT
DIRECT CURRENT GAIN
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE
COLLECTOR CAPACITANCE
TURN-ON AND TURN-OFF TIME

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH PARA.2.C(1)

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150°C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

(1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 40 VDC

(2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC

(3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC

(4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES

(5) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 50°C/WATT

(6) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 350°C/WATT

(7) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +150°C.

(8) TEMPERATURE RANGE, STORAGE: -65°C TO +150°C

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL PNP

(2) CASE: METAL CAN AND METAL ~~HEADER~~, HERMETICALLY SEALED (JEDEC TO-18)

(3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

(4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:

(1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DMS DATE 30NOV64
CHECKED R.T. WBM 9DEC64
APPROVAL
APPROVAL Elden C Hall 22Jan65
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 1 OF 3

1006310 D

15737

1006310 D

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

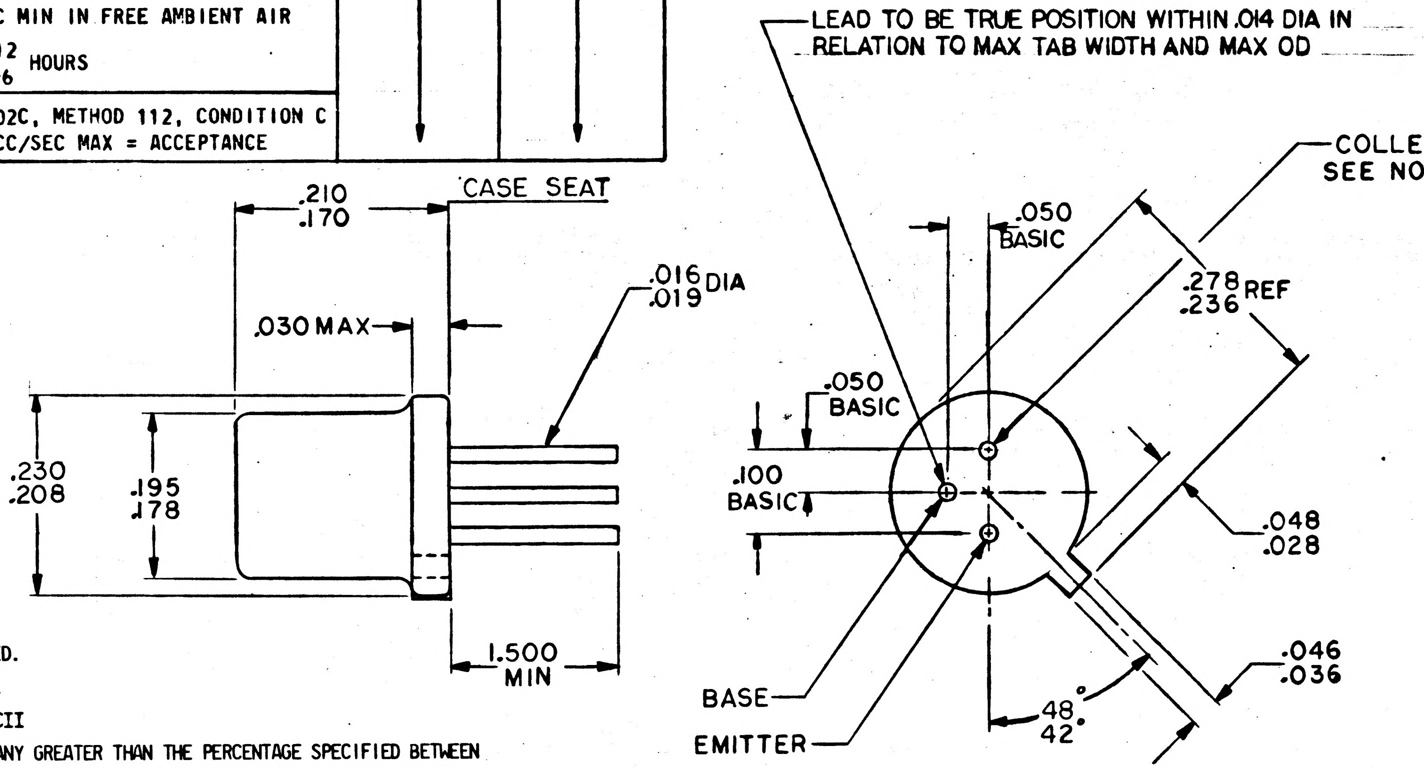
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	[illegible]	WK
B	REVISED PER TDRR 20618	7/27/65	WK
C	REVISED PER TDRR 24264	11/30/65	WK
D	REVISED PER TDRR 28254	5-16-66	[illegible]

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	MIL-STD-750 TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK*	METHOD 1056, CONDITION B (+150°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE* (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, Tstg = 150° ± 5°C, 72 $^{+8}_{-4}$ HOURS		
CONSTANT ACCELERATION*	METHOD 2006 (20,000 G) Y_1 AXIS		
POWER, BURN-IN*	METHOD 1026 P = 350 MILLIWATTS V_{CE} = -20.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS		
SEAL TEST*	MIL-STD-202C, METHOD 112, CONDITION C 10^{-8} ATM CC/SEC MAX = ACCEPTANCE		



* TESTS TO BE PERFORMED IN ORDER INDICATED.

** PULSE ≤ 300 U SECS AT ≤ 2% DUTY CYCLE.

*** LTPD OR PER MIL-S-19500D, TABLE CI OR CII

**** THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 10 NANOAMPERES MAY BE CONSIDERED TO BE 10 NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

● CURRENTS TO WITHIN ± 10%.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

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APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL C.C. McKyer 1/26/65
MIT APPROVAL
MIT APPROVAL W Kupfer 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 2 OF 3

1006310

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1006310 D

15737

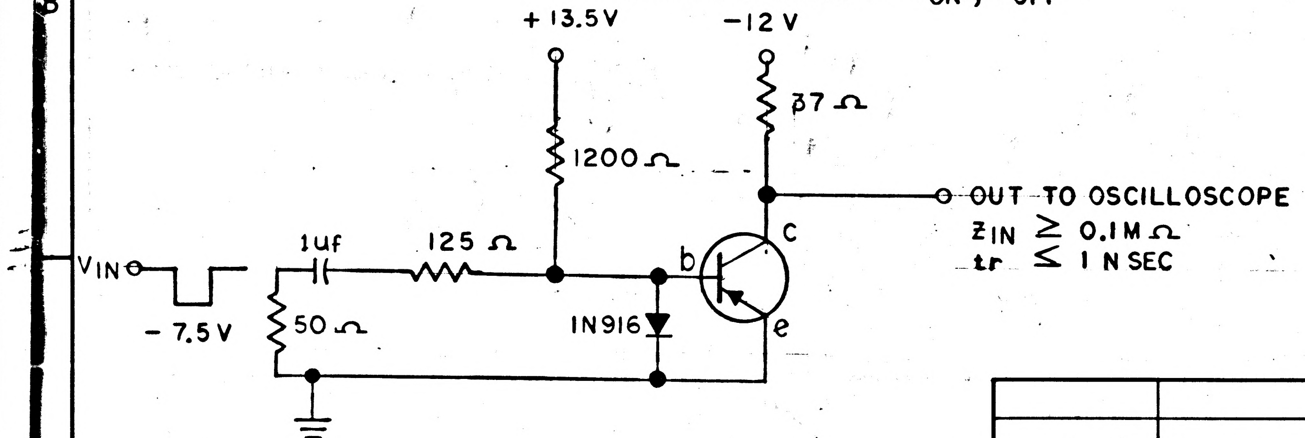
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B		
A	UPGRADED TO CLASS A WITH CHANGE PER TDRR 17369	18 Mar 65	WR
B	REVISED PER TDRR 20618	7/27/65	WR
C	REVISED PER TDRR 24264	11/30/65	WR
D	REVISED PER TDRR 28254	5-6-66	

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1							
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 2 A (3))				LTPD*** = 10 MAX ACC NO. = 3	LTPD*** = 10 MAX ACC NO. = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	NA	100%	LTPD*** = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} = -50 V; I_E = 0		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = -10 uA; I_E = 0	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = -3 V; I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = -10 uA; I_C = 0	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE**	V_{CEO} SUST	I_C = -10 mA PULSED I_B = 0	60				
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE} = -20 V; R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD. CURRENT	I_{CES}	V_{BE} = -0; V_{CE} = -50 V		10	NA		
DC CURRENT GAIN**	h_{FE}	I_C = -150 mA; V_{CE} = -10 V	80	240			
DC CURRENT GAIN**	h_{FE}	I_C = -10 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN	h_{FE}	I_C = -1 mA; V_{CE} = -10 V	100				
DC CURRENT GAIN **	h_{FE}	I_C =-500 mA: V_{CE} = -10 V	30				
BASE-EMITTER SATURATION VOLTAGE **	V_{BE}(sat)	I_C=-50 mA: I_B = -2.5 mA	0.7	-1.0	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	V_{CE}(sat)	I_C = -50 mA; I_B = -2.5 mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	V_{CE}(sat)	I_C = -150 mA; I_B = -15 mA		0.4	V		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = -10 V; I_E = 0; F = 0.14 mc		8	PF		
TURN ON TIME } TEST IN CIRCUIT OF FIG. I	t_{on}	I_{B1} ≈ 30● mA; I_C ≈ 300● mA t_w > 400 nsec 2% DUTY CYCLE		40	NSEC	LTPD*** = 5 MAX ACC = 0	LTPD*** = 5 MAX ACC = 0
TURN OFF TIME } TEST IN CIRCUIT OF FIG. I	t_{off}	I_{B1} = I_{B2} ≈ 30● mA; I_C ≈ 300● mA t_w > 400 nsec 2% DUTY CYCLE		120	NSEC		

SWITCHING CIRCUIT: T_{ON}; T_{OFF}



VOLTAGE IN: V_{IN} = 7.5V
PULSE WIDTH: P_W = 0.5 μSEC
TOTAL RISE, FALL: $t_r + t_f \leq 6$ N SEC
IMPEDANCE IN: Z_{IN} = 50 Ω

MASTER

FIGURE I

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Murray DMS DATE 1 DEC 64
CHECKED R.T. Dionne WSM 9 Dec 64
APPROVAL
APPROVAL Eldon C. Hall 22 Jan 65
NASA APPROVAL G. C. ... 1/26/65
MIT APPROVAL
MIT APPROVAL ... 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 3 OF 3

15737

—	1006310

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500/290 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. MARKING:

(1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6310). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

(1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

(2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

COLLECTOR CUTOFF CURRENT
COLLECTOR-BASE BREAKDOWN VOLTAGE
EMITTER-BASE BREAKDOWN VOLTAGE
EMITTER-BASE REVERSE CURRENT
COLLECTOR-EMITTER SUSTAINING VOLTAGE
COLLECTOR-EMITTER CURRENT
COLLECTOR-EMITTER THRESHOLD CURRENT
DIRECT CURRENT GAIN
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE
COLLECTOR CAPACITANCE
TURN-ON AND TURN-OFF TIME

(3) QUALITY DEMONSTRATION TESTING: PER TABLE III USING ACCEPTABLE UNITS FROM SUBGROUP 2 OF TABLE II FOR SUBGROUP 2, 3, AND 4 OF TABLE III. SUBGROUPS 1 AND 5 MAY USE ELECTRICAL REJECTS FROM THE SAME LOT.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +200°C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

(1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 40 VDC
(2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC
(3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC
(4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES
(5) POWER DISSIPATION (P_T): 0.4 WATTS
1.8 WATTS AT 25°C CASE TEMPERATURE
(6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT
(7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 435°C/WATT
(8) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
(9) TEMPERATURE RANGE, STORAGE: -65°C TO +300°C

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL PNP
(2) CASE: METAL CASE HERMETICALLY SEALED (JEDEC TO-18)
(3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
(4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:

(1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

CLASS B RELEASE PER TDRR 15737 . DATE 1/26/65

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Maney DATE 30NOV64
CHECKED R.T. Dronsuk 9DEC64
APPROVAL
APPROVAL Eldon C Hall 22Jan65
NASA APPROVAL G.C. 1/26/65
MIT APPROVAL
MIT APPROVAL 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 1 OF 4

MASTER

1006310

15737

—	1006310

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

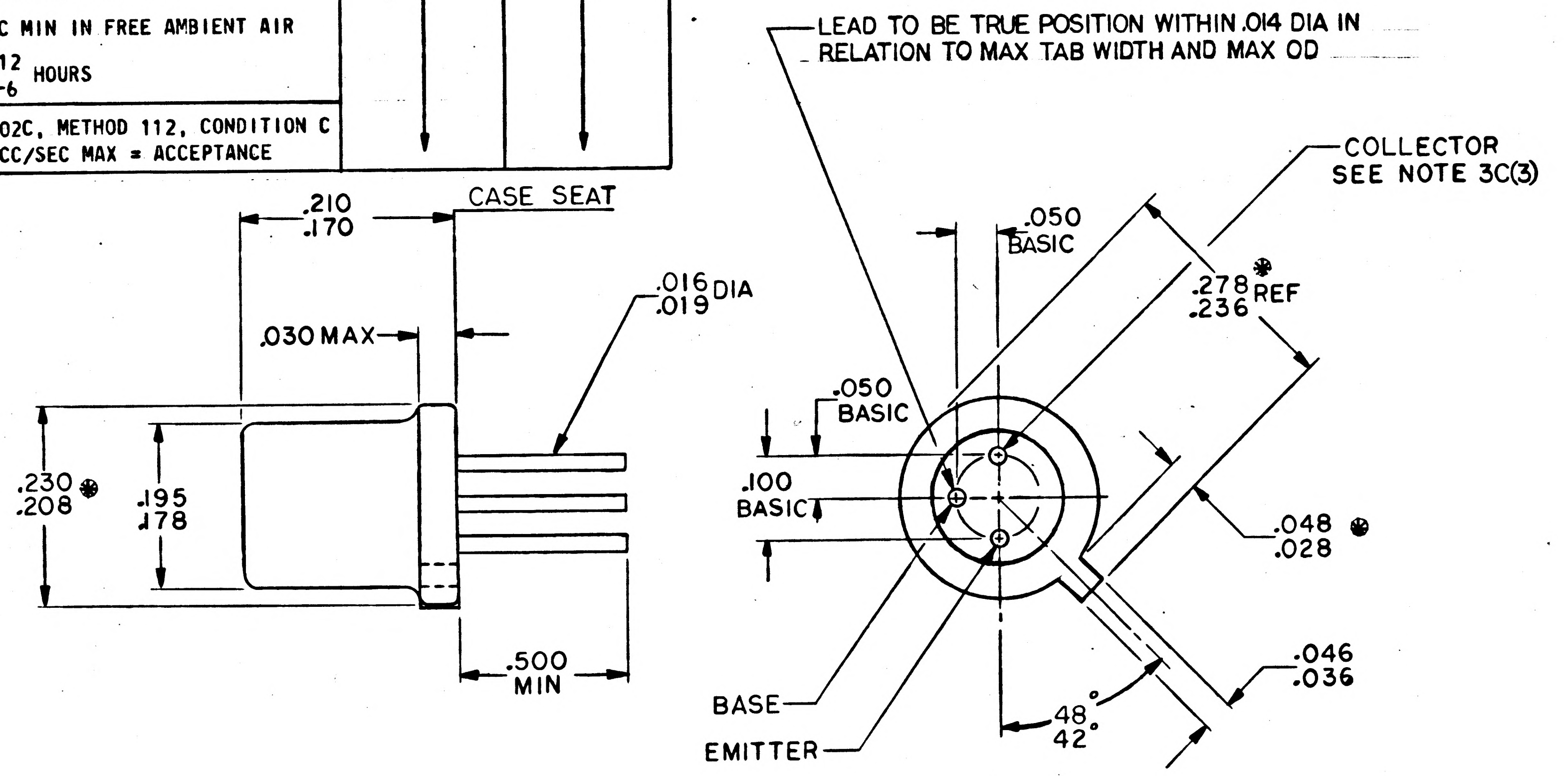
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, Tstg = 300° ± 5°C, $72 ^{+8}_{-4}$ HOURS	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 270 MILLIWATTS V_{CE} = -11.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168 ^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST	MIL-STD-202C, METHOD 112, CONDITION C 10^{-8} ATM CC/SEC MAX = ACCEPTANCE	↓	↓

CLASS B RELEASE PER TDRR 15737 DATE 1/26/65



.210
.170
CASE SEAT
.030 MAX
.016
.019 DIA
.230
.208 ✱
.195
.178
.500
MIN
LEAD TO BE TRUE POSITION WITHIN .014 DIA IN RELATION TO MAX TAB WIDTH AND MAX OD
COLLECTOR
SEE NOTE 3C(3)
.050
BASIC
.278 ✱
.236 REF
.050
BASIC
.100
BASIC
.048
.028 ✱
.046
.036
48°
42°
BASE
EMITTER

✱ TAB LENGTH IS DETERMINED BY DIFFERENCE OF (DIM. OVER TAB - OD)

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Money DMS DATE 10DEC64
CHECKED R.T. Demsuke W.S.M. 10DEC64
APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL C.C. Metzger 1/26/65
MIT APPROVAL
MIT APPROVAL W Kupfer 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006310
SCALE NONE | WT | SHEET 2 OF 4

MASTER

1006310

4 3 2 1 15737

—	1006310

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	INITIAL RELEASE CLASS B		

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TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 2 A (3))				LTPD* = 10 MAX ACC NO.= 3	LTPD* = 10 MAX ACC NO.= 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = -50$ V; $I_E = 0$		10	muA	100%	LTPD* = 2 (COMBINED) MAX ACC NO.= 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	$V_{CB} = -50$ V; $I_E = 0$		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C = -10$ uA; $I_E = 0$	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	$V_{EB} = -3$ V; $I_C = 0$		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E = -10$ uA; $I_C = 0$	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	$I_C = -10$ mA PULSED $I_B = 0$	60				
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	$V_{CE} = -20$ V; $R_{BE} = 100$ K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CES}	$V_{BE} = -0$; $V_{CE} = -50$ V		10	muA		
DC CURRENT GAIN	h_{FE}	$I_C = -150$ mA; $V_{CE} = -10$ V	100	300			
DC CURRENT GAIN	h_{FE}	$I_C = -10$ mA; $V_{CE} = -10$ V	140				
DC CURRENT GAIN	h_{FE}	$I_C = -1$ mA; $V_{CE} = -10$ V	135				
DC CURRENT GAIN	h_{FE}	$I_C = -500$ mA: $V_{CE} = -10$ V	50				
BASE-EMITTER SATURATION VOLTAGE	$V_{BE}(sat)$	$I_C = -50$ mA: $I_B = -2.5$ mA	0.7	-1.0	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE}(sat)$	$I_C = -50$ mA; $I_B = -2.5$ mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE}(sat)$	$I_C = -150$ mA; $I_B = -15$ mA		0.4	V		
COLLECTOR CAPACITANCE	C_{obo}	$V_{CB} = -10$ V; $I_E = 0$; F = 0.14 mc		10	PF		
TURN ON TIME	t_{on}	$I_{B1} = I_{B2} = 30$ mA; $I_C = 300$ mA $t_w > 400$ nsec 2% DUTY CYCLE		40	NSEC		
TURN OFF TIME	t_{off}	$I_{B1} = I_{B2} = 30$ mA; $I_C = 300$ mA $t_w > 400$ nsec 2% DUTY CYCLE		100	NSEC		

*LTPD PER MIL-S-19500D, TABLE CI OR II

CLASS B RELEASE PER TDRR 15737 DATE 1/26/65

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Money DMS DATE 1DEC64
CHECKED R.T. Dionne WSM 9 Dec 64
APPROVAL
APPROVAL Eldon C. Hall 22 Jan 65
NASA APPROVAL G.C. 1/26/65
MIT APPROVAL
MIT APPROVAL 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006310
SCALE NONE WT SHEET 3 OF 4

4 3 2 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

TABLE III

QUALITY DEMONSTRATION TESTS

TEST	MIL-STD-750 TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2** THERMAL SHOCK SEAL TEST	METHOD 1056, CONDITION B (+200°C TO -65°C, 5 CYCLES)		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3** STORAGE LIFE	METHOD 1031 Tstg = 200° ± 5°C, 1000 HOURS		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SHOCK	METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL		
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM.		
CONSTANT ACCELERATION	METHOD 2006, 20,000 G		
SUBGROUP 4 OPERATION LIFE	METHOD 1026 P = 270 MILLIWATTS V_{CE} =-11 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		λ * = 10 MAX ACC NO.= 3
SUBGROUP 5** LEAD TENSION LEAD FATIGUE	METHOD 2036 4 POUND LOAD FOR 10 SECONDS 4 POUND LOAD FOR 6 ARCS		LTPD = 20 (COMBINED) MAX ACC NO.= 3

* PER MIL-S-19500D TABLE CI OR II

** TESTS TO BE PERFORMED IN ORDER INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_C = 0	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±50% *
DC CURRENT GAIN	hFE	V_{CE} = -1 V, I_C = -10 mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = -50V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = -3 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = -1 V, I_C = -10 mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 MILLIMICROAMPERES MAY BE CONSIDERED TO BE 5 MILLIMICROAMPERES FOR CALCULATING PERCENTAGE CHANGE.

CLASS B RELEASE PER TDRR 15737 DATE 1/26/65

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Money DMS DATE 2 DEC 64
CHECKED R.T. Dromsuleer WSM 9 DEC 64
APPROVAL
APPROVAL Eldon C Hall 22 Jan 65
NASA APPROVAL G. C. Mat 27 Jan 1965
MIT APPROVAL
MIT APPROVAL W Kupfer 26 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE PNP, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006310
SCALE NONE
WT
SHEET 4 OF 4

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056 INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.

D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). NO MARKING SHALL APPEAR ON THE 32/ SURFACE.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSION: SHALL BE AS SHOWN.

(2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.

(3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.

(4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT INTENSITY: 15 FOOT-LAMBERTS MINIMUM INITIALLY WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.

(2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).

(3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1):15.0 MA MAX.

(4) CASE GND-TO-GND RESISTANCE: NLT 10.0 MEGOHMS.

3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.

B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.

E. MATERIAL: ALUMINUM ALLOY.

F. RATINGS:

(1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).

(2) PEAK CONTINUOUS VOLTAGE: 420V MAX.

(3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.

G. FINISH:

(1) CHROMATE TREAT PER MIL-C-5541 (AL CASE)

(2) PAINT SURFACES MARKED "A" BLACK EPOXY ENAMEL MIL-P-27316.

(3) METAL AREAS ON SURFACE "B" TO BE PAINTED MED GRAY PER ND1002279 USING PAINT 1008809-1

H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.

I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.

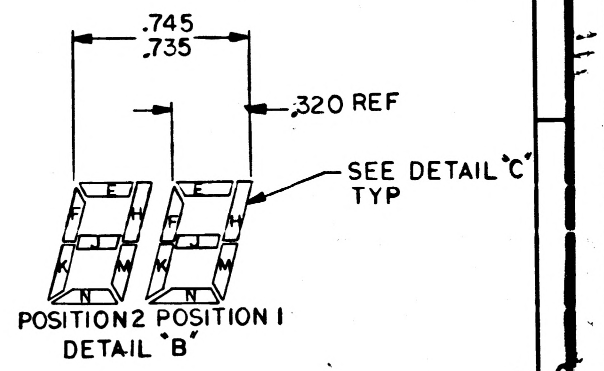
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND1002034 FOR THIS DRAWING.

SEGMENT TO CONNECTOR PIN CHART

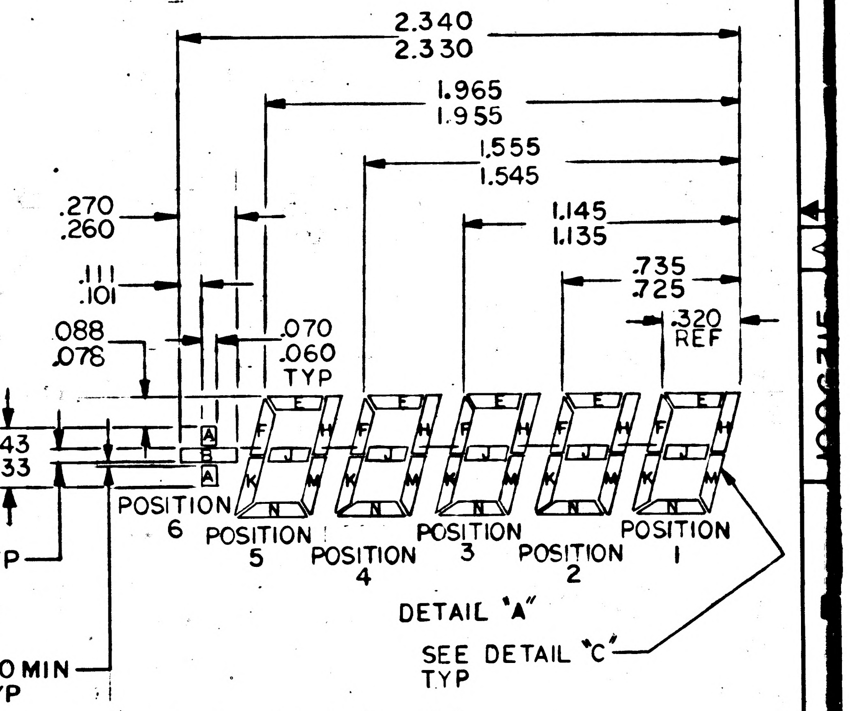
EXAMPLE: 3 2 J — REF DESIG (3), POSITION (2), SEGMENT (J)

SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
31N	4	21N	41	11N	78	41N	115
31J	5	21J	42	11J	79	41J	116
31K	6	21K	43	11K	80	41K	117
31F	7	21F	44	11F	81	41F	118
32E	8	22E	45	12E	82	42E	119
32H	9	22H	46	12H	83	42H	120
32M	10	22M	47	12M	84	42M	121
32N	11	22N	48	12N	85	42N	122
32J	12	22J	49	12J	86	42J	123
32K	13	22K	50	12K	87	42K	124
32F	14	22F	51	12F	88	42F	125
33E	15	23E	52	13E	89	51E	126
33H	16	23H	53	13H	90	51H	127
33M	17	23M	54	13M	91	51M	128
33N	18	23N	55	13N	92	51N	129
33J	19	23J	56	13J	93	51J	130
33K	20	23K	57	13K	94	51K	131
33F	21	23F	58	13F	95	51F	132
34E	22	24E	59	14E	96	52E	133
34H	23	24H	60	14H	97	52H	134
34M	24	24M	61	14M	98	52M	135
34N	25	24N	62	14N	99	52N	136
34J	26	24J	63	14J	100	52J	137
34K	27	24K	64	14K	101	52K	138
34F	28	24F	65	14F	102	52F	139
35E	29	25E	66	15E	103	71E	140
35H	30	25H	67	15H	104	71H	141
35M	31	25M	68	15M	105	71M	142
35N	32	25N	69	15N	106	71N	143
35J	33	25J	70	15J	107	71J	144
35K	34	25K	71	15K	108	71K	145
35F	35	25F	72	15F	109	71F	146
36A	36	26A	73	16A	110	72E	147
36B	37	26B	74	16B	111	72H	148
61A	154	250V 800~	157	72K	152	72M	149
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

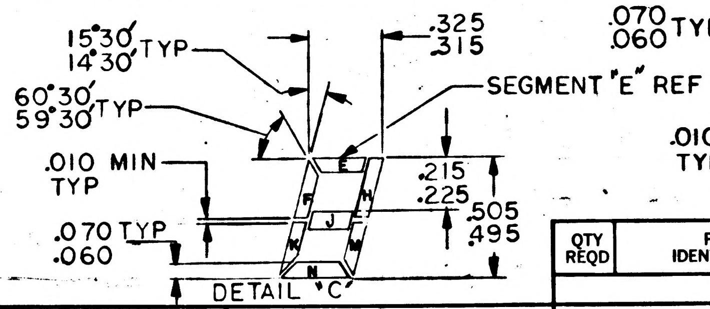
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793	EK		11/28/65	WK



DETAIL "B"



DETAIL "A"



DETAIL "C"

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	D. Money	29 MAR 65
CHECKED	J. Wolkowitz	31 MAR 65
APPROVED		
APPROVED	Eldon C Hall	27 May 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC	T Michael	6/2/65
		DATE

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HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006315
SCALE NONE
SHEET 1 OF 2

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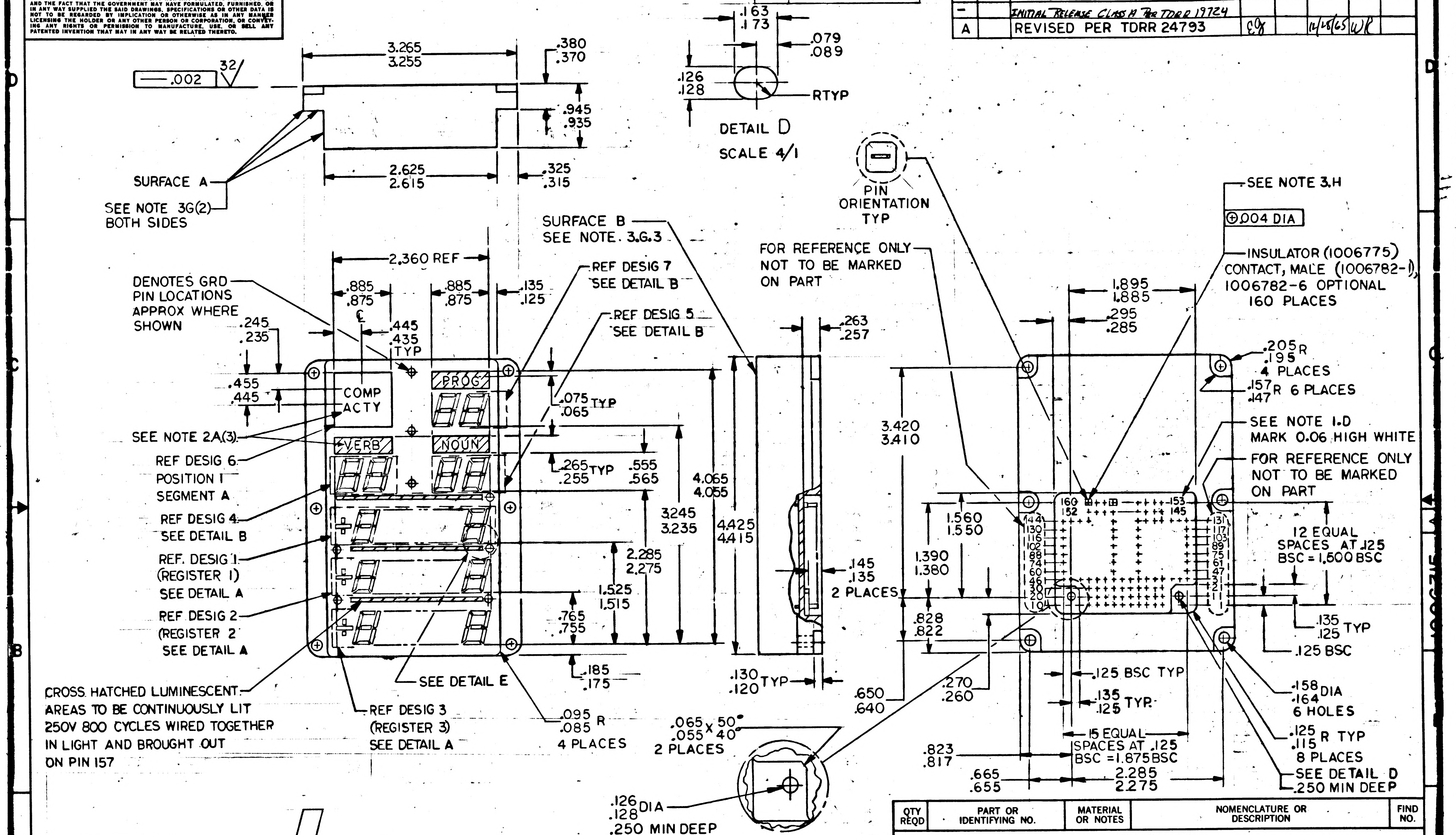
1006315 A

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793	E.G.		11/15/65	W.K.



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SURFACE A
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2.615
.325
.315
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BOTH SIDES
PIN
ORIENTATION
TYP
SURFACE B
SEE NOTE. 3.G.3
FOR REFERENCE ONLY
NOT TO BE MARKED
ON PART
SEE NOTE 3.H
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INSULATOR (1006775)
CONTACT, MALE (1006782-1),
1006782-6 OPTIONAL
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.885
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REF DESIG 7
SEE DETAIL B
REF DESIG 5
SEE DETAIL B
DENOTES GRD
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ACTY
PROG
VERB
NOUN
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.065
TYP
SEE NOTE 2A(3)
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POSITION 1
SEGMENT A
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.255
TYP
.555
.565
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SEE DETAIL B
REF. DESIG 1
(REGISTER 1)
SEE DETAIL A
REF DESIG 2
(REGISTER 2
SEE DETAIL A
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3.245
3.235
4.425
4.415
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2.275
1.525
1.515
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SEE DETAIL E
CROSS HATCHED LUMINESCENT
AREAS TO BE CONTINUOUSLY LIT
250V 800 CYCLES WIRED TOGETHER
IN LIGHT AND BROUGHT OUT
ON PIN 157
REF DESIG 3
(REGISTER 3)
SEE DETAIL A
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R
4 PLACES
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.257
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.195
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R 6 PLACES
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MARK 0.06 HIGH WHITE
FOR REFERENCE ONLY
NOT TO BE MARKED
ON PART
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144
130
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102
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75
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31
21
11
12 EQUAL
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BSC = 1.500 BSC
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.125
TYP
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.125 BSC TYP
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.125
TYP
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.164
DIA
6 HOLES
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.115
R TYP
8 PLACES
15 EQUAL
SPACES AT .125
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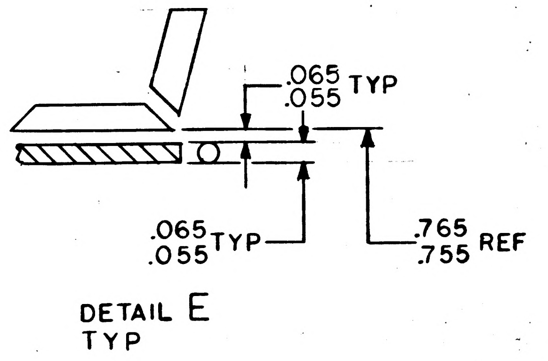

.065
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TYP
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TYP
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REF

DETAIL E
TYP

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

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SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	D. Wong DMS	29MAR65
CHECKED	J. Walkowicz JFM	31MAR65
APPROVED		
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315
SCALE NONE		SHEET 2 OF 2

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B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056 INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.

D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). NO MARKING SHALL APPEAR ON THE 32/ SURFACE.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSION: SHALL BE AS SHOWN.

(2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.

(3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.

(4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT INTENSITY: 15 FOOT-LAMBERTS MINIMUM INITIALLY WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.

(2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).

(3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 15.0 MA MAX.

(4) CASE GND (PIN NO. 158) TO ALL OTHER PINS RESISTANCE: NLT 10.0 MEGOHMS. CASE GND IS DEFINED AS ALUMINUM FRAME AND METAL LAMP CASE.

3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.

B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.

E. MATERIAL: ALUMINUM ALLOY.

F. RATINGS:

(1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).

(2) PEAK CONTINUOUS VOLTAGE: 420V MAX.

(3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.

G. FINISH:

(1) CHROMATE TREAT PER MIL-C-5541 (AL CASE).

(2) PAINT SURFACES MARKED "A" AND ALUM AREAS ON SURFACE "B" DARK GRAY PER ND 1002279 USING PAINT 1008809-1.

H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.

I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.

J. A GRAY REINFORCEMENT BAR ACROSS THE FRONT FACE OF THE DISPLAY IS PERMISSIBLE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

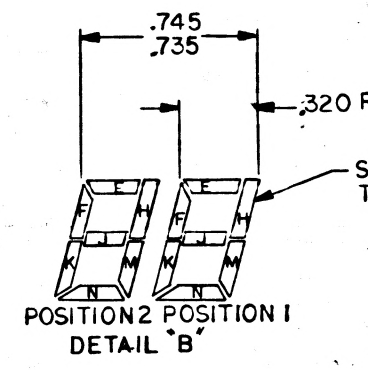
SEGMENT TO CONNECTOR PIN CHART

EXAMPLE: 3 2 J — REF DESIG (3), POSITION (2), SEGMENT (J)

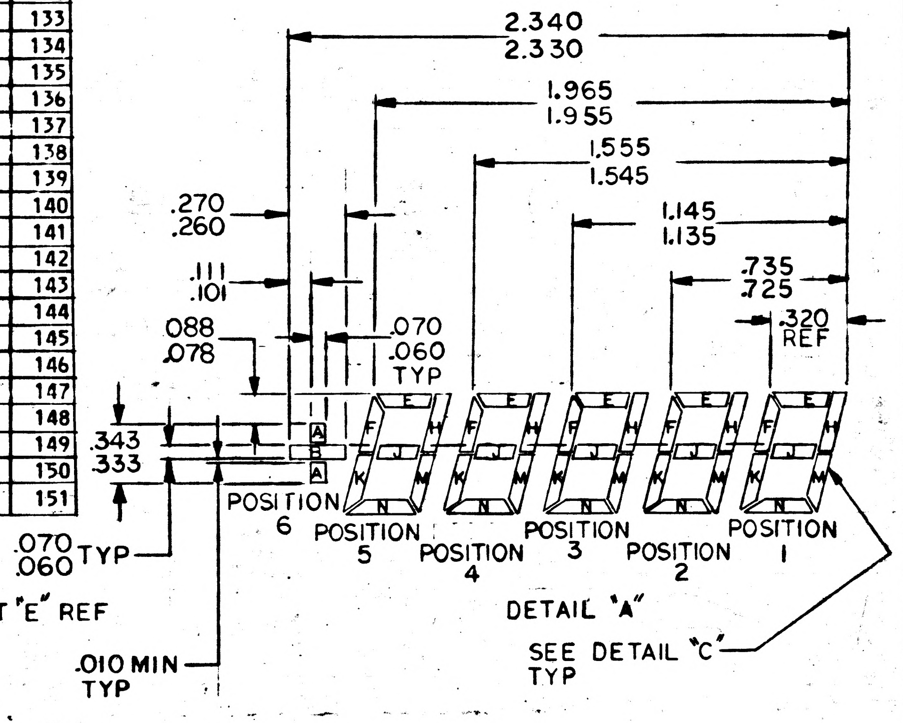
SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
31N	4	21N	41	11N	78	41N	115
31J	5	21J	42	11J	79	41J	116
31K	6	21K	43	11K	80	41K	117
31F	7	21F	44	11F	81	41F	118
32E	8	22E	45	12E	82	42E	119
32H	9	22H	46	12H	83	42H	120
32M	10	22M	47	12M	84	42M	121
32N	11	22N	48	12N	85	42N	122
32J	12	22J	49	12J	86	42J	123
32K	13	22K	50	12K	87	42K	124
32F	14	22F	51	12F	88	42F	125
33E	15	23E	52	13E	89	51E	126
33H	16	23H	53	13H	90	51H	127
33M	17	23M	54	13M	91	51M	128
33N	18	23N	55	13N	92	51N	129
33J	19	23J	56	13J	93	51J	130
33K	20	23K	57	13K	94	51K	131
33F	21	23F	58	13F	95	51F	132
34E	22	24E	59	14E	96	52E	133
34H	23	24H	60	14H	97	52H	134
34M	24	24M	61	14M	98	52M	135
34N	25	24N	62	14N	99	52N	136
34J	26	24J	63	14J	100	52J	137
34K	27	24K	64	14K	101	52K	138
34F	28	24F	65	14F	102	52F	139
35E	29	25E	66	15E	103	71E	140
35H	30	25H	67	15H	104	71H	141
35M	31	25M	68	15M	105	71M	142
35N	32	25N	69	15N	106	71N	143
35J	33	25J	70	15J	107	71J	144
35K	34	25K	71	15K	108	71K	145
35F	35	25F	72	15F	109	71F	146
36A	36	26A	73	16A	110	72E	147
36B	37	26B	74	16B	111	72H	148
61A	154	250V 800~	157	72K	152	72M	149
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

REVISIONS

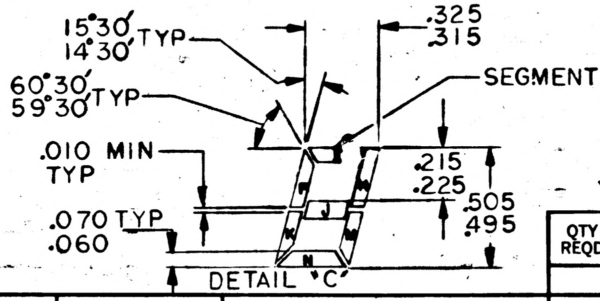
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793	EJ		12/28/65	WK
B		REVISED PER TDRR 28153	J.P.L.		4/26/66	WK



DETAIL "B"



DETAIL "A"



DETAIL "C"

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MASTER

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	D. Money	29 MAR 65
CHECKED	J. Wolkowicz	31 MAR 65
APPROVED		
APPROVED	Eldon C. Hall	27 May 65
APPROVED MIT	W. Kupfer	2 Jun 65
APPROVED MSC	T. Mitchell	6/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL, ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006315
SCALE NONE
SHEET 1 OF 2

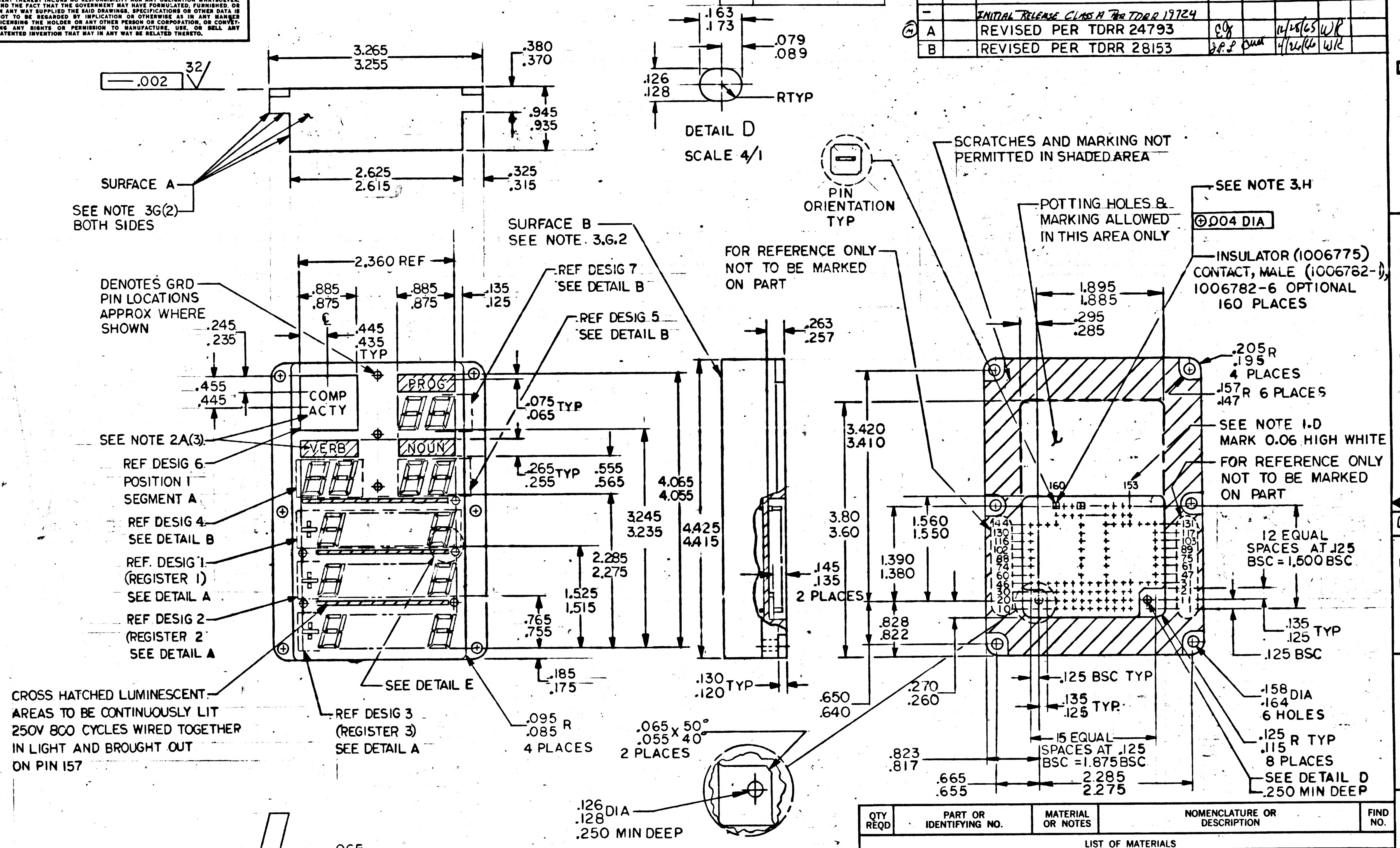
1006315 B

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006315

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 19724				
Ⓜ A		REVISED PER TDRR 24793	EG		12/28/65	WK
B		REVISED PER TDRR 28153	J.P.L		4/26/66	WK



.002
32
3.265
3.255
.380
.370
.945
.935
2.625
2.615
.325
.315
SURFACE A
SEE NOTE 3G(2) BOTH SIDES
.163
.173
.079
.089
.126
.128
RTYP
DETAIL D
SCALE 4/1
SCRATCHES AND MARKING NOT PERMITTED IN SHADED AREA
PIN ORIENTATION TYP
SEE NOTE 3.H
⊕ .004 DIA
POTTING HOLES & MARKING ALLOWED IN THIS AREA ONLY
INSULATOR (1006775)
CONTACT, MALE (1006782-1), 1006782-6 OPTIONAL
160 PLACES
SURFACE B
SEE NOTE 3.G.2
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
2.360 REF
DENOTES GRD PIN LOCATIONS APPROX WHERE SHOWN
.885
.875
.885
.875
.135
.125
.445
.435
TYP
.245
.235
REF DESIG 7
SEE DETAIL B
REF DESIG 5
SEE DETAIL B
.263
.257
1.895
1.885
.295
.285
.205
.195
R
4 PLACES
.157
.147
R 6 PLACES
COMP ACTY
PROG
VERB
NOUN
.455
.445
.075
.065
TYP
SEE NOTE 2A(3)
REF DESIG 6
POSITION 1
SEGMENT A
.265
.255
TYP
.555
.565
4.065
4.055
4.425
4.415
3.245
3.235
3.420
3.410
SEE NOTE 1.D
MARK 0.06 HIGH WHITE
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
160
153
REF DESIG 4
SEE DETAIL B
REF. DESIG 1
(REGISTER 1)
SEE DETAIL A
REF DESIG 2
(REGISTER 2
SEE DETAIL A
2.285
2.275
1.525
1.515
.765
.755
3.80
3.60
1.560
1.550
1.390
1.380
.145
.135
2 PLACES
.828
.822
144 130 116 102 88 74 60 46 30 20 10
131 117 103 89 75 61 47 31 21 1
12 EQUAL SPACES AT .125 BSC = 1.500 BSC
.135
.125
TYP
.125 BSC
.185
.175
.130
.120
TYP
SEE DETAIL E
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
REF DESIG 3
(REGISTER 3)
SEE DETAIL A
.095
.085
R
4 PLACES
.065 x 50°
.055 x 40°
2 PLACES
.650
.640
.270
.260
.125 BSC TYP
.135
.125
TYP
.158
.164
DIA
6 HOLES
.125
.115
R TYP
8 PLACES
SEE DETAIL D
.250 MIN DEEP
15 EQUAL SPACES AT .125 BSC = 1.875 BSC
.823
.817
.665
.655
2.285
2.275
.126
.128
DIA
.250 MIN DEEP
.065
.055
TYP
.065
.055
TYP
.765
.755
REF
DETAIL E
TYP

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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CAPACITOR VALUES ARE IN μf
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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Moung JMS 29MAR65
CHECKED J. Wolkowicz 31MAR65
APPROVED
APPROVED Eldon C Hall 27 May 65
APPROVED MIT W Kupfer 2 Jun 65
APPROVED MSC M Michael 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE
SHEET 2 OF 2

MASTER

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056 INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.
   - D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). NO MARKING SHALL APPEAR ON THE 32/ SURFACE.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSION: SHALL BE AS SHOWN.
     - (2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.
     - (3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.
     - (4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 15 FOOT-LAMBERTS MINIMUM INITIALLY WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 15.0 MA MAX.
     - (4) CASE GND (PIN NO. 158) TO ALL OTHER PINS RESISTANCE: NLT 10.0 MEGOHMS. CASE GND IS DEFINED AS ALUMINUM FRAME AND METAL LAMP CASE.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.- (1) AT 25°C.
   - B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.
   - E. MATERIAL: ALUMINUM ALLOY.
   - F. RATINGS:
     - (1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).
     - (2) PEAK CONTINUOUS VOLTAGE: 420V MAX.
     - (3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.
   - G. FINISH:
     - (1) CHROMATE TREAT PER MIL-C-5541 (AL CASE).
     - (2) PAINT SURFACES MARKED "A" AND ALUM AREAS ON SURFACE "B" DARK GRAY PER ND 1002279 USING PAINT 1008809-1.
     - (3) FINAL COAT SURFACES MARKED "A" AND ALUMINUM ARES ON SURFACE "B" PER ND1002277 USING 1012543-003
   - H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.
   - I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.
   - J. A GRAY REINFORCEMENT BAR ACROSS THE FRONT FACE OF THE DISPLAY IS PERMISSIBLE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SEGMENT TO CONNECTOR PIN CHART

EXAMPLE: 3 2 J — 3 = REF DESIG, 2 = POSITION, J = SEGMENT

SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
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33K	20	23K	57	13K	94	51K	131
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34E	22	24E	59	14E	96	52E	133
34H	23	24H	60	14H	97	52H	134
34M	24	24M	61	14M	98	52M	135
34N	25	24N	62	14N	99	52N	136
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35H	30	25H	67	15H	104	71H	141
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35N	32	25N	69	15N	106	71N	143
35J	33	25J	70	15J	107	71J	144
35K	34	25K	71	15K	108	71K	145
35F	35	25F	72	15F	109	71F	146
36A	36	26A	73	16A	110	72E	147
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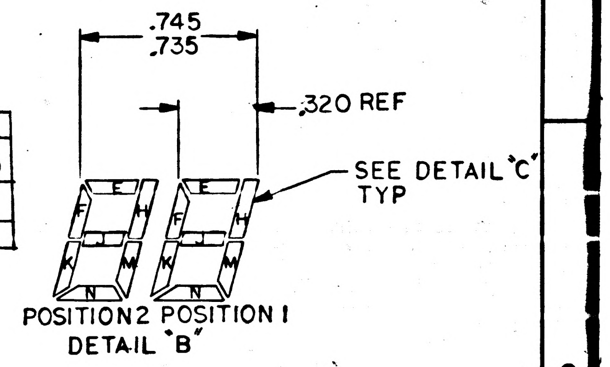
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

REVISIONS

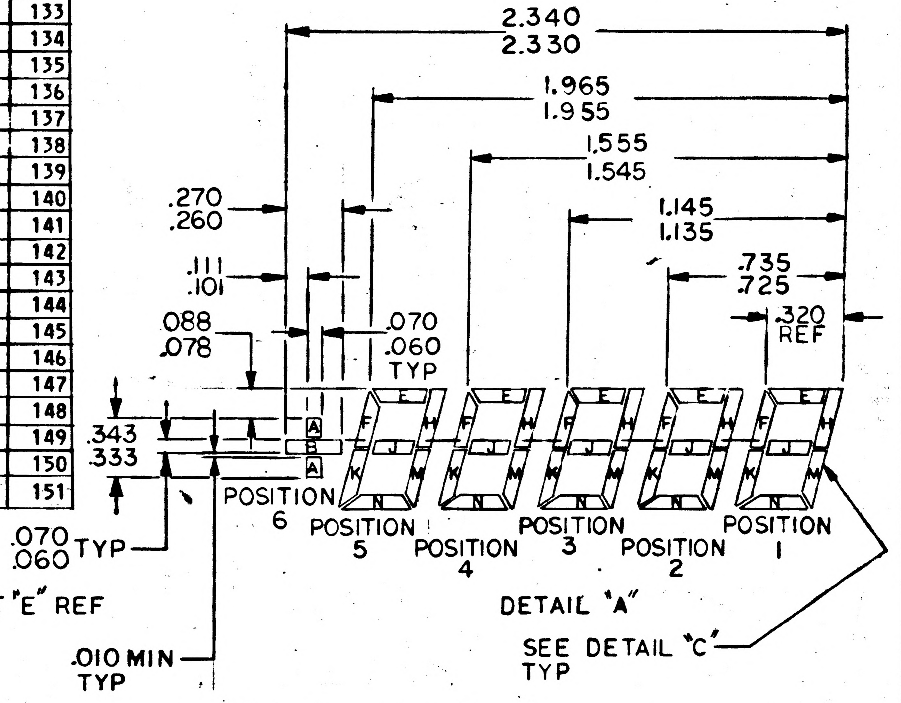
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793			11/28/65	WK
B		REVISED PER TDRR 28153	J.P.L.		4/26/66	WK
C		REVISED PER TDRR 28445			5/10/66	

NOTE APPLICATION

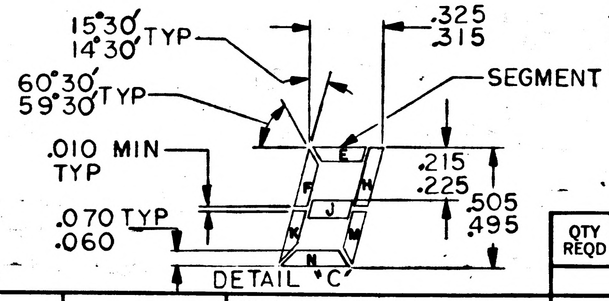
DASH NO	APPLICABLE NOTES
-001	1THRU 3
-000	1THRU 3 EXCEPT 3.G.(3)



DETAIL "B"



DETAIL "A"



DETAIL "C"

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
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CAPACITOR VALUES ARE IN µf
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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MASTER

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN		29MAR65
CHECKED		31MAR65
APPROVED		
APPROVED	Eldon C Hall	27May65
APPROVED MIT	W Kupfer	2Jun65
APPROVED MSC		6/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL, ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE SHEET 1 OF 2

1006315 C

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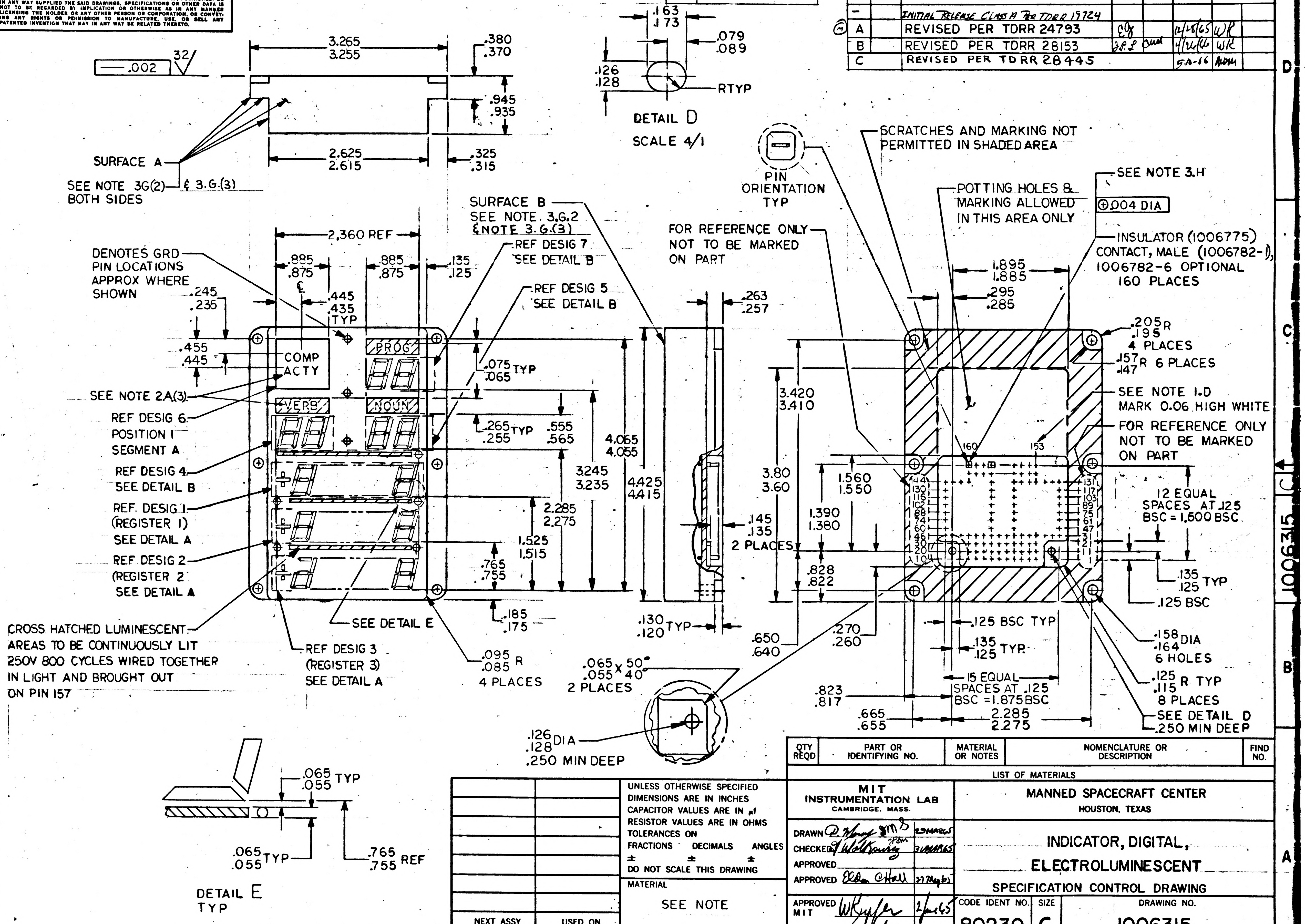
C 1006315

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
Ⓜ A		REVISED PER TDRR 24793	EJ		12/28/65	WK
B		REVISED PER TDRR 28153	J.P.L		4/26/66	WK
C		REVISED PER TDRR 28445			5-10-16	



.002
32
3.265
3.255
.380
.370
.945
.935
2.625
2.615
.325
.315
SURFACE A
SEE NOTE 3G(2) & 3.G.(3)
BOTH SIDES
.163
.173
.079
.089
.126
.128
RTYP
DETAIL D
SCALE 4/1
PIN ORIENTATION TYP
SCRATCHES AND MARKING NOT PERMITTED IN SHADED AREA
SEE NOTE 3.H
.004 DIA
POTTING HOLES & MARKING ALLOWED IN THIS AREA ONLY
INSULATOR (1006775)
CONTACT, MALE (1006782-1), 1006782-6 OPTIONAL
160 PLACES
SURFACE B
SEE NOTE 3.G.2
& NOTE 3.G.(3)
FOR REFERENCE ONLY
NOT TO BE MARKED
ON PART
REF DESIG 7
SEE DETAIL B
REF DESIG 5
SEE DETAIL B
2.360 REF
DENOTES GRD PIN LOCATIONS APPROX WHERE SHOWN
.885
.875
.885
.875
.135
.125
.245
.235
.445
.435
TYP
.455
.445
COMP
ACTY
PROG
VERB
NOUN
.075
.065 TYP
.265
.255 TYP
.555
.565
SEE NOTE 2A(3)
REF DESIG 6
POSITION 1
SEGMENT A
REF DESIG 4
SEE DETAIL B
REF. DESIG 1
(REGISTER 1)
SEE DETAIL A
REF DESIG 2
(REGISTER 2)
SEE DETAIL A
4.065
4.055
3.245
3.235
4.425
4.415
2.285
2.275
1.525
1.515
.765
.755
.185
.175
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
SEE DETAIL E
REF DESIG 3
(REGISTER 3)
SEE DETAIL A
.095
.085 R
4 PLACES
.263
.257
.145
.135
2 PLACES
.130
.120 TYP
.065
.055 x 50°
40°
2 PLACES
.126
.128 DIA
.250 MIN DEEP
3.420
3.410
3.80
3.60
1.560
1.550
1.390
1.380
.828
.822
.650
.640
.270
.260
1.895
1.885
.295
.285
.205
.195 R
4 PLACES
.157
.147 R 6 PLACES
SEE NOTE 1.D
MARK 0.06 HIGH WHITE
FOR REFERENCE ONLY
NOT TO BE MARKED
ON PART
160
153
144
130
116
102
88
74
60
46
30
20
10
131
117
103
89
75
61
47
21
1
12 EQUAL SPACES AT .125
BSC = 1.600 BSC
.135
.125 TYP
.125 BSC
.125 BSC TYP
.135
.125 TYP
15 EQUAL SPACES AT .125
BSC = 1.875 BSC
.823
.817
.665
.655
2.285
2.275
.158
.164 DIA
6 HOLES
.125
.115 R TYP
8 PLACES
SEE DETAIL D
.250 MIN DEEP
.065
.055 TYP
.065
.055 TYP
.765
.755 REF
DETAIL E
TYP

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	D. Many	29MAR65
CHECKED	J. Wolkowicz	31MAR65
APPROVED		
APPROVED	Eldon C. Hall	27May65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC		6/2/65
		DATE

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315
SCALE NONE		SHEET 2 OF 2

MASTER

1006315 C

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056 INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.
   - D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). NO MARKING SHALL APPEAR ON THE 32/ SURFACE.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSION: SHALL BE AS SHOWN.
     - (2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.
     - (3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.
     - (4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: PER TABLE WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 15.0 MA MAX.
     - (4) CASE GND (PIN NO. 158) TO ALL OTHER PINS RESISTANCE: NLT 10.0 MEGOHMS. CASE GND IS DEFINED AS ALUMINUM FRAME AND METAL LAMP CASE.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.
   - B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.
   - E. MATERIAL: ALUMINUM ALLOY.
   - F. RATINGS:
     - (1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).
     - (2) PEAK CONTINUOUS VOLTAGE: 420V MAX.
     - (3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.
   - G. FINISH:
     - (1) CHROMATE TREAT PER MIL-C-5541 (AL CASE)
     - (2) PAINT SURFACES MARKED "A" AND ALUM AREAS ON SURFACE "B" DARK GRAY PER ND 1002279 USING PAINT 1008809-1.
     - (3) FINAL COAT SURFACE MARKED "A" AND ALUMINUM ARES ON SURFACE "B" PER ND1002277 USING 1012543-003
   - H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.
   - I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.
   - J. A GRAY REINFORCEMENT BAR ACROSS THE FRONT FACE OF THE DISPLAY IS PERMISSIBLE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

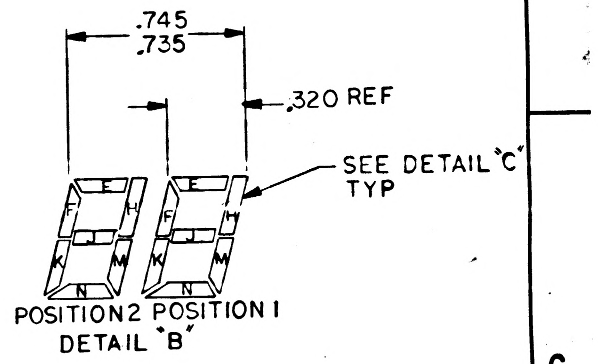
SEGMENT TO CONNECTOR PIN CHART

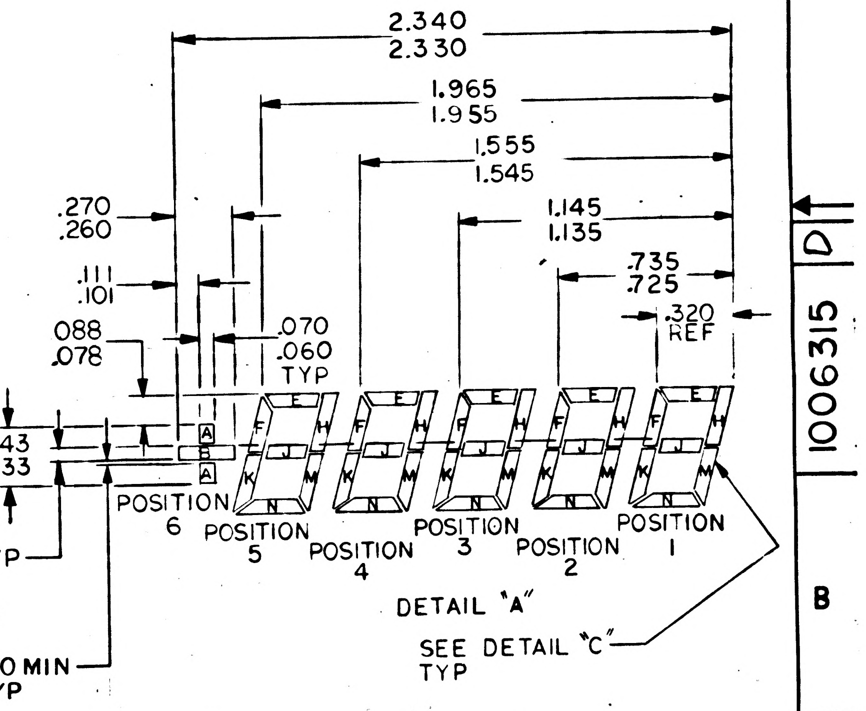
EXAMPLE: 3 2 J — REF DESIG (3), POSITION (2), SEGMENT (J)

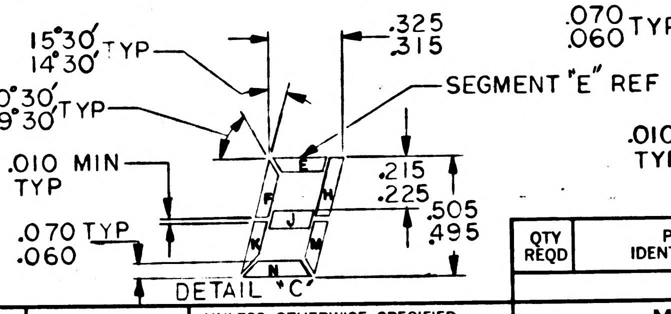
SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
31N	4	21N	41	11N	78	41N	115
31J	5	21J	42	11J	79	41J	116
31K	6	21K	43	11K	80	41K	117
31F	7	21F	44	11F	81	41F	118
32E	8	22E	45	12E	82	42E	119
32H	9	22H	46	12H	83	42H	120
32M	10	22M	47	12M	84	42M	121
32N	11	22N	48	12N	85	42N	122
32J	12	22J	49	12J	86	42J	123
32K	13	22K	50	12K	87	42K	124
32F	14	22F	51	12F	88	42F	125
33E	15	23E	52	13E	89	51E	126
33H	16	23H	53	13H	90	51H	127
33M	17	23M	54	13M	91	51M	128
33N	18	23N	55	13N	92	51N	129
33J	19	23J	56	13J	93	51J	130
33K	20	23K	57	13K	94	51K	131
33F	21	23F	58	13F	95	51F	132
34E	22	24E	59	14E	96	52E	133
34H	23	24H	60	14H	97	52H	134
34M	24	24M	61	14M	98	52M	135
34N	25	24N	62	14N	99	52N	136
34J	26	24J	63	14J	100	52J	137
34K	27	24K	64	14K	101	52K	138
34F	28	24F	65	14F	102	52F	139
35E	29	25E	66	15E	103	71E	140
35H	30	25H	67	15H	104	71H	141
35M	31	25M	68	15M	105	71M	142
35N	32	25N	69	15N	106	71N	143
35J	33	25J	70	15J	107	71J	144
35K	34	25K	71	15K	108	71K	145
35F	35	25F	72	15F	109	71F	146
36A	36	26A	73	16A	110	72E	147
36B	37	26B	74	16B	111	72H	148
61A	154	250V 800~	157	72K	152	72M	149
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793	EJ		12/28/65	WK
B		REVISED PER TDRR 28153	JPL		4/26/66	WK
C		REVISED PER TDRR 28445			5/10/66	
D		REVISED PER TDRR 31697	WA		1 NOV 66	







QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Morey 29 MAR 65
CHECKED 31 MAR 65
APPROVED
APPROVED Elder C Hall 27 May 65
APPROVED MIT W Kupfer
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

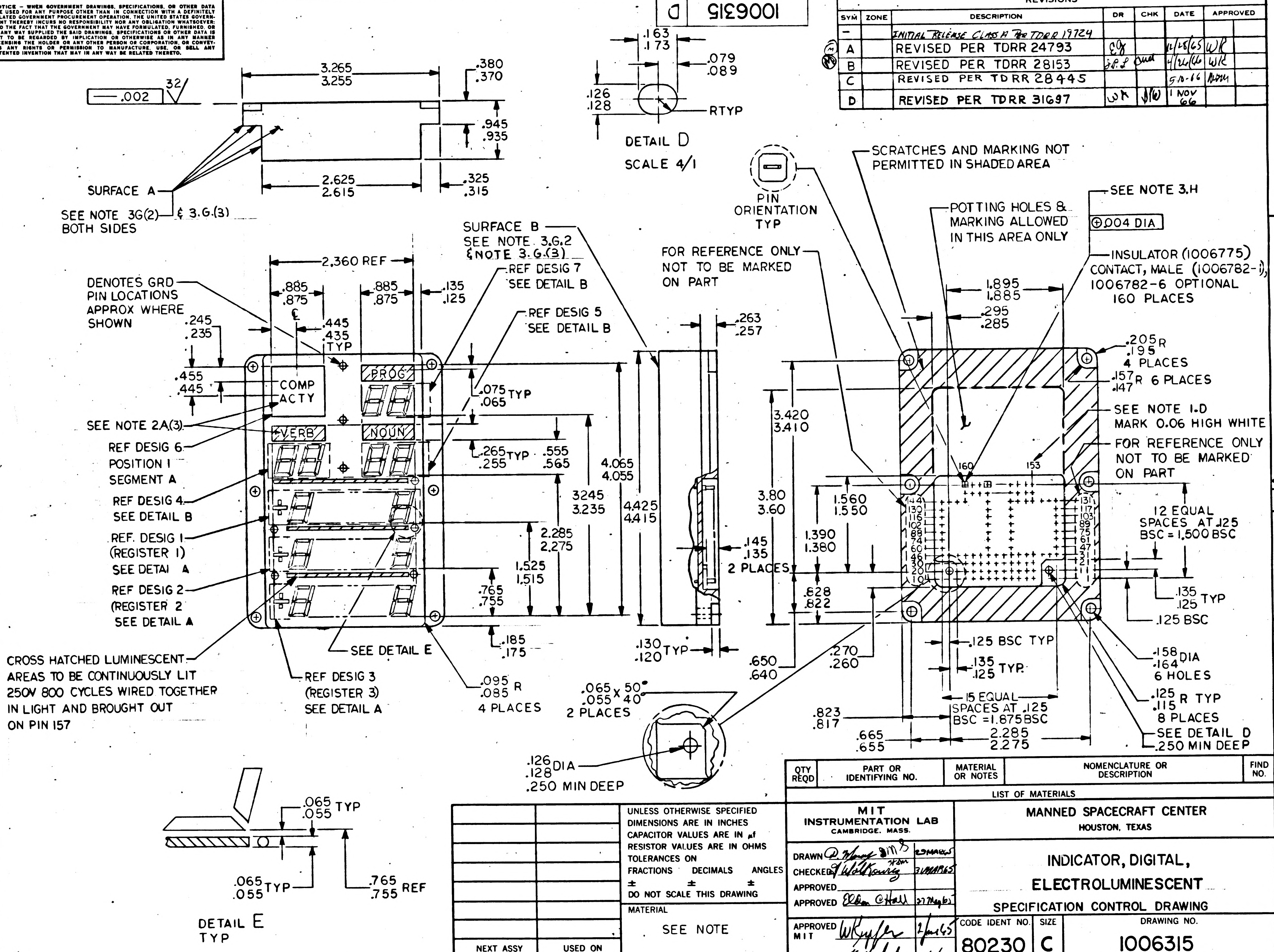
CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006315
SCALE NONE
SHEET 1 OF 3

1006315 D

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006315 D

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		~~INITIAL RELEASE CLASS A Per TDRR 19724~~				
A		REVISED PER TDRR 24793	EJ		12/28/65	WR
B		REVISED PER TDRR 28153	J.P.L		4/26/66	WR
C		REVISED PER TDRR 28445			5-10-66	
D		REVISED PER TDRR 31697	WA		1 NOV 66	


4
3
2
1
D
C
B
A
—.002
32
3.265
3.255
.380
.370
.945
.935
2.625
2.615
.325
.315
SURFACE A
SEE NOTE 3G(2) & 3.G.(3)
BOTH SIDES
.163
.173
.079
.089
.126
.128
RTYP
DETAIL D
SCALE 4/1
PIN ORIENTATION TYP
SCRATCHES AND MARKING NOT PERMITTED IN SHADED AREA
SEE NOTE 3.H
⊕.004 DIA
POTTING HOLES & MARKING ALLOWED IN THIS AREA ONLY
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
INSULATOR (1006775)
CONTACT, MALE (1006782-1), 1006782-6 OPTIONAL
160 PLACES
SURFACE B
SEE NOTE 3.G.2 & NOTE 3.G.(3)
2.360 REF
.885
.875
.885
.875
.135
.125
REF DESIG 7
SEE DETAIL B
REF DESIG 5
SEE DETAIL B
DENOTES GRD PIN LOCATIONS APPROX WHERE SHOWN
.245
.235
.445
.435
TYP
.455
.445
COMP ACTY
PROG
VERB
NOUN
.075
.065
TYP
.265
.255
TYP
.555
.565
SEE NOTE 2A(3)
REF DESIG 6
POSITION I
SEGMENT A
REF DESIG 4
SEE DETAIL B
REF. DESIG 1
(REGISTER 1)
SEE DETAIL A
REF DESIG 2
(REGISTER 2
SEE DETAIL A
3245
3.235
4.065
4.055
4.425
4.415
2.285
2.275
1.525
1.515
.765
.755
.185
.175
SEE DETAIL E
REF DESIG 3
(REGISTER 3)
SEE DETAIL A
.095
.085
R
4 PLACES
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
.263
.257
.145
.135
2 PLACES
.130
.120
TYP
.065
.055
x 50°
40°
2 PLACES
.126
.128
DIA
.250 MIN DEEP
1.895
1.885
.295
.285
.205
.195
R
4 PLACES
.157
.147
R 6 PLACES
SEE NOTE 1.D
MARK 0.06 HIGH WHITE
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
3.420
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3.80
3.60
1.560
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1.390
1.380
.628
.822
.650
.640
.270
.260
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153
144
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116
102
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74
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46
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20
10
131
117
103
89
75
61
47
31
21
1
12 EQUAL SPACES AT .125 BSC = 1.500 BSC
.135
.125
TYP
.125 BSC
.125 BSC TYP
.135
.125
TYP
.158
.164
DIA
6 HOLES
15 EQUAL SPACES AT .125 BSC = 1.875 BSC
.125
.115
R TYP
8 PLACES
SEE DETAIL D
.250 MIN DEEP
.823
.817
.665
.655
2.285
2.275
.065
.055
TYP
.065
.055
TYP
.765
.755
REF
DETAIL E
TYP
1006315 D

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

		DATE
DRAWN	D. Wong	29MAR65
CHECKED	J. Wolkowicz	31MAR65
APPROVED		
APPROVED	Eldon C Hall	27 May 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC		6/4/65

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE
SHEET 2 OF 3

REVISIONS

ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD
	D	THIS SHEET ADDED PER TDRR 31697		1 NOV 66	WA / DW

NOTE APPLICATIONS

DASH NO.	APPLICABLE NOTES	REFLECTION FROM DISPLAY SURFACE (MAX.)	LIGHT INTENSITY (MIN.)	BACK GROUND COLOR	CONTRAST RATIO (MIN.)
000	1 THRU 3 EXCEPT 3.G.(3)	--	15 FOOT LAMBERTS INITIALLY	--	--
001	1 THRU 3	--	15 FOOT LAMBERTS INITIALLY	--	--
002	1 THRU 3	20% MAX.	7 FOOT LAMBERTS AFTER BURN-IN	BLACK	0.11 IN A 300 FOOT CANDLE AMBIENT

D THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS + −
3 PLACE DECIMALS + −
ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT
DRAWN D. MOUEY DATE 29 MAR 65
CHECKED G. WOLKOUREZ 31 MAR 65
APPROVAL E. HALL 21 MAR 65
CONTRACT
~~NASA~~ MSC APPROVAL W. KEYFER 2 JUN 65
MIT APPROVAL W. MIRLAEH 2 JUN 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006315
SCALE
SHEET 3 OF 3

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   - D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). NO MARKING SHALL APPEAR ON THE 32/ SURFACE.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSION: SHALL BE AS SHOWN.
     - (2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.
     - (3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.
     - (4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: PER TABLE WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 15.0 MA MAX.
     - (4) CASE GND (PIN NO. 158) TO ALL OTHER PINS RESISTANCE: NLT 10.0 MEGOHMS. CASE GND IS DEFINED AS ALUMINUM FRAME AND METAL LAMP CASE.
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   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.
   - B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.
   - E. MATERIAL: ALUMINUM ALLOY.
   - F. RATINGS:
     - (1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).
     - (2) PEAK CONTINUOUS VOLTAGE: 420V MAX. (840V PEAK-PEAK 800CPS)
     - ~~(3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.~~
   - G. FINISH:
     - (1) CHROMATE TREAT PER MIL-C-5541 (AL CASE)
     - (2) PAINT SURFACES MARKED "A" AND ALUM AREAS ON SURFACE "B" DARK GRAY PER ND 1002279 USING PAINT 1008809-1.
     - (3) FINAL COAT SURFACE MARKED "A" AND ALUMINUM ARES ON SURFACE "B" PER ND1002277 USING 1012543-003
   - H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.
   - I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.
   - J. A GRAY REINFORCEMENT BAR ACROSS THE FRONT FACE OF THE DISPLAY IS PERMISSIBLE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

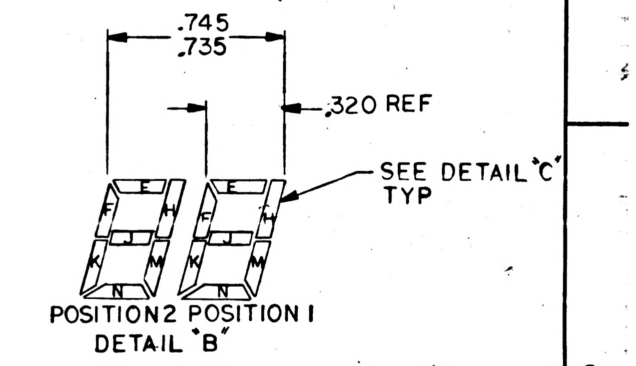
SEGMENT TO CONNECTOR PIN CHART

EXAMPLE: 3 2 J — REF DESIG (3), POSITION (2), SEGMENT (J)

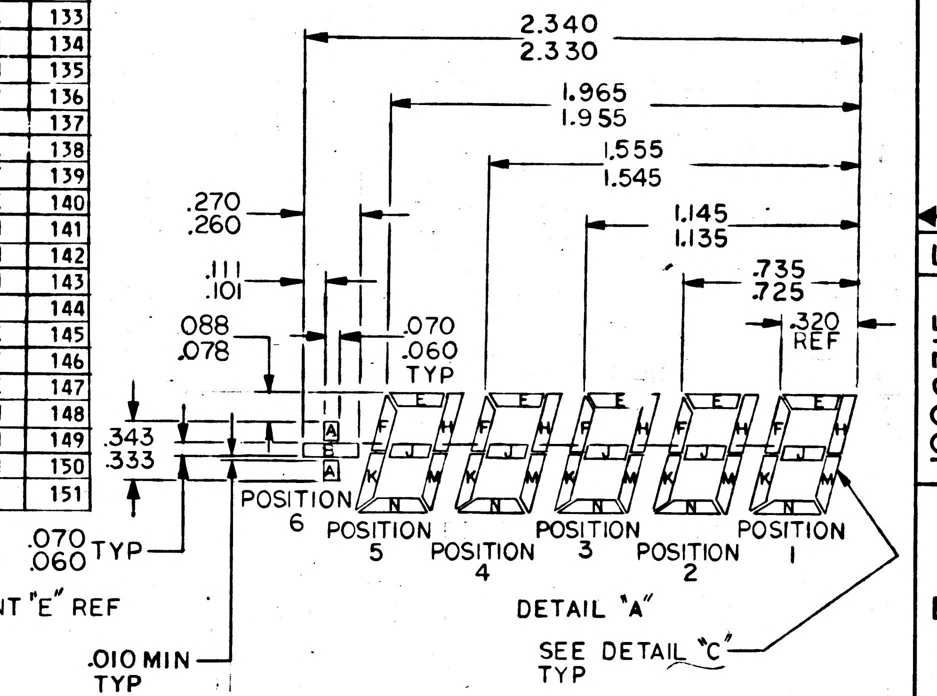
SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
31N	4	21N	41	11N	78	41N	115
31J	5	21J	42	11J	79	41J	116
31K	6	21K	43	11K	80	41K	117
31F	7	21F	44	11F	81	41F	118
32E	8	22E	45	12E	82	42E	119
32H	9	22H	46	12H	83	42H	120
32M	10	22M	47	12M	84	42M	121
32N	11	22N	48	12N	85	42N	122
32J	12	22J	49	12J	86	42J	123
32K	13	22K	50	12K	87	42K	124
32F	14	22F	51	12F	88	42F	125
33E	15	23E	52	13E	89	51E	126
33H	16	23H	53	13H	90	51H	127
33M	17	23M	54	13M	91	51M	128
33N	18	23N	55	13N	92	51N	129
33J	19	23J	56	13J	93	51J	130
33K	20	23K	57	13K	94	51K	131
33F	21	23F	58	13F	95	51F	132
34E	22	24E	59	14E	96	52E	133
34H	23	24H	60	14H	97	52H	134
34M	24	24M	61	14M	98	52M	135
34N	25	24N	62	14N	99	52N	136
34J	26	24J	63	14J	100	52J	137
34K	27	24K	64	14K	101	52K	138
34F	28	24F	65	14F	102	52F	139
35E	29	25E	66	15E	103	71E	140
35H	30	25H	67	15H	104	71H	141
35M	31	25M	68	15M	105	71M	142
35N	32	25N	69	15N	106	71N	143
35J	33	25J	70	15J	107	71J	144
35K	34	25K	71	15K	108	71K	145
35F	35	25F	72	15F	109	71F	146
36A	36	26A	73	16A	110	72E	147
36B	37	26B	74	16B	111	72H	148
61A	154	250V 800~	157	72K	152	72M	149
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

REVISIONS

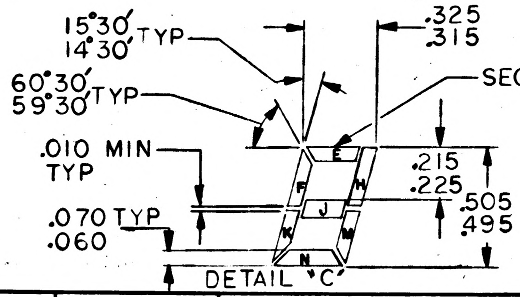
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793	EJ		12/28/65	WK
B		REVISED PER TDRR 28153	JPL		4/26/66	WK
C		REVISED PER TDRR 28445			5/10/66	
D		REVISED PER TDRR 31697	WA	MW	1 NOV 66	
E		REVISED PER TDRR 32952		EB	17 FEB 67	



DETAIL "B"



DETAIL "A"



DETAIL "C"

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE

M.I.T.
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	D. Money	29 MAR 65
CHECKED	J. Wolkowicz	31 MAR 65
APPROVED		
APPROVED	Eldon C Hall	27 May 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC		6/2/65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL, ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE SHEET 1 OF 3

1006315 E

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056 INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.
   - D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). NO MARKING SHALL APPEAR ON THE 32/ SURFACE.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSION: SHALL BE AS SHOWN.
     - (2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.
     - (3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.
     - (4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: PER TABLE WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 15.0 MA MAX.
     - (4) CASE GND (PIN NO. 158) TO ALL OTHER PINS RESISTANCE: NLT 10.0 MEGOHMS. CASE GND IS DEFINED AS ALUMINUM FRAME AND METAL LAMP CASE.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.
   - B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.
   - E. MATERIAL: ALUMINUM ALLOY.
   - F. RATINGS:
     - (1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).
     - (2) PEAK CONTINUOUS VOLTAGE: 420V MAX. (840V PEAK-PEAK 800CPS)
     - ~~(3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.~~
   - G. FINISH:
     - (1) CHROMATE TREAT PER MIL-C-5541 (AL CASE).
     - (2) PAINT SURFACES MARKED "A" AND ALUM AREAS ON SURFACE "B" DARK GRAY PER ND 1002279 USING PAINT 1008809-1.
     - (3) FINAL COAT SURFACES MARKED "A" AND ALUMINUM ARES ON SURFACE "B" PER ND1002277 USING 1012543-003
   - H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.
   - I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.
   - J. A GRAY REINFORCEMENT BAR ACROSS THE FRONT FACE OF THE DISPLAY IS PERMISSIBLE.

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SEGMENT TO CONNECTOR PIN CHART

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33K	20	23K	57	13K	94	51K	131
33F	21	23F	58	13F	95	51F	132
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35N	32	25N	69	15N	106	71N	143
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GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
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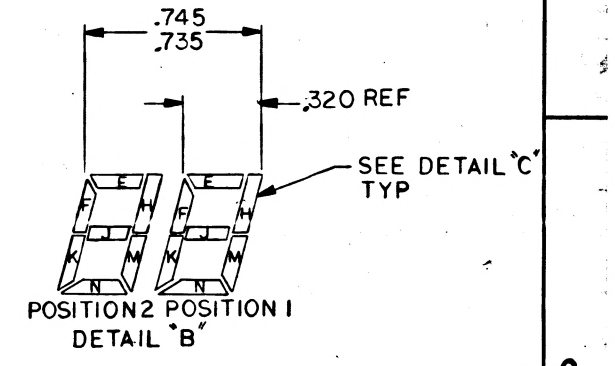
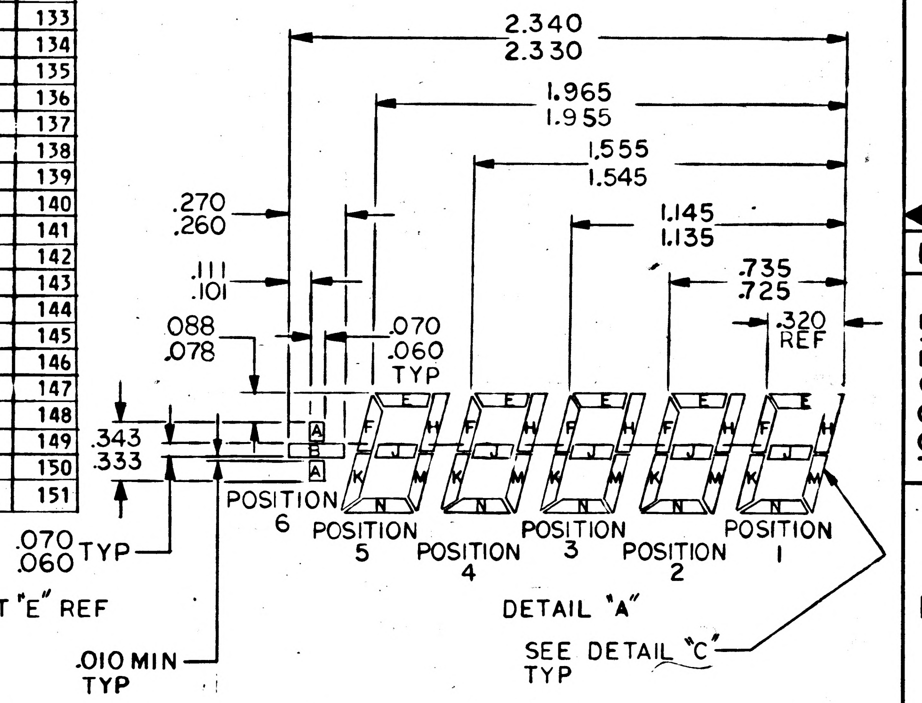
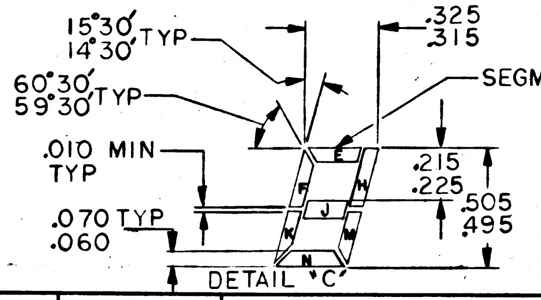
E		REVISED PER TDRR 32952			17 FEB 67	







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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

M.I.T.
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	D. Money	29MAR65
CHECKED		31MAR65
APPROVED		
APPROVED	Eldon C Hall	27May65
APPROVED MIT	W Kupfer	2Jun65
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE SHEET 1 OF 3

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E 1006315

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
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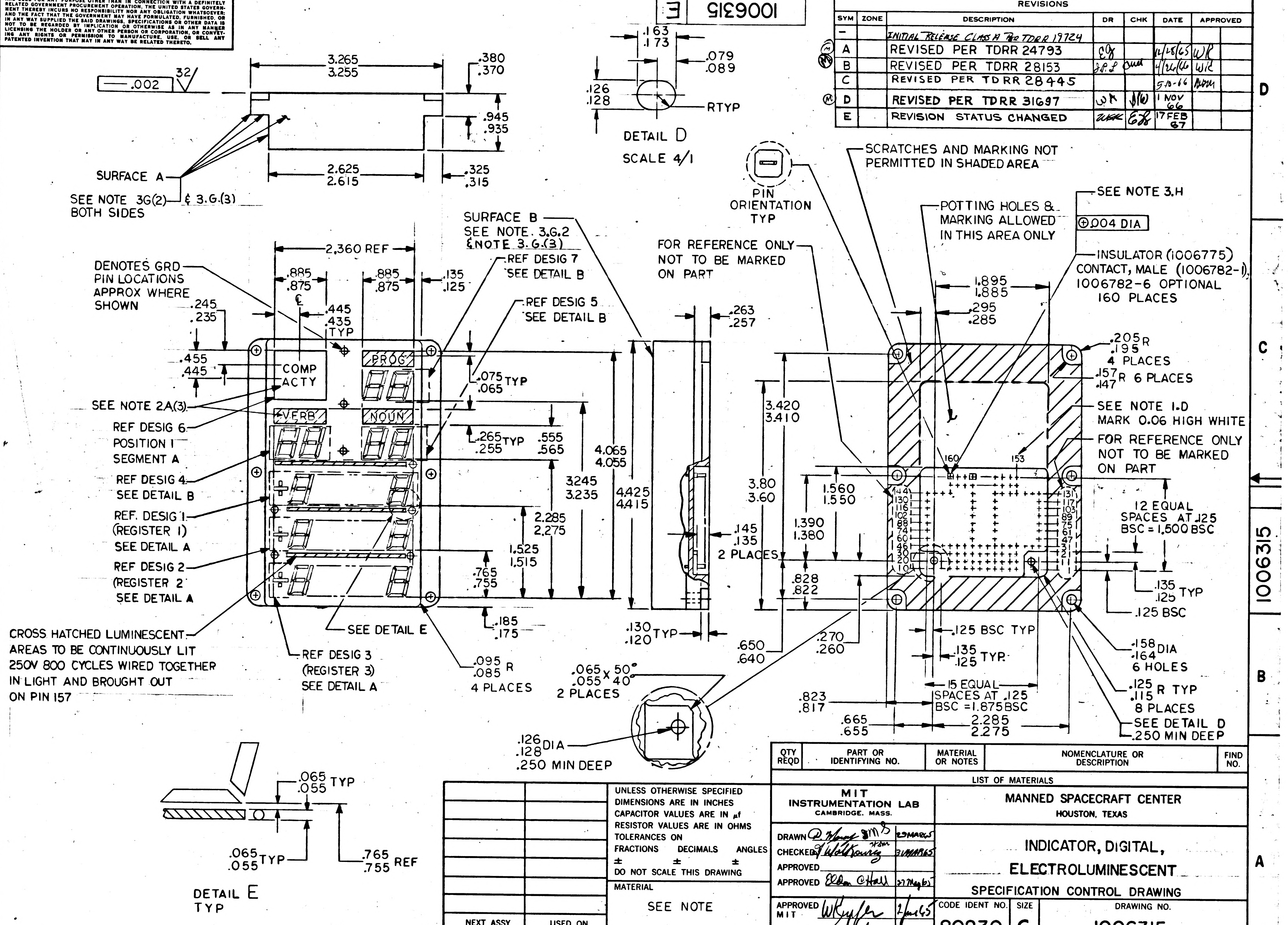
Ⓜ B		REVISED PER TDRR 28153	J.P.L		4/26/66	WK
C		REVISED PER TDRR 28445			5-10-66	
Ⓜ D		REVISED PER TDRR 31697	WA		1 NOV 66	
E		REVISION STATUS CHANGED			17 FEB 67	



4
3
2
1
D
C
B
A
.002
32
3.265
3.255
.380
.370
.945
.935
2.625
2.615
.325
.315
SURFACE A
SEE NOTE 3G(2) & 3.G.(3)
BOTH SIDES
.163
.173
.079
.089
.126
.128
RTYP
DETAIL D
SCALE 4/1
PIN ORIENTATION TYP
SCRATCHES AND MARKING NOT PERMITTED IN SHADED AREA
POTTING HOLES & MARKING ALLOWED IN THIS AREA ONLY
SEE NOTE 3.H
⊕.004 DIA
INSULATOR (1006775)
CONTACT, MALE (1006782-1), 1006782-6 OPTIONAL
160 PLACES
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
SURFACE B
SEE NOTE 3.G.2 & NOTE 3.G.(3)
REF DESIG 7 SEE DETAIL B
REF DESIG 5 SEE DETAIL B
2.360 REF
.885
.875
.885
.875
.135
.125
DENOTES GRD PIN LOCATIONS APPROX WHERE SHOWN
.245
.235
.445
.435
TYP
.455
.445
COMP ACTY
PROG
VERB
NOUN
SEE NOTE 2A(3)
REF DESIG 6
POSITION 1 SEGMENT A
REF DESIG 4 SEE DETAIL B
REF. DESIG 1 (REGISTER 1) SEE DETAIL A
REF DESIG 2 (REGISTER 2) SEE DETAIL A
.075
.065
TYP
.265
.255
TYP
.555
.565
4.065
4.055
3.245
3.235
4.425
4.415
2.285
2.275
1.525
1.515
.765
.755
.185
.175
SEE DETAIL E
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
REF DESIG 3 (REGISTER 3) SEE DETAIL A
.095
.085
R
4 PLACES
.263
.257
.145
.135
2 PLACES
.130
.120
TYP
.065 x 50°
.055 x 40°
2 PLACES
.126
.128
DIA
.250 MIN DEEP
1.895
1.885
.295
.285
.205
.195
R
4 PLACES
.157
.147
R 6 PLACES
SEE NOTE 1.D
MARK 0.06 HIGH WHITE
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
3.420
3.410
3.80
3.60
1.560
1.550
1.390
1.380
.828
.822
.650
.640
.270
.260
160
153
144
130
116
102
88
74
60
46
30
20
10
131
117
103
89
75
61
47
31
21
1
12 EQUAL SPACES AT .125 BSC = 1.500 BSC
.135
.125
TYP
.125 BSC
.125 BSC TYP
.135
.125
TYP
15 EQUAL SPACES AT .125 BSC = 1.875 BSC
.823
.817
.665
.655
2.285
2.275
.158
.164
DIA
6 HOLES
.125
.115
R TYP
8 PLACES
SEE DETAIL D
.250 MIN DEEP
.065
.055
TYP
.065
.055
TYP
.765
.755
REF
DETAIL E
TYP
1006315

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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE
SHEET 2 OF 3

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1006315 E

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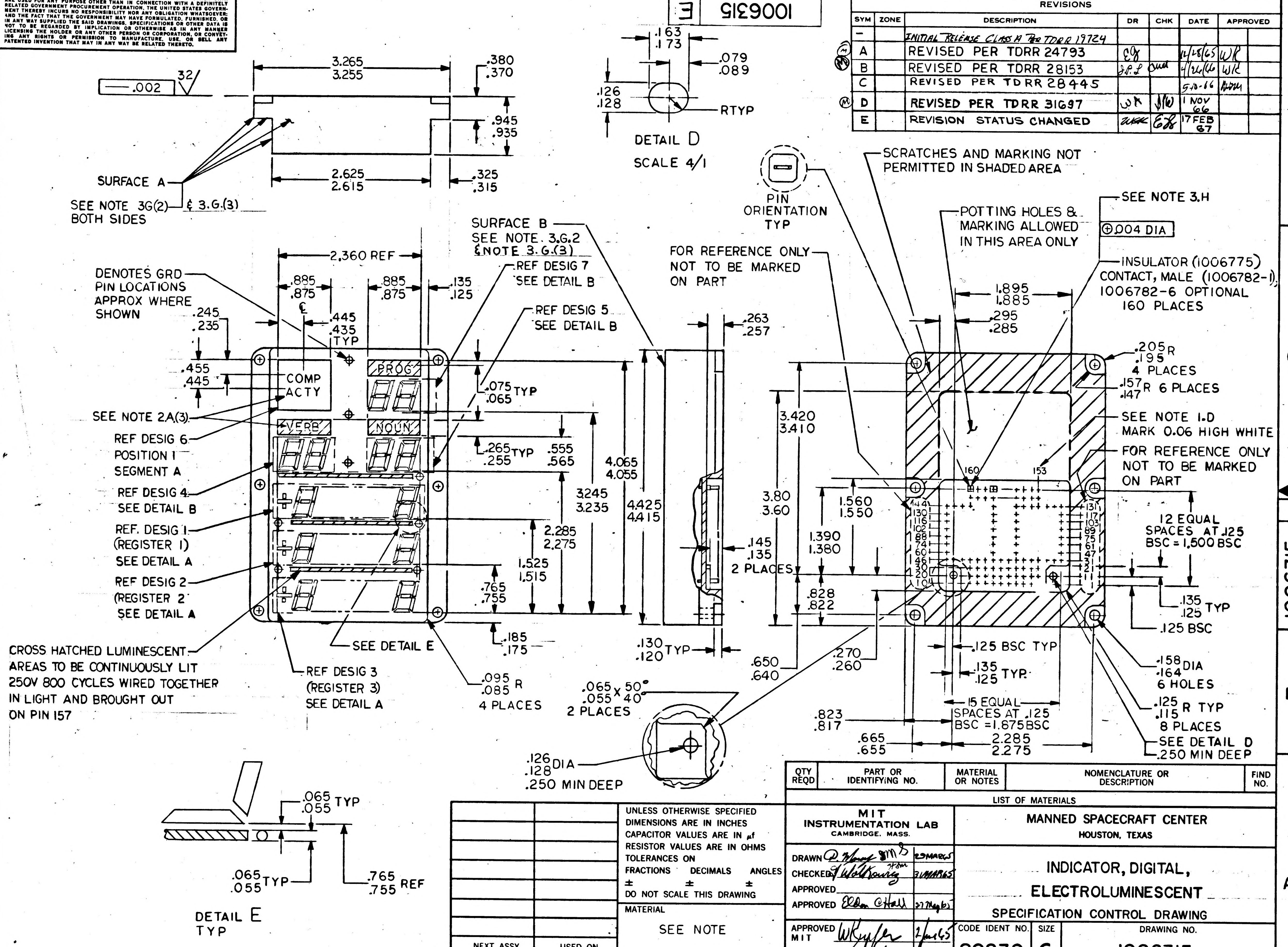

.002
32
3.265
3.255
.380
.370
.945
.935
2.625
2.615
.325
.315
SURFACE A
SEE NOTE 3G(2) & 3.G.(3) BOTH SIDES
.163
.173
.079
.089
.126
.128
R TYP
DETAIL D
SCALE 4/1
PIN ORIENTATION TYP
SCRATCHES AND MARKING NOT PERMITTED IN SHADED AREA
POTTING HOLES & MARKING ALLOWED IN THIS AREA ONLY
SEE NOTE 3.H
⊕.004 DIA
SURFACE B
SEE NOTE 3.G.2 & NOTE 3.G.(3)
REF DESIG 7 SEE DETAIL B
REF DESIG 5 SEE DETAIL B
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
2.360 REF
.885
.875
.135
.125
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.245
.235
.445
.435 TYP
.455
.445
COMP ACTY
PROG
VERB
NOUN
.075
.065 TYP
.265
.255 TYP
.555
.565
SEE NOTE 2A(3)
REF DESIG 6 POSITION 1 SEGMENT A
REF DESIG 4 SEE DETAIL B
REF. DESIG 1 (REGISTER 1) SEE DETAIL A
REF DESIG 2 (REGISTER 2) SEE DETAIL A
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
REF DESIG 3 (REGISTER 3) SEE DETAIL A
SEE DETAIL E
.095
.085 R
4 PLACES
4.065
4.055
3245
3.235
4.425
4.415
2.285
2.275
1.525
1.515
.765
.755
.185
.175
.263
.257
.145
.135
2 PLACES
.130
.120 TYP
.065 x 50°
.055 x 40°
2 PLACES
.126
.128 DIA
.250 MIN DEEP
3.420
3.410
3.80
3.60
1.560
1.550
1.390
1.380
.828
.822
.650
.640
.270
.260
.823
.817
.665
.655
1.895
1.885
.295
.285
.205
.195 R
4 PLACES
.157
.147 R 6 PLACES
SEE NOTE 1.D MARK 0.06 HIGH WHITE
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
INSULATOR (1006775)
CONTACT, MALE (1006782-1) 1006782-6 OPTIONAL 160 PLACES
160
153
144
130
116
102
88
74
60
46
30
20
10
131
117
103
89
75
61
47
21
1
12 EQUAL SPACES AT .125 BSC = 1.500 BSC
.135
.125 TYP
.125 BSC
.125 BSC TYP
.135
.125 TYP
15 EQUAL SPACES AT .125 BSC = 1.875 BSC
2.285
2.275
.158
.164 DIA
6 HOLES
.125
.115 R TYP
8 PLACES
SEE DETAIL D
.250 MIN DEEP
.065
.055 TYP
.065
.055 TYP
.765
.755 REF
DETAIL E
TYP

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 29MAR65
CHECKED 31MAR65
APPROVED
APPROVED Eldon C Hall 27May65
APPROVED MIT 2Jun65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE SHEET 2 OF 3

1006315

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD
	D	THIS SHEET ADDED PER TDRR 31697		INOV 66	WA / DW
	E	REVISION STATUS CHANGED		17 FEB 67	

NOTE APPLICATIONS

DASH NO.	APPLICABLE NOTES	REFLECTION FROM DISPLAY SURFACE (MAX.)	LIGHT INTENSITY (MIN.)	BACKGROUND COLOR	CONTRAST RATIO (MIN.)
000	1 THRU 3 EXCEPT 3.G.(3)	--	15 FOOT LAMBERTS INITIALLY	--	--
001	1 THRU 3	--	15 FOOT LAMBERTS INITIALLY	--	--
002	1 THRU 3	20% MAX.	7 FOOT LAMBERTS AFTER BURN-IN	BLACK	0.11 IN A 300 FOOT CANDLE AMBIENT

D THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS + −
3 PLACE DECIMALS + −
ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO.
CONTRACT
DRAWN D. MOUEY DATE 29 MAR 65
CHECKED G. WOLKOUREZ 31 MAR 65
APPROVAL E. HALL 21 MAR 65
CONTRACT
~~NASA~~ MSC APPROVAL W. KEYFER 2 JUN 65
MIT APPROVAL W. MIRLAEH 2 JUN 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006315
SCALE
SHEET 3 OF 3

1006315

E REV LTR 1006315

NOTE APPLICATIONS

DASH NO.	APPLICABLE NOTES	REFLECTION FROM DISPLAY SURFACE (MAX.)	LIGHT INTENSITY (MIN.)	BACKGROUND COLOR	CONTRAST RATIO (MIN.)
000	1 THRU 3 EXCEPT 3.G.(3)	--	15 FOOT LAMBERTS INITIALLY	--	--
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REVISIONS

ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD
	D	THIS SHEET ADDED PER TDRR 31697		1 NOV 66	WA / DW
	E	REVISION STATUS CHANGED		17 FEB 67	WGK / EJ

1006315

D THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN D. MOUEY DATE 29 MAR 65
CHECKED G. WOLKOUREZ 31 MAR 65
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CONTRACT
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MIT APPROVAL W. MIRLAEH 2 JUN 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006315
SCALE
SHEET 3 OF 3

MIL-1052C K

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REQUIREMENTS:

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B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056 INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.

D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). NO MARKING SHALL APPEAR ON THE 32/ SURFACE.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSION: SHALL BE AS SHOWN.

(2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.

(3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.

(4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT INTENSITY: PER TABLE. WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.

(2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).

(3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 15.0 MA MAX.

(4) CASE GND (PIN NO. 158) TO ALL OTHER PINS RESISTANCE: NLT 10.0 MEGOHMS. CASE GND IS DEFINED AS ALUMINUM FRAME AND METAL LAMP CASE.

3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.

B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.

E. MATERIAL: ALUMINUM ALLOY.

F. RATINGS:

(1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).

(2) PEAK CONTINUOUS VOLTAGE: 420V MAX. (840V PEAK-PEAK 800CPS)

~~(3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.~~

G. FINISH:

(1) CHROMATE TREAT PER MIL-C-5541 (AL CASE)

(2) PAINT SURFACES MARKED "A" AND ALUM AREAS ON SURFACE "B" DARK GRAY PER ND 1002279 USING PAINT 1008809-1.

(3) FINAL COAT SURFACE MARKED "A" AND ALUMINUM ARES ON SURFACE "B" PER ND 1002277 USING 1012543-003

H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.

I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.

J. A GRAY REINFORCEMENT BAR ACROSS THE FRONT FACE OF THE DISPLAY IS PERMISSIBLE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

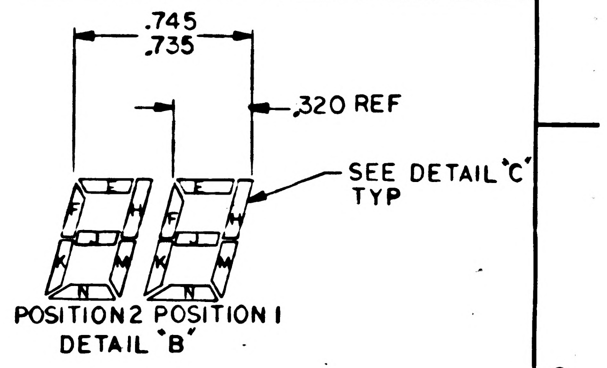
SEGMENT TO CONNECTOR PIN CHART

EXAMPLE: 3 2 J — REF DESIG (3), POSITION (2), SEGMENT (J)

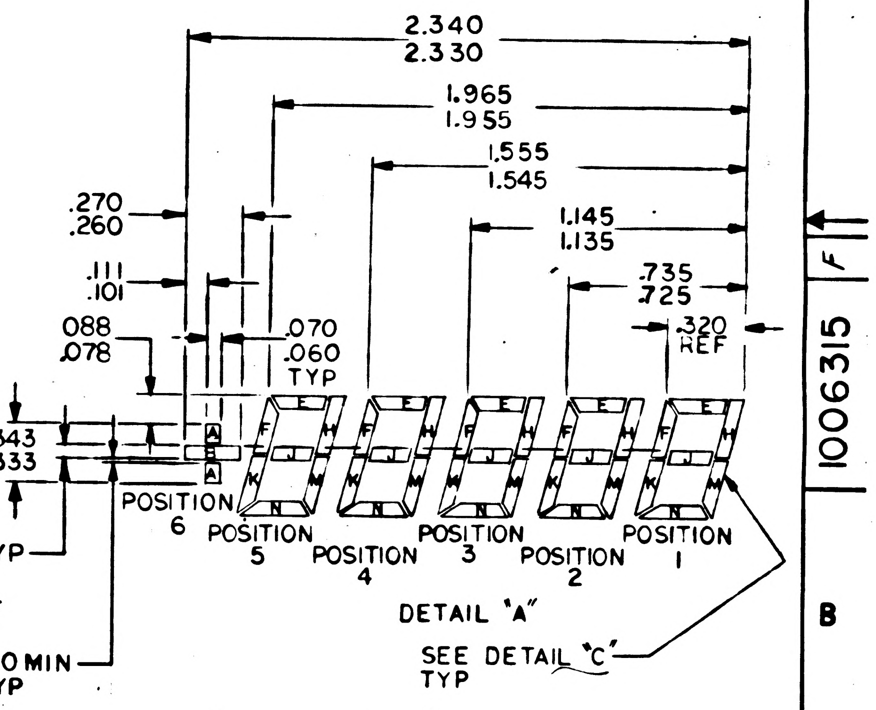
SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
31N	4	21N	41	11N	78	41N	115
31J	5	21J	42	11J	79	41J	116
31K	6	21K	43	11K	80	41K	117
31F	7	21F	44	11F	81	41F	118
32E	8	22E	45	12E	82	42E	119
32H	9	22H	46	12H	83	42H	120
32M	10	22M	47	12M	84	42M	121
32N	11	22N	48	12N	85	42N	122
32J	12	22J	49	12J	86	42J	123
32K	13	22K	50	12K	87	42K	124
32F	14	22F	51	12F	88	42F	125
33E	15	23E	52	13E	89	51E	126
33H	16	23H	53	13H	90	51H	127
33M	17	23M	54	13M	91	51M	128
33N	18	23N	55	13N	92	51N	129
33J	19	23J	56	13J	93	51J	130
33K	20	23K	57	13K	94	51K	131
33F	21	23F	58	13F	95	51F	132
34E	22	24E	59	14E	96	52E	133
34H	23	24H	60	14H	97	52H	134
34M	24	24M	61	14M	98	52M	135
34N	25	24N	62	14N	99	52N	136
34J	26	24J	63	14J	100	52J	137
34K	27	24K	64	14K	101	52K	138
34F	28	24F	65	14F	102	52F	139
35E	29	25E	66	15E	103	71E	140
35H	30	25H	67	15H	104	71H	141
35M	31	25M	68	15M	105	71M	142
35N	32	25N	69	15N	106	71N	143
35J	33	25J	70	15J	107	71J	144
35K	34	25K	71	15K	108	71K	145
35F	35	25F	72	15F	109	71F	146
36A	36	26A	73	16A	110	72E	147
36B	37	26B	74	16B	111	72H	148
61A	154	250V 800~	157	72K	152	72M	149
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

REVISIONS

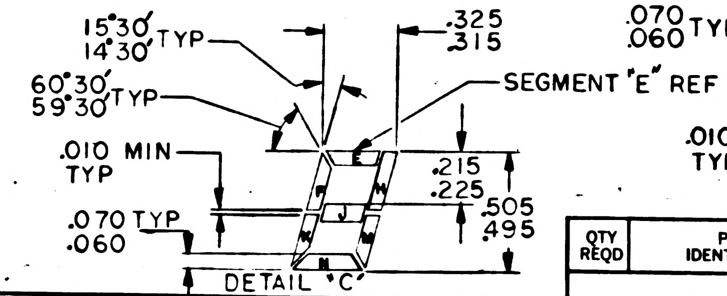
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 19124				
A		REVISED PER TDRR 24793			4/28/65	WK
B		REVISED PER TDRR 28153	J.P.L.		4/26/66	WK
C		REVISED PER TDRR 28445			5-10-66	
D		REVISED PER TDRR 31697	WA	MW	1 NOV 66	
E		REVISED PER TDRR 32952		EB	17 FEB 67	
F		REVISION STATUS CHANGED	JRK	RWH	6 SEP 67	



DETAIL "B"



DETAIL "A"



DETAIL "C"

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN		29 Mar 65
CHECKED		31 Mar 65
APPROVED		
APPROVED	Eldon C Hall	27 May 65
APPROVED MIT	W Kupfer	3 Jun 65
APPROVED MSC		6/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315
SCALE NONE		SHEET 1 OF 3

1006315 F

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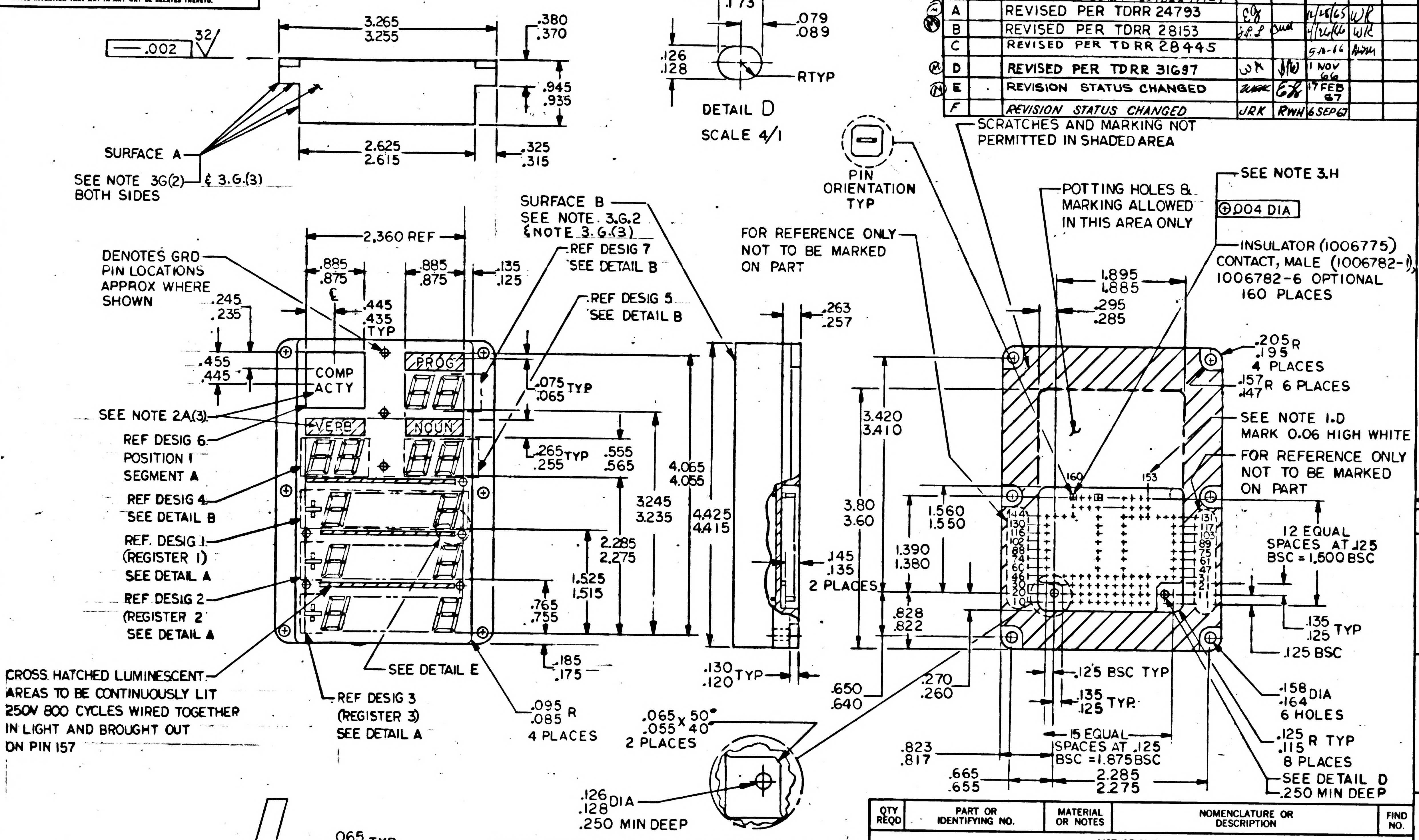
1006315 F

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793	EG		12/28/65	WK
B		REVISED PER TDRR 28153	J.P.L		4/26/66	WK
C		REVISED PER TDRR 28445			5-11-66	
D		REVISED PER TDRR 31697	WA		1 NOV 66	
E		REVISION STATUS CHANGED		EZ	17 FEB 67	
F		REVISION STATUS CHANGED	JRK	RWH	6 SEP 67	



.002
32
3.265
3.255
.380
.370
.945
.935
2.625
2.615
.325
.315
SURFACE A
SEE NOTE 3G(2) & 3.G.(3)
BOTH SIDES
.163
.173
.079
.089
.126
.128
RTYP
DETAIL D
SCALE 4/1
PIN ORIENTATION TYP
SCRATCHES AND MARKING NOT PERMITTED IN SHADED AREA
SURFACE B
SEE NOTE. 3.G.2 & NOTE 3.G.(3)
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
POTTING HOLES & MARKING ALLOWED IN THIS AREA ONLY
SEE NOTE 3.H
.004 DIA
INSULATOR (1006775)
CONTACT, MALE (1006782-1), 1006782-6 OPTIONAL
160 PLACES
2.360 REF
DENOTES GRD PIN LOCATIONS APPROX WHERE SHOWN
.885
.875
.135
.125
REF DESIG 7
SEE DETAIL B
.245
.235
.445
.435
TYP
REF DESIG 5
SEE DETAIL B
.263
.257
1.895
1.885
.295
.285
.205 R
.195
4 PLACES
.455
.445
COMP
ACTY
PROG
.075 TYP
.065
.157 R 6 PLACES
.147
SEE NOTE 2A(3)
VERB
NOUN
3.420
3.410
SEE NOTE 1.D
MARK 0.06 HIGH WHITE
REF DESIG 6
POSITION 1
SEGMENT A
.265 TYP
.255
.555
.565
4.065
4.055
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
160
153
REF DESIG 4
SEE DETAIL B
3.245
3.235
4.425
4.415
3.80
3.60
1.560
1.550
REF. DESIG 1
(REGISTER 1)
SEE DETAIL A
2.285
2.275
.145
.135
2 PLACES
1.390
1.380
12 EQUAL SPACES AT .125 BSC = 1.500 BSC
REF DESIG 2
(REGISTER 2)
SEE DETAIL A
1.525
1.515
.765
.755
.828
.822
.135
.125 TYP
.125 BSC
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
SEE DETAIL E
.185
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.270
.260
.125 BSC TYP
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.164 DIA
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(REGISTER 3)
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.095 R
.085
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.125
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.817
.665
.655
2.285
2.275
SEE DETAIL D
.250 MIN DEEP
.126
.128 DIA
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.055 TYP
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.755 REF
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TYP

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FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Mond 3MB 29MAR65
CHECKED J. Wolkonsky 31MAR65
APPROVED
APPROVED Eldon C. Hall 27 May 65
APPROVED MIT W Kupfer 2 Jun 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315

SCALE NONE — SHEET 2 OF 3

1006315 F

1006315

NOTE APPLICATIONS

DASH NO.	APPLICABLE NOTES	REFLECTION FROM DISPLAY SURFACE (MAX.)	LIGHT INTENSITY (MIN.)	BACKGROUND COLOR	CONTRAST RATIO (MIN.)
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REVISIONS

ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD
	D	THIS SHEET ADDED PER TDRR 31697		1NOV 66	WA
	E	REVISION STATUS CHANGED		17 FEB 67	
	F	REVISED PER TDRR 34495		6 SEP 67	JRK RWH

D THIS SHEET ADDED

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
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MATERIAL
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN D. MOHEY DATE 29 MAR 65
CHECKED G. Wol Kourez 31 MAR 65
APPROVAL E. HALL 21 MAR 65
CONTRACT
MSC APPROVAL W. KEYFER 2 JUN 65
MIT APPROVAL W. MIRLAEH 2 JUN 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006315
SCALE
SHEET 3 OF 3

1006315

MIL-1008C K

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E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSION: SHALL BE AS SHOWN.

(2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.

(3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.

(4) WHEN MOUNTED ON A SUITABLE FIXTURE, UNIT SHALL WITHSTAND PRESSURE OF 15 PSIG APPLIED AGAINST 32/ AREA.

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT INTENSITY: PER TABLE WHEN EXCITED WITH 250 ±2.5 VRMS, 800 ± 5 CPS.

(2) POWER FACTOR: 0.30 MAXIMUM WHEN EXCITED PER 2.B.(1).

(3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 15.0 MA MAX.

(4) CASE GND (PIN NO. 158) TO ALL OTHER PINS RESISTANCE: NLT 10.0 MEGOHMS. CASE GND IS DEFINED AS ALUMINUM FRAME AND METAL LAMP CASE.

3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°.

B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.

E. MATERIAL: ALUMINUM ALLOY.

F. RATINGS:

(1) LIGHT OUTPUT WAVELENGTH: 5300 ANGSTROMS (NOMINAL).

(2) PEAK CONTINUOUS VOLTAGE: 420V MAX. (840V PEAK-PEAK 800CPS)

~~(3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.~~

G. FINISH:

(1) CHROMATE TREAT PER MIL-C-5541 (AL CASE)

(2) PAINT SURFACES MARKED "A" AND ALUM AREAS ON SURFACE "B" DARK GRAY PER ND 1002279 USING PAINT 1008809-1.

(3) FINAL COAT SURFACES MARKED "A" AND ALUMINUM ARES ON SURFACE "B" PER ND 1002277 USING 1012543-003

H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND1002136.

I. BURN-IN (BY VENDOR): UNITS WHICH MEET INITIAL ELECT. REQUIREMENTS SHALL BE OPERATED FOR 100 HRS. AT ROOM TEMP. WHILE EXCITED PER 2.B.(1). BEFORE-AND-AFTER BURN-IN READING OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL BE TAKEN & SHIPPED WITH EACH PART.

J. A GRAY REINFORCEMENT BAR ACROSS THE FRONT FACE OF THE DISPLAY IS PERMISSIBLE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SEGMENT TO CONNECTOR PIN CHART

EXAMPLE: 3 2 J — 3 = REF DESIG, 2 = POSITION, J = SEGMENT

SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
31N	4	21N	41	11N	78	41N	115
31J	5	21J	42	11J	79	41J	116
31K	6	21K	43	11K	80	41K	117
31F	7	21F	44	11F	81	41F	118
32E	8	22E	45	12E	82	42E	119
32H	9	22H	46	12H	83	42H	120
32M	10	22M	47	12M	84	42M	121
32N	11	22N	48	12N	85	42N	122
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32F	14	22F	51	12F	88	42F	125
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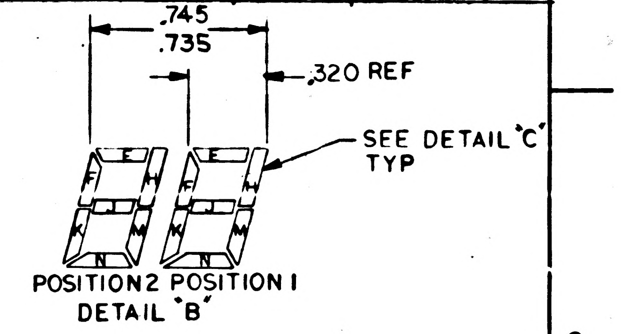
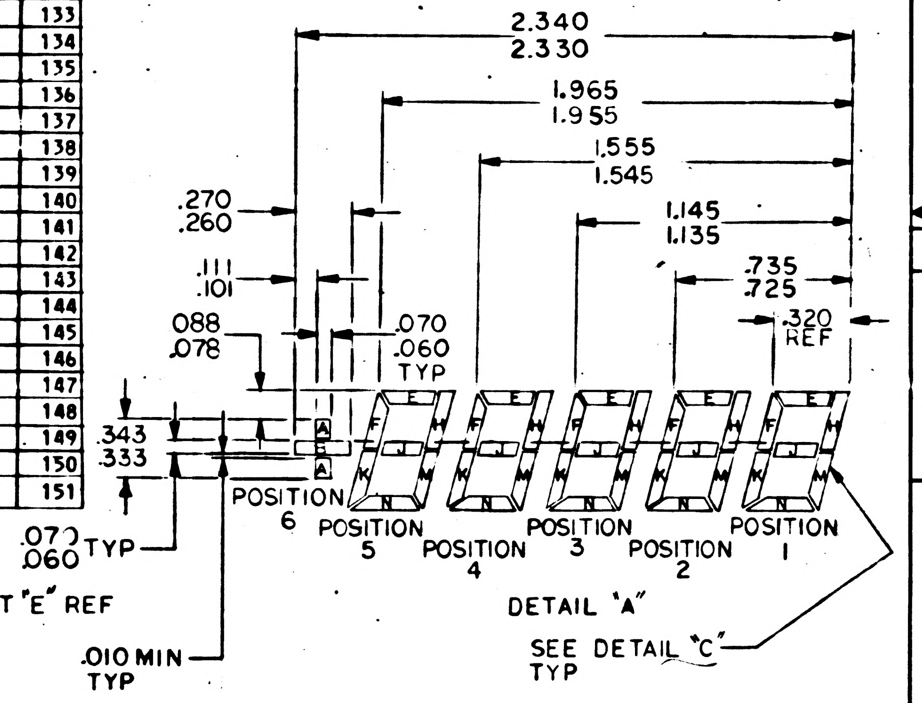
33H	16	23H	53	13H	90	51H	127
33M	17	23M	54	13M	91	51M	128
33N	18	23N	55	13N	92	51N	129
33J	19	23J	56	13J	93	51J	130
33K	20	23K	57	13K	94	51K	131
33F	21	23F	58	13F	95	51F	132
34E	22	24E	59	14E	96	52E	133
34H	23	24H	60	14H	97	52H	134
34M	24	24M	61	14M	98	52M	135
34N	25	24N	62	14N	99	52N	136
34J	26	24J	63	14J	100	52J	137
34K	27	24K	64	14K	101	52K	138
34F	28	24F	65	14F	102	52F	139
35E	29	25E	66	15E	103	71E	140
35H	30	25H	67	15H	104	71H	141
35M	31	25M	68	15M	105	71M	142
35N	32	25N	69	15N	106	71N	143
35J	33	25J	70	15J	107	71J	144
35K	34	25K	71	15K	108	71K	145
35F	35	25F	72	15F	109	71F	146
36A	36	26A	73	16A	110	72E	147
36B	37	26B	74	16B	111	72H	148
61A	154	250V 800~	157	72K	152	72M	149
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793			11/28/65	WK
B		REVISED PER TDRR 28153			4/14/66	WK
C		REVISED PER TDRR 28445			5-16-66	
D		REVISED PER TDRR 31697	WA		1 NOV 66	
E		REVISED PER TDRR 32952		EK	17 FEB 67	
F		REVISION STATUS CHANGED	JRK	RWH	6 SEP 67	
G		REVISED PER TDRR 36093	JJJ		29 APR 68	



DETAIL "B"



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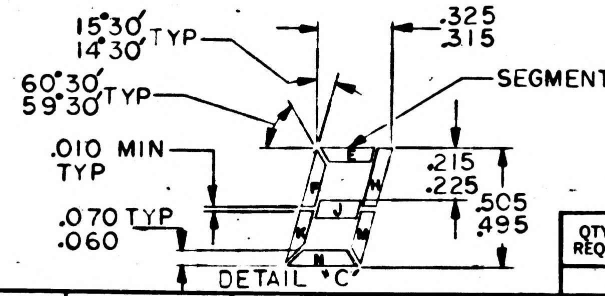


DETAIL "C"

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± . ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 29MAR65
CHECKED 31MAR65
APPROVED
APPROVED Eldon C Hall 27 May 65
APPROVED MIT W Kupfer
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006315
SCALE NONE
SHEET 1 OF 3

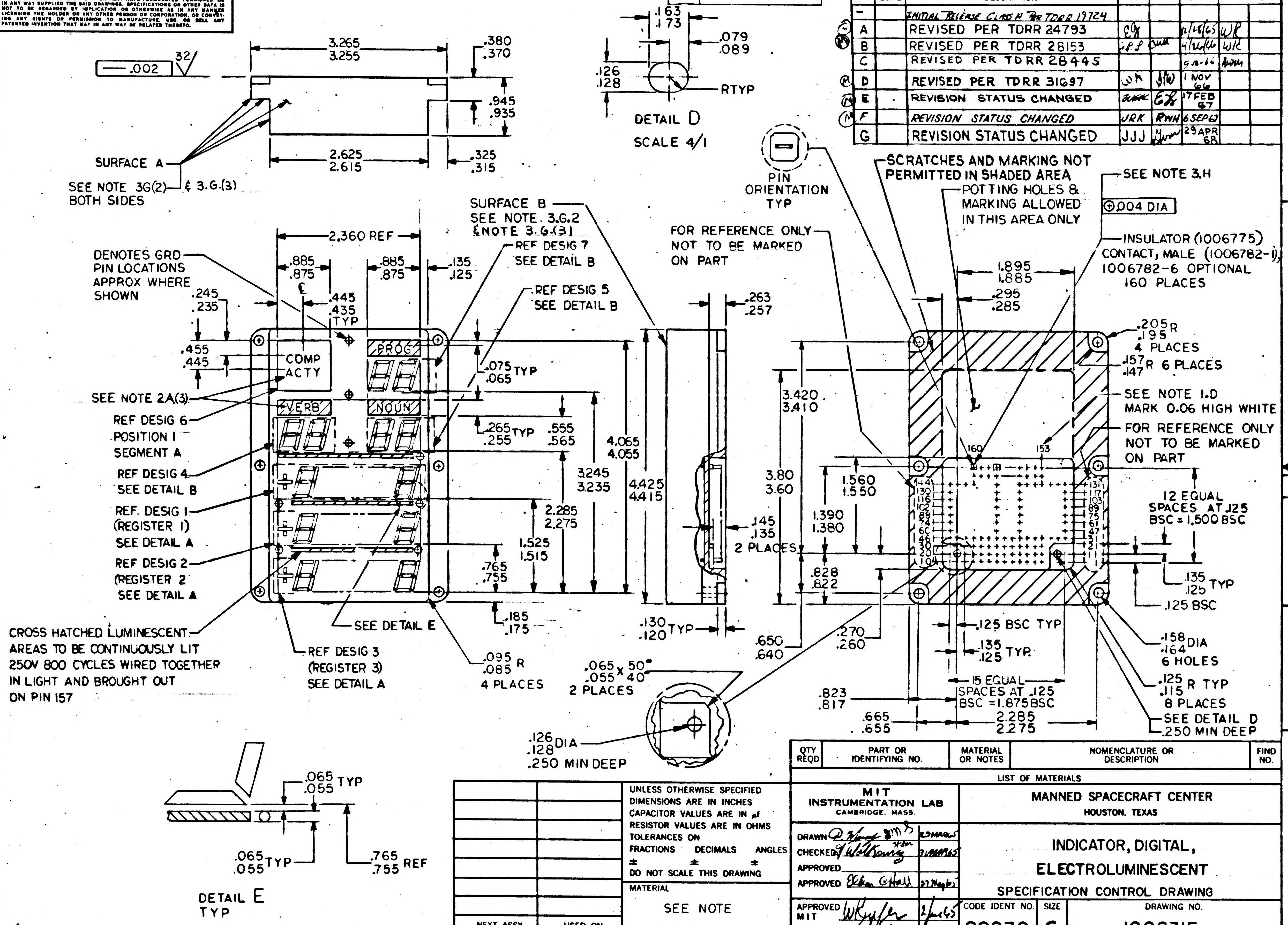
1006315 G

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006315 G

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 19724				
A		REVISED PER TDRR 24793			12/28/65	WK
B		REVISED PER TDRR 28153			4/26/66	WK
C		REVISED PER TDRR 28445			5-10-66	
D		REVISED PER TDRR 31697	WA		1 NOV 66	
E		REVISION STATUS CHANGED			17 FEB 67	
F		REVISION STATUS CHANGED	JRK	RWH	6 SEP 67	
G		REVISION STATUS CHANGED	JJJ		29 APR 68	



.002
32
3.265
3.255
.380
.370
.945
.935
2.625
2.615
.325
.315
SURFACE A
SEE NOTE 3G(2) ℄ 3.G.(3)
BOTH SIDES
.163
.173
.079
.089
.126
.128
RTYP
DETAIL D
SCALE 4/1
PIN ORIENTATION TYP
SCRATCHES AND MARKING NOT PERMITTED IN SHADED AREA
POTTING HOLES & MARKING ALLOWED IN THIS AREA ONLY
SEE NOTE 3.H
⊕.004 DIA
INSULATOR (1006775)
CONTACT, MALE (1006782-1), 1006782-6 OPTIONAL
160 PLACES
SURFACE B
SEE NOTE. 3.G.2
& NOTE 3.G.(3)
REF DESIG 7
SEE DETAIL B
REF DESIG 5
SEE DETAIL B
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
DENOTES GRD PIN LOCATIONS APPROX WHERE SHOWN
2.360 REF
.885
.875
.885
.875
.135
.125
.445
.435
TYP
.245
.235
.455
.445
COMP
ACTY
PROG
VERB
NOUN
.075
.065
TYP
SEE NOTE 2A(3)
REF DESIG 6
POSITION 1
SEGMENT A
REF DESIG 4
SEE DETAIL B
REF. DESIG 1
(REGISTER 1)
SEE DETAIL A
REF DESIG 2
(REGISTER 2
SEE DETAIL A
.265
.255
TYP
.555
.565
3.245
3.235
4.065
4.055
4.425
4.415
2.285
2.275
1.525
1.515
.765
.755
.185
.175
.263
.257
.145
.135
2 PLACES
.130
.120
TYP
3.420
3.410
3.80
3.60
.650
.640
1.895
1.885
.295
.285
.205
.195
R
4 PLACES
.157
.147
R 6 PLACES
SEE NOTE 1.D
MARK 0.06 HIGH WHITE
FOR REFERENCE ONLY NOT TO BE MARKED ON PART
160
153
144
130
116
102
88
74
60
46
30
20
10
131
117
103
89
75
61
47
31
1.560
1.550
1.390
1.380
.828
.822
12 EQUAL SPACES AT .125
BSC = 1.500 BSC
.135
.125
TYP
.125 BSC
.270
.260
.125 BSC TYP
.135
.125
TYP
.158
.164
DIA
6 HOLES
.125
.115
R TYP
8 PLACES
SEE DETAIL D
.250 MIN DEEP
15 EQUAL SPACES AT .125
BSC = 1.875 BSC
.823
.817
.665
.655
2.285
2.275
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
SEE DETAIL E
REF DESIG 3
(REGISTER 3)
SEE DETAIL A
.095
.085
R
4 PLACES
.065
.055
x
50°
40°
2 PLACES
.126
.128
DIA
.250 MIN DEEP
.065
.055
TYP
.065
.055
TYP
.765
.755
REF
DETAIL E
TYP
1006315 G

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Wang 29MAR65
CHECKED J. Wolkowicz 31MAR65
APPROVED
APPROVED Eldon C Hall 27 May 65
APPROVED MIT W Kupfer 2 Jun 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006315
SCALE NONE
SHEET 2 OF 3

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD
	D	THIS SHEET ADDED PER TDRR 31697		1NOV 66	WA
	E	REVISION STATUS CHANGED		17 FEB 67	
	F	REVISED PER TDRR 34495		6 SEP 67	JRK RWH
	G	REVISION STATUS CHANGED		29 APR 68	JJJ

NOTE APPLICATIONS

DASH NO.	APPLICABLE NOTES	REFLECTION FROM DISPLAY SURFACE (MAX.)	LIGHT INTENSITY (MIN.)	BACKGROUND COLOR	CONTRAST RATIO (MIN.)
000	1 THRU 3 EXCEPT 3.G.(3)	--	15 FOOT LAMBERTS INITIALLY, 12 FOOT LAMBERTS AFTER BURN-IN	--	--
001	1 THRU 3	--	15 FOOT LAMBERTS INITIALLY, 12 FOOT LAMBERTS AFTER BURN-IN	--	--
002	1 THRU 3	20% MAX.	7 FOOT LAMBERTS AFTER BURN-IN	BLACK	0.11 IN A 300 FOOT CANDLE AMBIENT

D THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ±
3 PLACE DECIMALS ±
ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT
DRAWN D. MOUEY DATE 29 MAR 65
CHECKED G. WOLKOUREZ 31 MAR 65
APPROVAL E. HALL 21 MAR 65
CONTRACT
MSC APPROVAL W. KEYFER 2 JUN 65
MIT APPROVAL W. MIRLAEH 2 JUN 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006315
SCALE
SHEET 3 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSION: SHALL BE AS SHOWN.
     - (2) SURFACE ROUGHNESS: 125√ UNLESS OTHERWISE SPECIFIED.
     - (3) LEGENDS: TO BE .125 HIGH BLACK CHARACTERS (FUTURA DEMIBOLD) PER ND 1002019 & ND 1002122.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 15 ± 3 FOOT-LAMBERTS MINIMUM INITIALLY WHEN EXCITED WITH 250 ± 10 VRMS, 800 ± 5 CPS.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL AREA ENERGIZED PER 2.B.(1): 11.0 MA MAXIMUM.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 60% OF ORIGINAL LIGHT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.
   - B. STORAGE LIFE: 1 YR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. ELECTROLUMINESCENT DISPLAYS SHALL BE HERMETICALLY SEALED.
   - E. MATERIAL: ALUMINUM ALLOY.
   - F. RATINGS:
     - (1) LIGHT OUTPUT WAVELENGTH: 5100 ANGSTROMS (NOMINAL).
     - (2) PEAK CONTINUOUS VOLTAGE: 420V MAX.
     - (3) PEAK TRANSIENT VOLTAGE: 500V MAX. SINE PULSE NOT TO EXCEED ONE-HALF CYCLE AT THE OPERATING FREQUENCY.
   - G. FINISH:
     - (1) CHROMATE TREAT PER MIL-C-5541 (AL CASE)
     - (2) PAINT SURFACES MARKED "A" BLACK EPOXY ENAMEL MIL-P-27316.
   - H. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND 1002136.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SEGMENT TO CONNECTOR PIN CHART

EXAMPLE
3 2 J
REF DESIG — 3
POSITION 2
SEGMENT — J

SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.	SEGMENT	PIN NO.
31E	1	21E	38	11E	75	41E	112
31H	2	21H	39	11H	76	41H	113
31M	3	21M	40	11M	77	41M	114
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33M	17	23M	54	13M	91	51M	128
33N	18	23N	55	13N	92	51N	129
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33K	20	23K	57	13K	94	51K	131
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34E	22	24E	59	14E	96	52E	133
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35H	30	25H	67	15H	104	71H	141
35M	31	25M	68	15M	105	71M	142
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35K	34	25K	71	15K	108	71K	145
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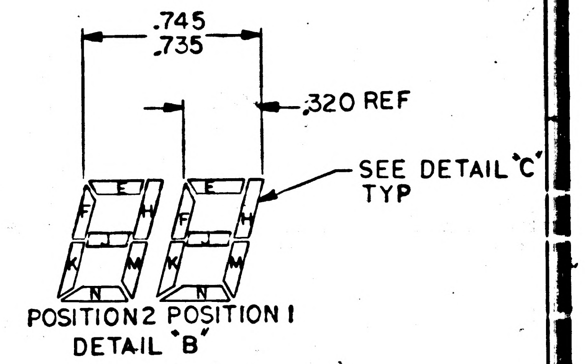
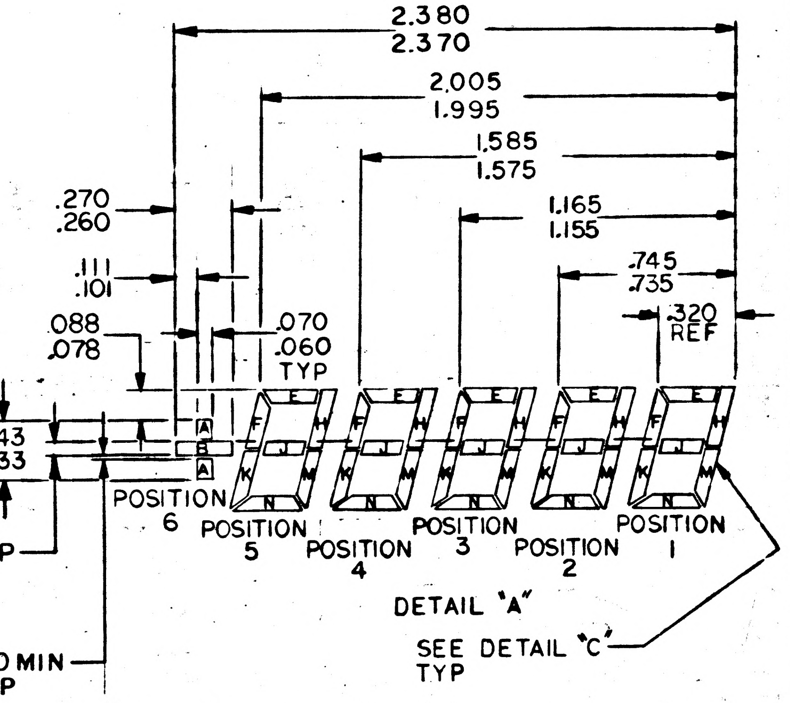
GRD	155	CASE GRD	158	72F	153	72N	150
GRD	156	SPARE	159	SPARE	160	72J	151

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
REVISIONS /						
—		INITIAL RELEASE CLASS A PER TDRR 197	24			



DETAIL "B"



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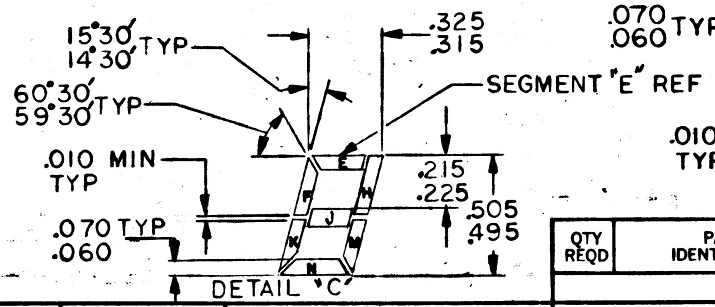


DETAIL "C"

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	D. Mon[illegible]	29MAR65
CHECKED	[illegible]	31MAR65
APPROVED		
APPROVED	Eldon C Hall	27May65
APPROVED MIT	W Kupfer	3Jun65
APPROVED MSC	[illegible]	6/2/65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL, ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

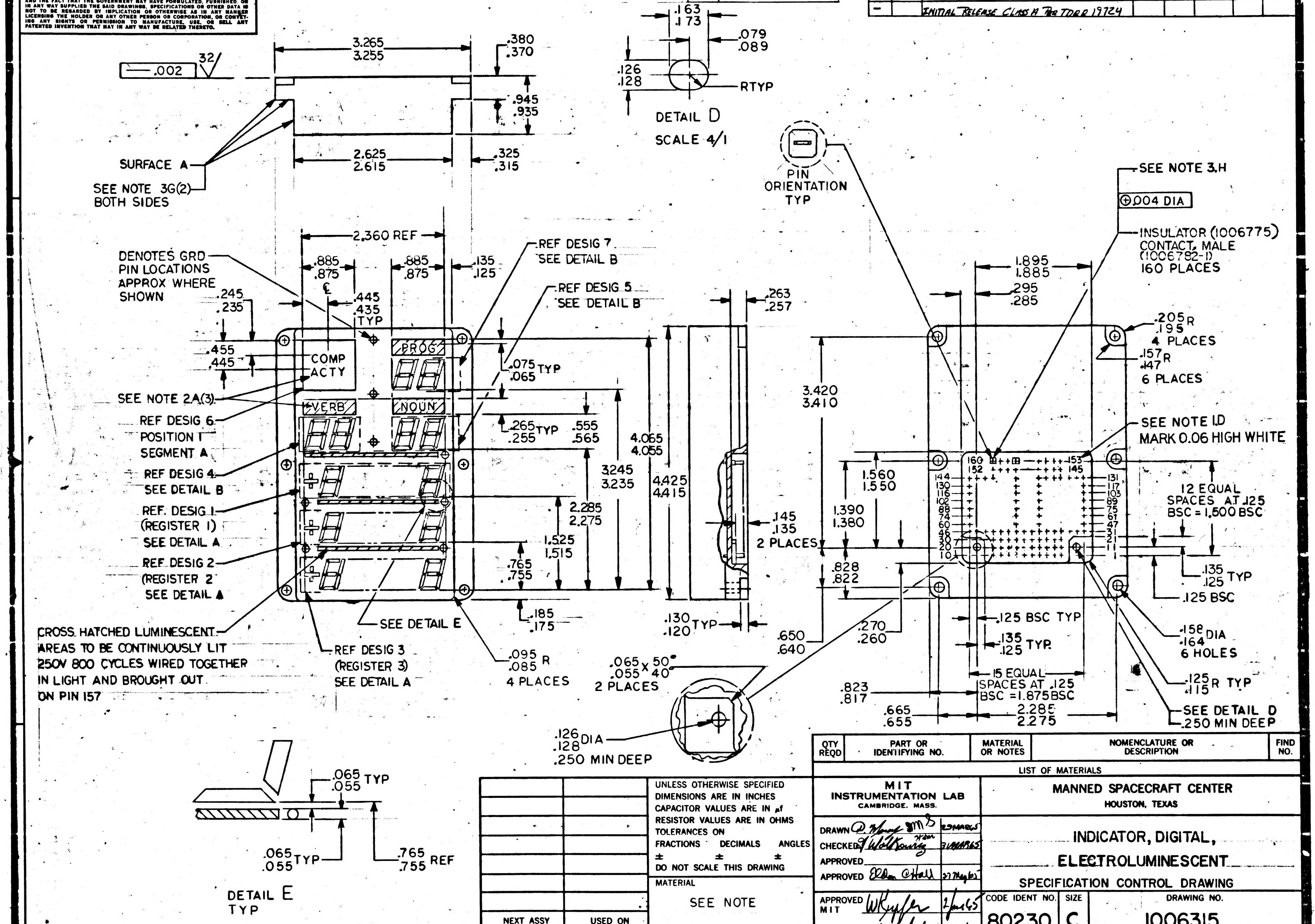
CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006315
SCALE NONE		SHEET 1 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006315

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 19724				



.002
32
3.265
3.255
.380
.370
.945
.935
SURFACE A
SEE NOTE 3G(2) BOTH SIDES
2.625
2.615
.325
.315
.163
.173
.079
.089
.126
.128
RTYP
DETAIL D
SCALE 4/1
PIN ORIENTATION TYP
SEE NOTE 3.H
⊕.004 DIA
INSULATOR (1006775)
CONTACT, MALE (1006782-1)
160 PLACES
1.895
1.885
.295
.285
.205
.195 R
4 PLACES
.157
.147 R
6 PLACES
DENOTES GRD PIN LOCATIONS APPROX WHERE SHOWN
2.360 REF
.885
.875
℄
.445
.435
TYP
.135
.125
.245
.235
REF DESIG 7
SEE DETAIL B
REF DESIG 5
SEE DETAIL B
.263
.257
.455
.445
COMP ACTY
PROG
VERB
NOUN
.075
.065 TYP
SEE NOTE 2A(3)
REF DESIG 6
POSITION 1
SEGMENT A
.265
.255 TYP
.555
.565
4.065
4.055
3.420
3.410
SEE NOTE 1.D
MARK 0.06 HIGH WHITE
REF DESIG 4
SEE DETAIL B
3.245
3.235
4.425
4.415
1.560
1.550
REF. DESIG 1
(REGISTER 1)
SEE DETAIL A
2.285
2.275
.145
.135
2 PLACES
1.390
1.380
12 EQUAL SPACES AT .125 BSC = 1.500 BSC
REF DESIG 2
(REGISTER 2
SEE DETAIL A
1.525
1.515
.765
.755
.828
.822
.135
.125 TYP
.125 BSC
160
152
153
145
144
130
116
102
88
74
60
46
30
20
10
131
117
103
89
75
61
47
31
21
11
1
CROSS HATCHED LUMINESCENT AREAS TO BE CONTINUOUSLY LIT 250V 800 CYCLES WIRED TOGETHER IN LIGHT AND BROUGHT OUT ON PIN 157
SEE DETAIL E
.185
.175
.130
.120 TYP
.270
.260
.650
.640
.125 BSC TYP
.135
.125 TYP
.158
.164 DIA
6 HOLES
REF DESIG 3
(REGISTER 3)
SEE DETAIL A
.095
.085 R
4 PLACES
.065 x 50°
.055 x 40°
2 PLACES
15 EQUAL SPACES AT .125 BSC = 1.875 BSC
.125
.115 R TYP
.823
.817
.665
.655
2.285
2.275
SEE DETAIL D
.250 MIN DEEP
.126
.128 DIA
.250 MIN DEEP
.065
.055 TYP
.065
.055 TYP
.765
.755 REF
DETAIL E
TYP

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Young 29MAR65
CHECKED J. Wolkowicz 31MAR65
APPROVED
APPROVED Eldon C Hall 27May65
APPROVED MIT W Kupfer 2June65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL,
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006315
SCALE NONE
SHEET 2 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 19724				

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056.

D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100%)

A. MECHANICAL AND PHYSICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) SURFACE ROUGHNESS: 125√ UNLESS OTHERWISE SPECIFIED.

(3) MARKING: AS SPECIFIED IN NOTES 1.D AND 1.E.

(4) PANEL COLOR AND MARKING:

COLOR, ENERGIZED: CROSS HATCHED LEGEND AREAS TO BE WHITE, ALL OTHER LEGEND AREAS TO BE YELLOW.

COLOR, UNENERGIZED: LEGEND BACKGROUND TO BE LOW REFLECTIVE, DIFFUSE, NEUTRAL GREY WHEN NOT ENERGIZED. CONTRAST BETWEEN BLACK CHARACTERS AND UNLIGHTED BACKGROUND SHALL BE BETWEEN 2 TO 4 UNITS IN ACCORDANCE WITH MIL-P-7788.

MARKING, LEGEND: .156 HIGH BLACK CHARACTERS GORTON CONDENSED PER ND 1002122 TYPE II, CLASS 2. FILL TO BE BLACK COLOR NO. 37038 PER FED-STD-595. WORDING TO BE CENTERED ON LEGEND.

(5) READABILITY: LEGEND BACKGROUNDS SHALL HAVE A BRIGHTNESS LEVEL OF 15 ± 3 FOOT-LAMBERTS AND THE LEGENDS MUST BE READABLE (WHEN ILLUMINATED) UNDER AN AMBIENT 50 FOOT CANDLE ILLUMINATION.

(6) ISOLATION: THERE SHALL BE NO LIGHT LEAKAGE FROM LIT TO UNLIT LEGEND AREAS. PAINT SHALL NOT BE DEEMED AN ADEQUATE LIGHT BLOCK.

B. ELECTRICAL CHARACTERISTICS:

(1) POWER DISSIPATION: EACH OF THE 14 LEGEND AREAS TO BE ILLUMINATED BY 3 LAMPS (MS24367-683) HAVING A CURRENT DRAIN OF 0.060 ± 0.006 AMPERES, AT 5.0 VDC, PER LAMP. MEASUREMENT TO BE MADE FOR EACH LEGEND – 0.180 ± 0.018 AMPERES.

(2) DIELECTRIC WITHSTANDING VOLTAGE: 200 ± 25 VRMS AT 60 CPS FOR 5 SECONDS BETWEEN ADJACENT LAMPS AND BETWEEN ANY LAMP AND THE CASE PER MIL-STD-202, METHOD 301.

(3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 100 VDC AT SEA LEVEL, 70° ± 10°F, 10% RH MAXIMUM, BETWEEN ADJACENT LAMPS AND BETWEEN ANY LAMP AND CASE PER MIL-STD-202, METHOD 302.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. OPERATING LIFE: 4000 HOURS MINIMUM AT RATED CURRENT AND VOLTAGE AT 70° ± 10°F AMBIENT TEMPERATURE.

B. MATERIAL: ALL MATERIAL SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF THIS DRAWING AND EXHIBIT NO TOXICITY.

(1) PLASTIC FACE PLATE: ACRYLIC SHEET PLASTIC PER MIL-P-5425, FINISH A.

(2) CASE: ALUMINUM ALLOY.

C. FINISH:

(1) CHROMATE TREAT PER MIL-C-5541 (AL CASE)

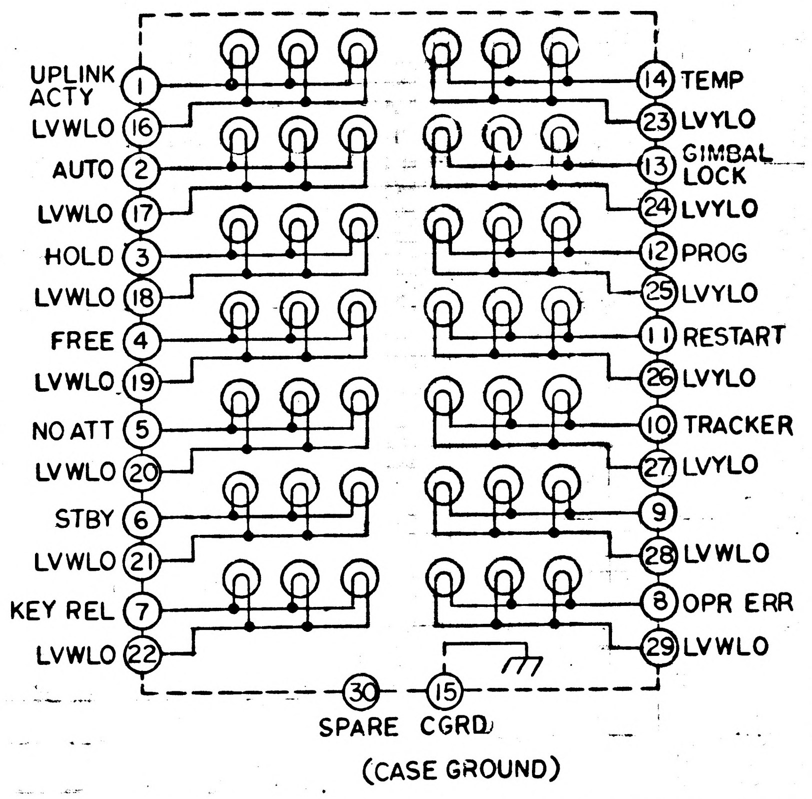
(2) PAINT SURFACES MARKED "A" BLACK EPOXY ENAMEL PER MIL-P-27316.

(3) PAINT TOP BORDER AREA MED GRAY EPOXY ENAMEL PER ND 1002110 USING 1010729-1.

D. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND 1002136.

E. PANEL COLORS: [REF NOTE 2.A.(4)] YELLOW COLOR TO BE AVIATION YELLOW AND WHITE COLOR TO BE AVIATION WHITE PER MIL-C-25050.

4. NOTE: THIS UNIT IS TO BE MOUNTED ON A HEAT SINK WHEN LEGENDS ARE ENERGIZED FOR PERIODS LONGER THAN TWO (2) MINUTES. A SATISFACTORY HEAT SINK CAN BE AN ALUMINUM OR BRASS PLATE 10" X 10" X 1/8" WITH A CENTERED RECTANGULAR OPENING FOR MOUNTING THE UNIT.



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	R.M. Donohue DMS	13 MAY 65
CHECKED	N. ADRIAN / R.M. Daly	13 MAY 65
APPROVED		
APPROVED	Eldon C Hall	27 May 65
APPROVED MIT	W Kupfer	
APPROVED MSC		6/4/65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006316

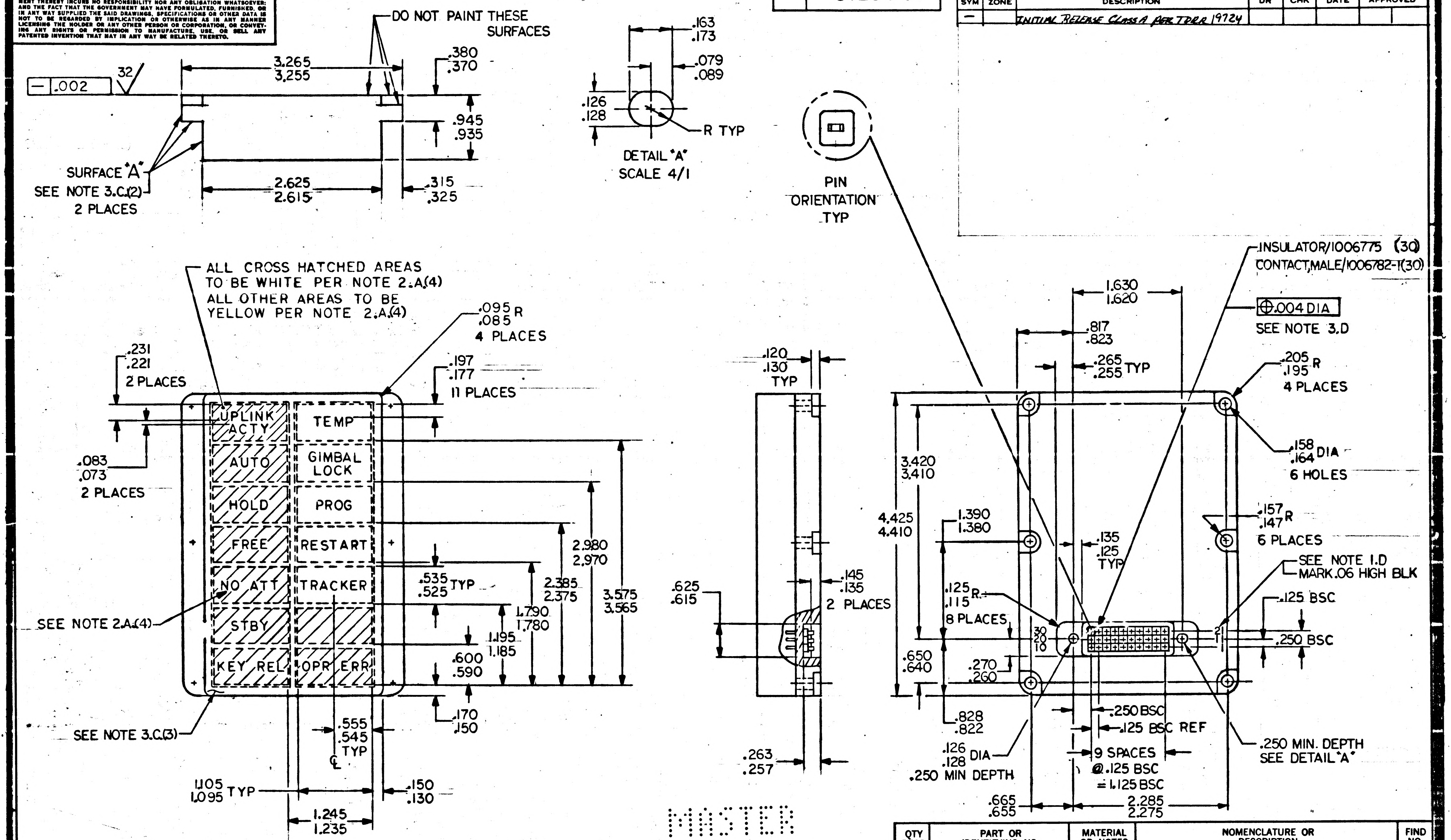
SCALE NONE

SHEET 1 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 19724				



4
3
2
1
DO NOT PAINT THESE SURFACES
3.265
3.255
.380
.370
– .002
32
.945
.935
SURFACE "A"
SEE NOTE 3.C.(2)
2 PLACES
2.625
2.615
.315
.325
.163
.173
.079
.089
.126
.128
R TYP
DETAIL "A"
SCALE 4/1
PIN ORIENTATION TYP
ALL CROSS HATCHED AREAS TO BE WHITE PER NOTE 2.A.(4)
ALL OTHER AREAS TO BE YELLOW PER NOTE 2.A.(4)
.095
.085 R
4 PLACES
.231
.221
2 PLACES
.197
.177
11 PLACES
UPLINK ACTY
TEMP
AUTO
GIMBAL LOCK
HOLD
PROG
FREE
RESTART
NO ATT
TRACKER
STBY
KEY REL
OPR ERR
.083
.073
2 PLACES
.535
.525 TYP
2.980
2.970
2.385
2.375
1.790
1.780
1.195
1.185
3.575
3.565
.600
.590
SEE NOTE 2.A.(4)
SEE NOTE 3.C.(3)
.170
.150
.555
.545
TYP
℄
1.105
1.095 TYP
1.245
1.235
.150
.130
.120
.130
TYP
.625
.615
.145
.135
2 PLACES
.263
.257
INSULATOR/1006775 (30)
CONTACT,MALE/1006782-1(30)
1.630
1.620
⌖ .004 DIA
SEE NOTE 3.D
.817
.823
.265
.255 TYP
.205
.195 R
4 PLACES
.158
.164 DIA
6 HOLES
3.420
3.410
4.425
4.410
1.390
1.380
.157
.147 R
6 PLACES
.135
.125
TYP
SEE NOTE 1.D
MARK .06 HIGH BLK
.125 R
.115
8 PLACES
30
20
10
21
11
1
.125 BSC
.250 BSC
.650
.640
.270
.260
.828
.822
.250 BSC
.125 BSC REF
.126
.128 DIA
.250 MIN DEPTH
9 SPACES
@ .125 BSC
= 1.125 BSC
.250 MIN. DEPTH
SEE DETAIL "A"
.665
.655
2.285
2.275

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. P. Leonard 20 Mar 65
CHECKED
APPROVED
APPROVED Eldon C Hall 27 May 65
APPROVED MIT 2 Jun 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006316

SCALE 1 / 1 SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006317 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 16585	2-17-65	
A	REVISED PER TDRR 25021	1/11/66	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

   E. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), LOT CODE, SERIAL NUMBER AND TERMINAL IDENTIFICATION.

   F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS (MIL-STD-105D, LEVEL I, AQL = 4.0)

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MOUNTING HARDWARE: THE FOLLOWING PARTS AS DELINEATED SHALL ACCOMPANY EACH TRANSISTOR, PACKAGED IN ACCORDANCE WITH ND 1002215, CLASS I, CODE ☐, SEPERATELY.

         NUT, PLAIN, HEXAGON - CODE 7
         INSULATOR, WASHER - CODE 4
         INSULATOR, BUSHING - CODE 4

   B. ELECTRICAL CHARACTERISTICS: THE FOLLOWING PARAMETERS, AS SPECIFIED IN TABLE I, SHALL BE INSPECTED ON 100 PERCENT OF PROCUREMENT.

      (1) BREAKDOWN VOLTAGE: BV_{EBO}, BV_{CBO}, LV_{CEO}

      (2) CUTOFF CURRENT: I_{CBO}

      (3) STATIC FORWARD CURRENT TRANSFER RATIO: h_{FE1}, h_{FE2}, h_{FE3}

      (4) SATURATION VOLTAGE: $V_{CE(SAT)1}$, $V_{BE(SAT)1}$

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING INFORMATION.

      (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

      (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

   A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +200°C.

   B. ABSOLUTE MAXIMUM RATINGS (AT +25° ± 3°C UNLESS OTHERWISE SPECIFIED).

      (1) COLLECTOR-BASE VOLTAGE (V_{CB}): 100 VDC
      (2) COLLECTOR-EMITTER VOLTAGE (V_{CE}): 80 VDC
      (3) EMITTER-BASE VOLTAGE (V_{BE}): 8 VDC
      (4) COLLECTOR CURRENT (I_C): 30 AMPERES DC
      (5) POWER DISSIPATION, TOTAL (P_T): 100 WATTS AT +100°C CASE TEMPERATURE.
      (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{J-C}): 1°C/WATT
      (7) JUNCTION OPERATING TEMPERATURE (T_J): +200°C
      (8) STORAGE TEMPERATURE (T_{STG}): -65°C TO +200°C

   C. CONSTRUCTION:

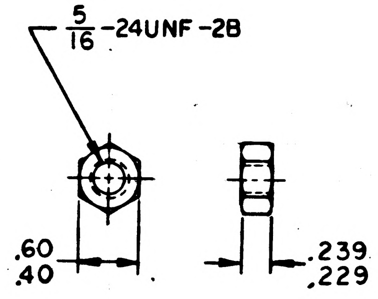
      (1) MATERIAL:

         LEADS: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH ND 1015402 EXCEPT AS FOLLOWS:
         (a) TERMINAL DIMENSIONS AS SPECIFIED ON DRAWING.
         (b) PLATING THICKNESS TO BE 175-225 MICROINCHES NICKEL AND 10-20 MICROINCHES OF GOLD.

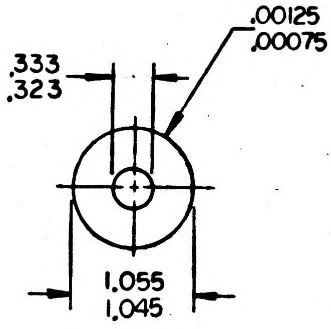
         STUD AND NUT: NICKEL PLATED BRASS.

         INSULATOR, WASHER: 0.00075 + 0.00050 - 0.00000 THICK NATURAL MICA (MUSCOVITE)

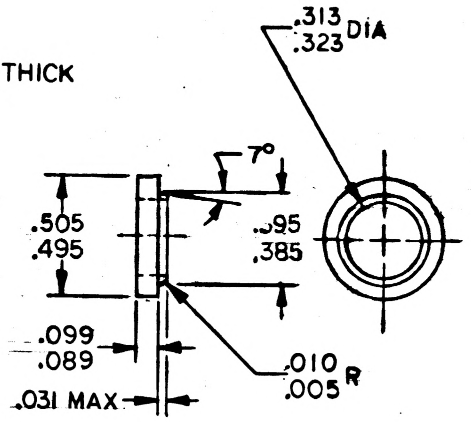
         INSULATOR, BUSHING: ALUMINA (96% Al_2O_3)



HEX NUT



MICA WASHER



BUSHING

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN E. C. Spinelli DATE 23 Nov 64
CHECKED R. T. Duranske 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 11 Feb 65
NASA APPROVAL 2/10/65
MIT APPROVAL 17 Feb 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, NPN, SILICON, POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006317
SCALE NONE	WT	SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006317 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 16585	2-17-65	
A	REVISED PER TDRR 25021	1/11/66	WR

TABLE I

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)

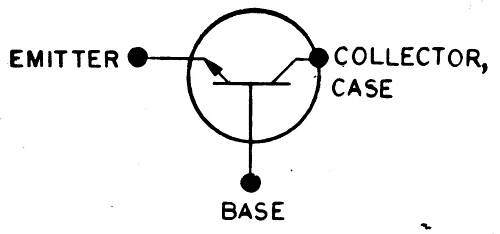
PART NO. 1006317-000 PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMIT		
			MIN	MAX	UNIT
BREAKDOWN VOLTAGE, COLLECTOR-BASE	I_C=200UA, I_E=0	BV_{CBO}	100	-	V_{DC}
BREAKDOWN VOLTAGE, EMITTER-BASE	I_E=200UA, I_C=0	BV_{EBO}	8	-	V_{DC}
BREAKDOWN VOLTAGE, COLLECTOR-EMITTER	I_C=10MA, I_B=0	BV_{CEO}	80	-	V_{DC}
SUSTAINING VOLTAGE, COLLECTOR-EMITTER	I_C=100MA, I_B=0 1	LV_{CEO}	70	-	V_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CB}=60V, I_E=0	I_{CBO}	-	10	uADC
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=10MA	hFE_1	100	-	-
	V_{CE}=5V, I_C=10A 1	hFE_2	100	-	-
	V_{CE}=5V, I_C=20A 1	hFE_3	10	-	-
SATURATION VOLTAGE, COLLECTOR-EMITTER	I_C=10A, I_B= 1A 1	$V_{CE}(sat)$1	-	0.5	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=10A, I_B=1A 1	$V_{BE}(sat)$1	-	1.2	V_{DC}
GAIN BANDWITH PRODUCT	V_{CE}=10V, I_C=1A	-	25	-	MC

PART NO. - 1006317-001 SHALL MEET THE CHARACTERISTICS OF TABLE 1 EXCEPT FOR STATIC FORWARD CURRENT TRANSFER RATIO WHICH SHALL BE WITHIN THE LIMITS SPECIFIED IN TABLE II

TABLE II

STATIC FORWARD CURRENT TRANSFER RATIO	CONDITION	SYMBOL	SPECIFICATION LIMIT		
			MIN	MAX	UNIT
	VCE = 5V, IC = 100 MA	hFE1	80	240	-
	VCE = 2V, IC = 2AMP	hFE2	80	240	-
	VCE = 3V, IC = 10 AMP	hFE3	30	90	-
	VCE = 3V, IC = 20 AMP	hFE4	10	-	-

1. PULSE CONDITIONS: WIDTH ≤ 300 MICROSECONDS: DUTY CYCLE ≤ 2%.



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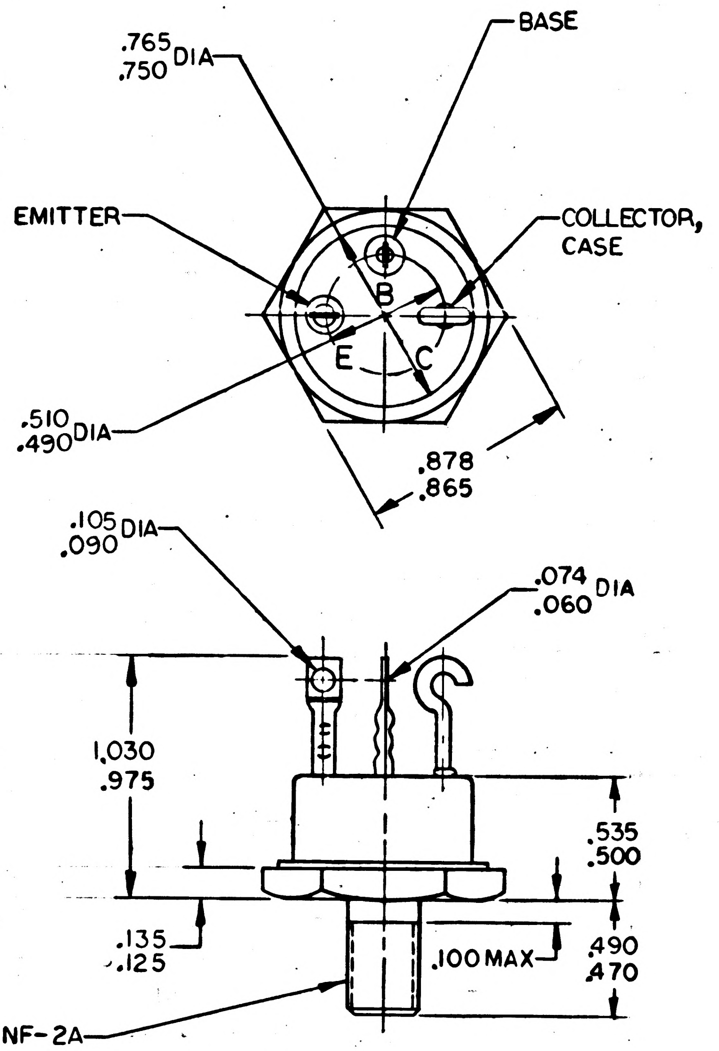

5/16 -24UNF-2A
MAX PITCH DIA OF PLATED THREADS
SHALL BE BASIC PITCH DIA (.2854)
REF (SCREW THREAD STD FOR
FEDERAL SERVICES 1957)
HANDBOOK H28 1957 PART I

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

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APPROVAL
APPROVAL Ellen Hall, by W L R[illegible] E.H. signed first sheet.
NASA APPROVAL [illegible] 2/11/6
MIT APPROVAL
MIT APPROVAL W [illegible] 17 Feb 65

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CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006317
SCALE NONE
WT
SHEET 2 OF 2

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—	1006317

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 16585	2-17-65	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), LOT CODE, SERIAL NUMBER AND TERMINAL IDENTIFICATION.

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS (MIL-STD-105D, LEVEL I, AQL = 4.0)

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) MOUNTING HARDWARE: THE FOLLOWING PARTS AS DELINEATED SHALL ACCOMPANY EACH TRANSISTOR, PACKAGED IN ACCORDANCE WITH ND 1002215, CLASS I, CODE ☐, SEPERATELY.

NUT, PLAIN, HEXAGON - CODE 7
INSULATOR, WASHER - CODE 4
INSULATOR, BUSHING - CODE 4

B. ELECT~~'CAL CHARACTERISTICS: THE FOLLOWING PARAMETERS, AS SPECIFIED IN TABLE I, SHALL BE INSPECTED ON 100 PERCENT OF PROCUREMENT.

(1) BREAKDOWN VOLTAGE: BV_{EBO}, BV_{CBO}, LV_{CEO}

(2) CUTOFF CURRENT: I_{CBO}

(3) STATIC FORWARD CURRENT TRANSFER RATIO: h_{FE1}, h_{FE2}, h_{FE3}.

(4) SATURATION VOLTAGE: $V_{CE(SAT)1}$, $V_{BE(SAT)1}$

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING INFORMATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +200°C.

B. ABSOLUTE MAXIMUM RATINGS (AT +25° ± 3°C UNLESS OTHERWISE SPECIFIED).

(1) COLLECTOR-BASE VOLTAGE (V_{CB}): 100 VDC

(2) COLLECTOR-EMITTER VOLTAGE (V_{CE}): 80 VDC

(3) EMITTER-BASE VOLTAGE (V_{BE}): 8 VDC

(4) COLLECTOR CURRENT (I_C): 30 AMPERES DC

(5) POWER DISSIPATION, TOTAL (P_T): 100 WATTS AT +100°C CASE TEMPERATURE.

(6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{J-C}): 1°C/WATT

(7) JUNCTION OPERATING TEMPERATURE (T_J): +200°C

(8) STORAGE TEMPERATURE (T_{STG}): -65°C TO +200°C

C. CONSTRUCTION:

(1) MATERIAL:

LEADS: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH ND 1015402 EXCEPT AS FOLLOWS:

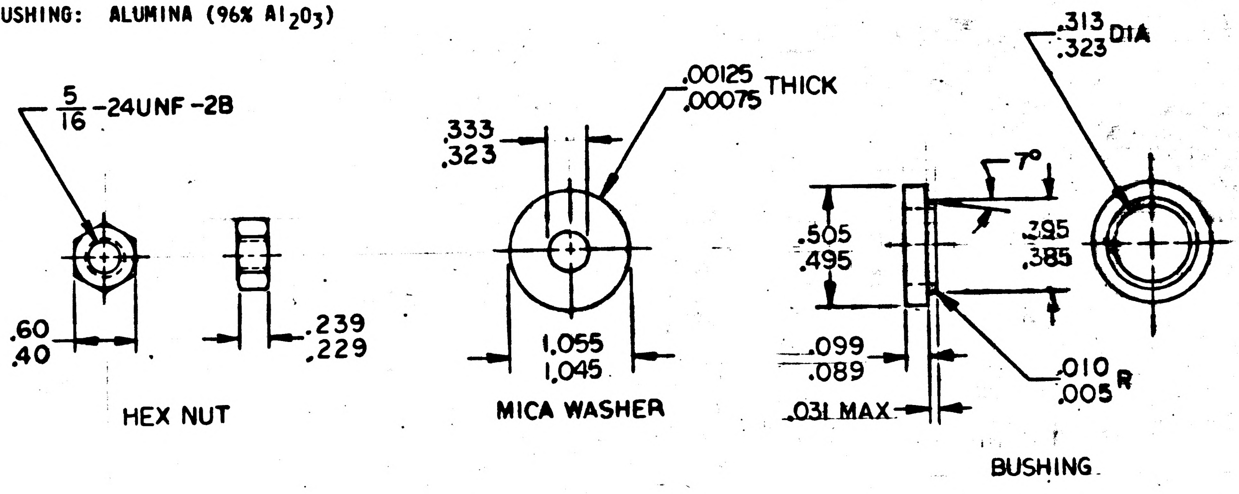
(a) TERMINAL DIMENSIONS AS SPECIFIED ON DRAWING.

(b) PLATING THICKNESS TO BE 175-225 MICROINCHES NICKEL AND 10-20 MICROINCHES OF GOLD.

STUD AND NUT: NICKEL PLATED BRASS.

INSULATOR, WASHER: 0.00075 + 0.00050 - 0.00000 THICK NATURAL MICA (MUSCOVITE)

INSULATOR, BUSHING: ALUMINA (96% Al_2O_3)



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS

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APPROVAL Ellen C Hall 11 Feb 65
NASA APPROVAL [illegible] 2/10/65
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4 3 2 1

1006317

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 16585	2-17-65	

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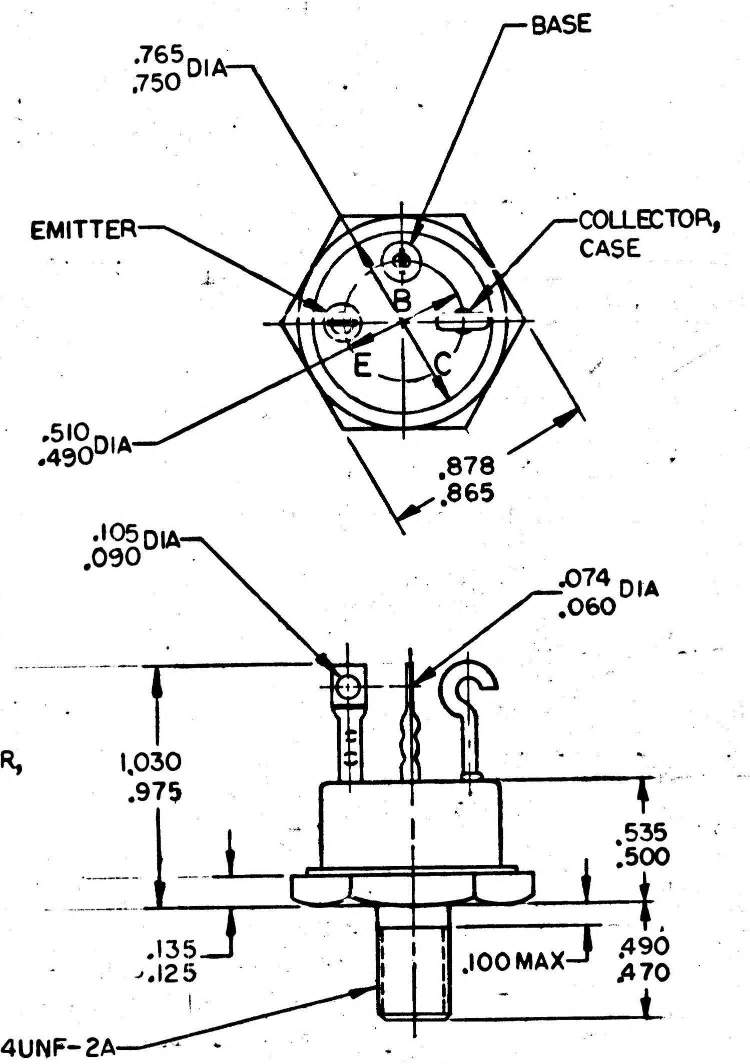
TABLE I

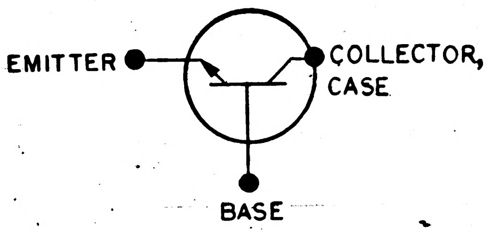
ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMIT MIN	MAX	UNIT
BREAKDOWN VOLTAGE, COLLECTOR-BASE	I_C=200UA, I_E=0	BV_{CBO}	100	-	V_{DC}
BREAKDOWN VOLTAGE, EMITTER-BASE	I_E=200UA, I_C=0	BV_{EBO}	8	-	V_{DC}
BREAKDOWN VOLTAGE, COLLECTOR-EMITTER	I_C=10MA, I_B=0	BV_{CEO}	80	-	V_{DC}
SUSTAINING VOLTAGE, COLLECTOR-EMITTER	I_C=100MA, I_B=0 1	LV_{CEO}	70	-	V_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CB}=60V, I_E=0	I_{CBO}	-	10	uADC
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=10MA	hFE_1	100	-	-
	V_{CE}=5V, I_C=10A 1	hFE_2	100	-	-
	V_{CE}=5V, I_C=20A 1	hFE_3	10	-	-
SATURATION VOLTAGE, COLLECTOR-EMITTER	I_C=10A, I_B= 1A 1	V_{CE}(sat)1	-	0.5	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=10A, I_B=1A 1	V_{BE}(sat)1	-	1.2	V_{DC}
GAIN BANDWITH PRODUCT	V_{CE}=10V, I_C=1A	-	25	-	MC

1 PULSE CONDITIONS: WIDTH $\leq$ 300 MICROSECONDS; DUTY CYCLE $\leq$ 2%.



MAX PITCH DIA OF PLATED THREADS SHALL BE BASIC PITCH DIA(.2854) REF(SCREW THREAD STD FOR FEDERAL SERVICES 1957) HANDBOOK H28 1957 PART I



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LIST OF MATERIALS

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HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

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CHECKED R.T. D[illegible] 30 DEC 64
APPROVAL
APPROVAL Ellen Hall, by W.R.Ryan E.H. signed first sheet.
NASA APPROVAL [illegible] 2/17/65
MIT APPROVAL
MIT APPROVAL W[illegible] 17 Feb 65

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4 3 2 1

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— 1006318

REVISIONS 15621			
SYM	DESCRIPTION	DATE	APPROVAL
	INITIAL RELEASE CLASS A PER TDRR 15621	1/19/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. ADHESIVE COVERED BY THIS DRAWING SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF MIL-P-19834A WHEN USED IN CONJUNCTION WITH A SUITABLE NAMEPLATE SUBSTITUTE.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. ROLL MARKING: THE INSIDE DIAMETER OR EDGE OF EACH ROLL BOBBIN SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I.

(1) SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH PARAGRAPHS 3.5.1 & 3.5.2 OF ND 1002215.

(2) ALL PACKAGES SHALL BE MARKED WITH THE DATE OF MANUFACTURE OR CODE AS WELL AS OTHER MARKING.

2. ACCEPTANCE & INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: 1.00 ± 0.03 INCHES WIDE X 60 YARDS LONG.

(2) EDGE ADHESION: SHALL MEET THE REQUIREMENTS OF MIL-P-19834A WHEN APPLIED TO A NAMEPLATE SUBSTITUTE PER THAT SPECIFICATION.

B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF ROLLS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH THE APPLICABLE REQUIREMENTS OF MIL-P-19834A.

3. DESIGN:

A. STORAGE LIFE: 6 MONTHS MINIMUM WHEN STORED AT TEMPERATURES BETWEEN 35°F AND 80°F AND AT RELATIVE HUMIDITIES ABOVE 35%. STORAGE IN UNOPENED ORIGINAL CONTAINERS WILL INCREASE SHELF LIFE.

B. CONSTRUCTION: PRESSURE-SENSITIVE SYNTHETIC ADHESIVE COATED ONTO A SILICONE TREATED PAPER RELEASE (TRANSFER) TAPE. RELEASE TAPE MUST HOLD ADHESIVE WHEN BEING UNROLLED BUT SEPARATE EASILY WHEN ADHESIVE IS APPLIED TO ANOTHER SURFACE.

C. SPACECRAFT CREW COMPARTMENTS: ONLY THOSE MATERIALS, COMPOSITIONS, AND COMPOSITES FOUND TO BE NON-TOXIC AND NONFLAMMABLE WHEN TESTED AS SPECIFIED IN ND 1002251 AND ND 1002252 SHALL BE APPROVED FOR USE IN SPACECRAFT CREW COMPARTMENTS.

D. INTENDED USE: ADHESIVE FILM, IN TAPE FORM, WHICH CAN BE TRANSFERRED TO MOST CLEAN SURFACES TO PROVIDE A PRESSURE-SENSITIVE ADHESIVE MOUNTING SURFACE. SOME POLYETHYLENES MAY BE EXCEPTIONS, IN THAT ADHESION MAY NOT BE PARTICULARLY GOOD.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS

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NASA APPROVAL W J Rhine 1-19-65
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MIT APPROVAL W Cuffe 19 Jan 65

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ADHESIVE, PRESSURE-SENSITIVE
FILM—RELEASE PAPER MOUNTED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006318
SCALE NONE
WT
SHEET 1 OF 1

1006320 A

REVISIONS 15327			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WC

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) SURFACE QUALITY: CORE INSIDE DIAMETER SHALL HAVE A SURFACE ROUGHNESS AS DELINEATED AND THE PART SHALL HAVE NO SHARP EDGES OR BURRS.

(2) SEALING COAT: A SUITABLE UNIFORM, HOMOGENOUS, CONTAMINANT-FREE COATING SHALL BE APPLIED TO EFFECT A SEAL CAPABLE OF WITHSTANDING THE FOLLOWING TEST (-001 ONLY SHALL BE TESTED).

(a) SUBMERGE THE CORES TO A DEPTH OF TWO INCHES MAXIMUM IN A HALF AND HALF GLYCERIN-ETHYLENE GLYCOL MIXTURE.

(b) APPLY A VACUUM, SUCH THAT A MERCURY COLUMN AT SEA LEVEL WILL DROP 25 INCHES, FOR 2 MINUTES MINIMUM.

(c) REJECT ANY UNIT THAT EXHIBITS BUBBLES.

(d) PERFORM A COMPLETE ELECTRICAL TEST ON UNITS AFTER THOROUGHLY WASHING IN RUNNING WATER AND ALLOWING TO DRY.

B. ELECTRICAL CHARACTERISTICS (MEASURED AT ROOM TEMPERATURE PER TEST METHOD BELOW, VALUES OF TABLE I OR II, AND AS DEFINED IN FIGURES 3 AND 4):

(1) TIME TO PEAK (T_P) - MEASURED FROM START OF THE RAMP TO PEAK OF THE OUTPUT VOLTAGE. START OF THE RAMP CAN BE FOUND BY EXTENDING RAMP BACK TO CROSSING OF THE "ZERO CURRENT" AXIS.

(2) SWITCHING TIME (T_S) - MEASURED AT 10% OF NOMINAL V_1 OUTPUT.

(3) PEAK "ONE" OUTPUT (V_1) - MEASURED FROM ZERO TO THE PEAK OF THE OUTPUT WAVEFORM.

(4) PEAK "ZERO" OUTPUT (V_0-V_{JIG}) - MEASURED INSTANTANEOUSLY BETWEEN INDUCED JIG VOLTAGE (V_{JIG}) AND PEAK "ZERO" VOLTAGE.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND CONSTRUCTION REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH SEAL TEST.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -35°C TO +85°C.

B. CONSTRUCTION AND MATERIAL: PARTS SHALL BE A PERMALLOY TYPE RIBBON MATERIAL WOUND ON A BOBBIN, SLEEVED WITH AN INSULATING MATERIAL AND COATED EXTERNALLY WITH AN INSULATING COMPOUND TO EFFECT A HERMETIC SEAL.

(1) BOBBIN: NON-MAGNETIC ANNEALED CORROSION-RESISTING STEEL.

(2) CORE: 1/8 MIL NOMINAL THICKNESS MO-PERM RIBBON (OR EQUIVALENT).

(3) SLEEVE (JACKET): .011 THICK PHENOLIC SLEEVE (OR EQUIVALENT).

(4) CORE SHALL HAVE AN AIR SPACE OF 0.008 FROM THE TOP LAYER OF TAPE TO THE BOBBIN EDGE. COMPLIANCE SHALL BE CERTIFIED.

C. TEST METHOD:

(1) EQUIPMENT:

TEKTRONIX 530-540 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

A TEST UNIT CAPABLE OF SUPPLYING A "SET CURRENT" PULSE SUFFICIENT IN AMPLITUDE & DURATION TO SATURATE THE CORE UNDER TEST. THIS PULSE TO BE FOLLOWED BY AN ESSENTIALLY LINEAR CURRENT RAMP WHOSE SLOPE MAY BE MEASURED.

AT LEAST 5 STANDARD CORES TOGETHER WITH CALIBRATION DATA FOR EACH, SUPPLIED BY THE PROCURING AGENCY, TO BE USED FOR INSTRUMENT CALIBRATION

(2) CALIBRATION AND MEASUREMENT PROCEDURE:

EQUIPMENT SHALL BE CONNECTED TO A WELL REGULATED SUPPLY LINE AND ALLOWED TO STABILIZE FOR ONE HOUR PRIOR TO MEASUREMENT.

CALIBRATE SCOPE SWEEP WITH TIME-MARK GENERATOR.

USING THE CORE ANALYZER PLUG-IN, CALIBRATE THE VERTICAL SCOPE AMPLIFIER WITH A KNOWN VOLTAGE ± 1%. THE INTERNAL SCOPE CALIBRATOR MAY BE USED IF ITS ACCURACY HAS BEEN VERIFIED.

ADJUST THE "SET" PULSE SO THAT AMPLITUDE AND DURATION ARE AT LEAST 0.5 AMPERES AND 10 MICROSECONDS RESPECTIVELY.

ADJUST RAMP TO APPROXIMATELY 200, 400, OR 1000 MILLIAMPERES/MICROSECOND.

USING ONE OF THE STANDARD CORES, ADJUST THE RAMP SLOPE FOR EITHER 200, 400, OR 1000 MA/USEC AS APPROPRIATE TO YIELD THE T_P, T_S, AND V_1 VALUES SUPPLIED WITH THE STANDARD.

NOTE: WHEN CALIBRATING OR MEASURING FOR 1000 MA/USEC RAMP, DISCONNECT "SET" PULSE AND USE THE INTEGRATING CIRCUIT OF FIGURE 2.

MEASURE ELECTRICAL PARAMETERS FOR CORES UNDER TEST, IN ACCORDANCE WITH TABLES I AND II, FOR EITHER 200, 400, OR 1000 MA/USEC.

REPEAT THE CALIBRATION PROCEDURE AT LEAST EVERY HALF HOUR WHILE TESTING.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS			

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HEAT TREATMENT: NONE
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APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J Rhine 1-6-65
MIT APPROVAL W Kupfer 6 Jan 65
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CORE, MAGNETIC

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(2) | A | 1006320

REVISIONS 15327

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16355	2/17/65	WK

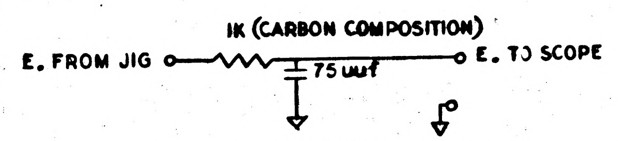

FIG 2. INTERGRATING CIRCUIT

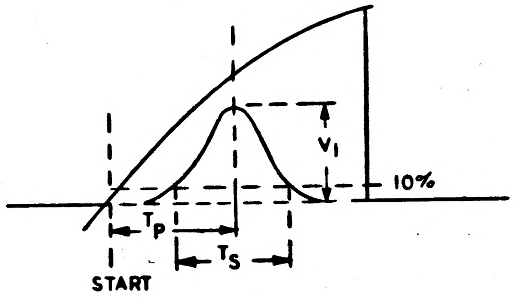

FIGURE 4

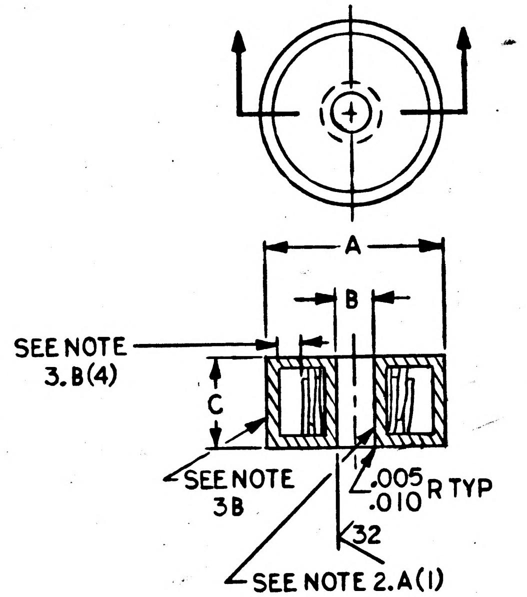

FIGURE I

TABLE III				
DASH NUMBER	DIM A	DIM B	DIM C	CHARACTERISTICS
-001	.249 .240	.140 MIN	.105 .090	TABLE I
-002	.187 .174	.100 MIN	.065 MAX	TABLE II

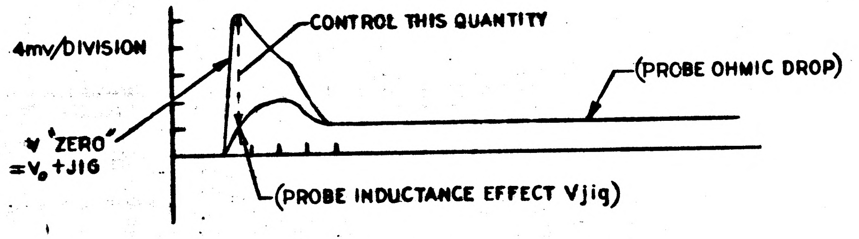

FIG 3
TYPICAL OUTPUT VOLTAGES AFTER INTEGRATION

TABLE I

26 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.375 MIN 2.625 MAX	1.5 MIN 2.1 MAX	215 MIN 290 MAX	240 MV	—
400 MA / USEC	1.4 MIN 1.6 MAX	1.3 MIN 1.5 MAX	325 MIN 430 MAX	360 MV	—
1000 MA / USEC	—	—	—	—	15 MAX

TABLE II

11 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.09 MIN 2.31 MAX	1.5 MIN 2.1 MAX	100 MIN 130 MAX	110 MV	—
400 MA / USEC	1.24 MIN 1.37 MAX	1.0 MIN 1.4 MAX	145 MIN 190 MAX	150 MV	—
1000 MA / USEC	—	—	—	—	9 MAX

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN P. Winfield DATE 30DEC64
CHECKED R.T. Trousinko 30DEC64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J Rhine 1-6-65
MIT APPROVAL W Crapper 6 Jan 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006320
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 15327

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WC
B	REVISED PER TDRR 19194	6/4/65	WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) SURFACE QUALITY: CORE INSIDE DIAMETER SHALL HAVE A SURFACE ROUGHNESS AS DELINEATED AND THE PART SHALL HAVE NO SHARP EDGES OR BURRS.

(2) SEALING COAT: A SUITABLE UNIFORM, HOMOGENOUS, CONTAMINANT-FREE COATING SHALL BE APPLIED TO EFFECT A SEAL CAPABLE OF WITHSTANDING THE FOLLOWING TEST (-001 ONLY SHALL BE TESTED).

(a) SUBMERGE THE CORES TO A DEPTH OF TWO INCHES MAXIMUM IN A HALF AND HALF GLYCERIN-ETHYLENE GLYCOL MIXTURE.

(b) APPLY A VACUUM, SUCH THAT A MERCURY COLUMN AT SEA LEVEL WILL DROP 25 INCHES, FOR 2 MINUTES MINIMUM.

(c) REJECT ANY UNIT THAT EXHIBITS BUBBLES.

(d) PERFORM A COMPLETE ELECTRICAL TEST ON UNITS AFTER THOROUGHLY WASHING IN RUNNING WATER AND ALLOWING TO DRY.

B. ELECTRICAL CHARACTERISTICS (MEASURED AT ROOM TEMPERATURE PER TEST METHOD BELOW, VALUES OF TABLE I OR II, AND AS DEFINED IN FIGURES 3 AND 4):

(1) TIME TO PEAK (T_P) - MEASURED FROM START OF THE RAMP TO PEAK OF THE OUTPUT VOLTAGE. START OF THE RAMP CAN BE FOUND BY EXTENDING RAMP BACK TO CROSSING OF THE "ZERO CURRENT" AXIS.

(2) SWITCHING TIME (T_S) - MEASURED AT 10% OF NOMINAL V_1 OUTPUT.

(3) PEAK "ONE" OUTPUT (V_1) - MEASURED FROM ZERO TO THE PEAK OF THE OUTPUT WAVEFORM.

(4) PEAK "ZERO" OUTPUT (V_0-V_{JIG}) - MEASURED INSTANTANEOUSLY BETWEEN INDUCED JIG VOLTAGE (V_{JIG}) AND PEAK "ZERO" VOLTAGE.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND CONSTRUCTION REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH SEAL TEST.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -35°C TO +85°C.

B. CONSTRUCTION AND MATERIAL: PARTS SHALL BE A PERMALLOY TYPE RIBBON MATERIAL WOUND ON A BOBBIN, SLEEVED WITH AN INSULATING MATERIAL AND COATED EXTERNALLY WITH AN INSULATING COMPOUND TO EFFECT A HERMETIC SEAL.

(1) BOBBIN: NON-MAGNETIC ANNEALED CORROSION-RESISTING STEEL.

(2) CORE: 1/8 MIL NOMINAL THICKNESS MO-PERM RIBBON (OR EQUIVALENT).

(3) SLEEVE (JACKET): .011 THICK PHENOLIC SLEEVE (OR EQUIVALENT).

(4) CORE -001 ONLY SHALL HAVE AN AIR SPACE OF 0.008 MINIMUM FROM THE TOP LAYER OF TAPE TO THE BOBBIN EDGE. COMPLIANCE SHALL BE CERTIFIED.

C. TEST METHOD:

(1) EQUIPMENT:

TEKTRONIX 530-540 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

A TEST UNIT CAPABLE OF SUPPLYING A "SET CURRENT" PULSE SUFFICIENT IN AMPLITUDE & DURATION TO SATURATE THE CORE UNDER TEST. THIS PULSE TO BE FOLLOWED BY AN ESSENTIALLY LINEAR CURRENT RAMP WHOSE SLOPE MAY BE MEASURED.

AT LEAST 5 STANDARD CORES TOGETHER WITH CALIBRATION DATA FOR EACH, SUPPLIED BY THE PROCURING AGENCY, TO BE USED FOR INSTRUMENT CALIBRATION

(2) CALIBRATION AND MEASUREMENT PROCEDURE:

EQUIPMENT SHALL BE CONNECTED TO A WELL REGULATED SUPPLY LINE AND ALLOWED TO STABILIZE FOR ONE HOUR PRIOR TO MEASUREMENT.

CALIBRATE SCOPE SWEEP WITH TIME-MARK GENERATOR.

USING THE CORE ANALYZER PLUG-IN, CALIBRATE THE VERTICAL SCOPE AMPLIFIER WITH A KNOWN VOLTAGE ± 1%. THE INTERNAL SCOPE CALIBRATOR MAY BE USED IF ITS ACCURACY HAS BEEN VERIFIED.

ADJUST THE "SET" PULSE SO THAT AMPLITUDE AND DURATION ARE AT LEAST 0.5 AMPERES AND 10 MICROSECONDS RESPECTIVELY.

ADJUST RAMP TO APPROXIMATELY 200, 400, OR 1000 MILLIAMPERES/MICROSECOND.

USING ONE OF THE STANDARD CORES, ADJUST THE RAMP SLOPE FOR EITHER 200, 400, OR 1000 MA/USEC AS APPROPRIATE TO YIELD THE T_P, T_S, AND V_1 VALUES SUPPLIED WITH THE STANDARD.

NOTE: WHEN CALIBRATING OR MEASURING FOR 1000 MA/USEC RAMP, DISCONNECT "SET" PULSE AND USE THE INTEGRATING CIRCUIT OF FIGURE 2.

MEASURE ELECTRICAL PARAMETERS FOR CORES UNDER TEST, IN ACCORDANCE WITH TABLES I AND II, FOR EITHER 200, 400, OR 1000 MA/USEC.

REPEAT THE CALIBRATION PROCEDURE AT LEAST EVERY HALF HOUR WHILE TESTING.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN T. Tope DATE 30 DEC 64
CHECKED R.T. Dromeski 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J Rhine 1-6-65
MIT APPROVAL 6 Jan 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006320
SCALE NONE
WT
SHEET 1 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006320 B ②

REVISIONS 15327

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WK
B	REVISED PER TDRR 19194	6/24/65	WK

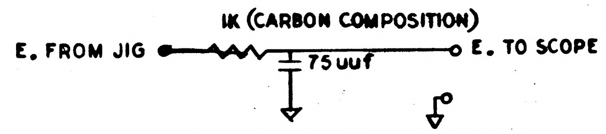

FIG 2. INTERGRATING CIRCUIT

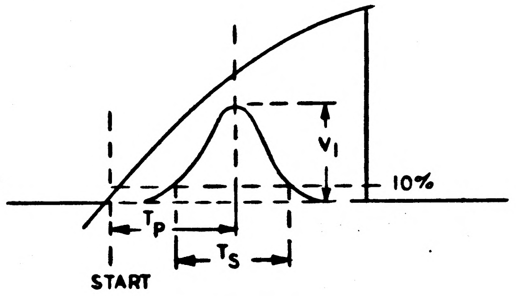

FIGURE 4

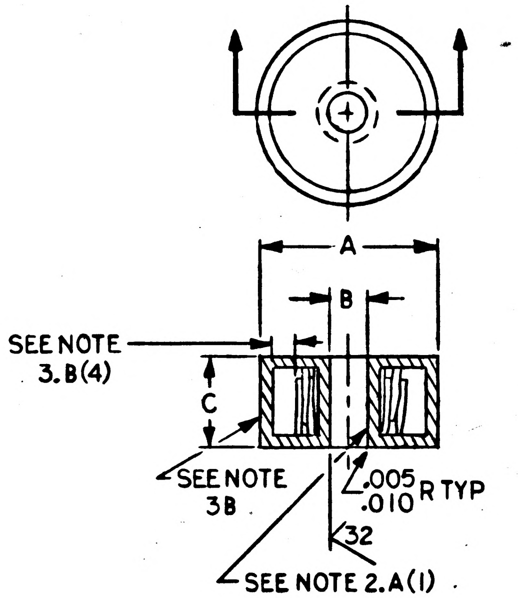

FIGURE 1

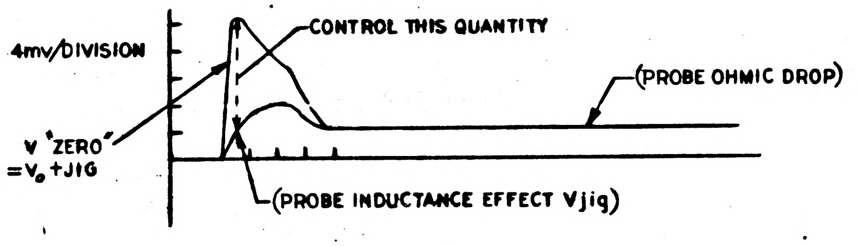

FIG 3
TYPICAL OUTPUT VOLTAGES AFTER INTEGRATION

TABLE III

DASH NUMBER	DIM A MAX	DIM B	DIM C MAX	CHARACTERISTICS
-001	.249	.140 MIN	.105	TABLE I
-002	.187	.100 MIN	.065 MAX	TABLE II

TABLE I

26 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.375 MIN 2.625 MAX	1.5 MIN 2.1 MAX	215 MIN 290 MAX	240 MV	—
400 MA / USEC	1.4 MIN 1.6 MAX	1.3 MIN 1.5 MAX	325 MIN 430 MAX	360 MV	—
1000 MA / USEC	—	—	—	—	15 MAX

TABLE II

11 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.09 MIN 2.31 MAX	1.5 MIN 2.1 MAX	100 MIN 130 MAX	110 MV	—
400 MA / USEC	1.24 MIN 1.37 MAX	1.0 MIN 1.4 MAX	145 MIN 190 MAX	150 MV	—
1000 MA / USEC	—	—	—	—	9 MAX

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT
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CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN P. Winfield DATE 30 DEC 64
CHECKED R.T. Trouville 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J Rhine 1-6-65
MIT APPROVAL W Crafts 6 Jan 65
MIT APPROVAL

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HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006320
SCALE NONE WT SHEET 2 OF 2

MASTER

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1006320 C

REVISIONS 15327			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	wk
B	REVISED PER TDRR 19194	6/24/65	wk
C	REVISED PER TDRR 21869	9/28/65	wk

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) SURFACE QUALITY: CORE INSIDE DIAMETER SHALL HAVE A SURFACE ROUGHNESS AS DELINEATED AND THE PART SHALL HAVE NO SHARP EDGES OR BURRS.

(2) SEALING COAT: A SUITABLE UNIFORM, HOMOGENOUS, CONTAMINANT-FREE COATING SHALL BE APPLIED TO EFFECT A SEAL CAPABLE OF WITHSTANDING THE FOLLOWING TEST (-001 ONLY SHALL BE SEALED AND TESTED)

(a) SUBMERGE THE CORES TO A DEPTH OF TWO INCHES MAXIMUM IN A HALF AND HALF GLYCERIN-ETHYLENE GLYCOL MIXTURE.

(b) APPLY A VACUUM, SUCH THAT A MERCURY COLUMN AT SEA LEVEL WILL DROP 25 INCHES, FOR 2 MINUTES MINIMUM.

(c) REJECT ANY UNIT THAT EXHIBITS BUBBLES.

(d) PERFORM A COMPLETE ELECTRICAL TEST ON UNITS AFTER THOROUGHLY WASHING IN RUNNING WATER AND ALLOWING TO DRY.

(3) ANY LOT WITH GREATER THAN FIVE (5) PERCENT REJECTION BECAUSE OF THIS TEST SHALL BE RETURNED TO THE VENDOR

B. ELECTRICAL CHARACTERISTICS (MEASURED AT ROOM TEMPERATURE PER TEST METHOD BELOW, VALUES OF TABLE I OR II, AND AS DEFINED IN FIGURES 3 & 4): SET PULSE SHOULD BE 0.9±0.1 AMPERE IN AMPLITUDE AND 4±0.1 MICROSECONDS IN DURATION UNLESS OTHERWISE SPECIFIED BELOW. 100% INSPECTION IS REQUIRED UNLESS OTHERWISE SPECIFIED.

(1) TIME TO PEAK (T_P) - MEASURED FROM START OF THE RAMP TO PEAK OF THE OUTPUT VOLTAGE. START OF THE RAMP CAN BE FOUND BY EXTENDING RAMP BACK TO CROSSING OF THE "ZERO CURRENT" AXIS.

(2) SWITCHING TIME (T_S) - MEASURED AT 10% OF NOMINAL V_1 OUTPUT.

(3) PEAK "ONE" OUTPUT (V_1) - MEASURED FROM ZERO TO THE PEAK OF THE OUTPUT WAVEFORM.

(4) PEAK "ZERO" OUTPUT (V_0-V_{JIG}) - MEASURED INSTANTANEOUSLY BETWEEN INDUCED JIG VOLTAGE (V_{JIG}) AND PEAK "ZERO" VOLTAGE.

(5) DELTA V_1 (ΔV_1): CHANGE IN PEAK "ONE" OUTPUT WHEN SET PULSE AMPLITUDE IS CHANGE FROM 0.9 AMPERE TO 0.33 AMPERE

(6) DELTA T_P (ΔT_P): CHANGE IN TIME TO PEAK WHEN SET PULSE AMPLITUDE IS CHANGED FROM 0.9 AMPERE TO 0.33 AMPERE

(7) A TEN (10) PERCENT SAMPLE OF THE LOT SHOULD BE INSPECTED TO THE REQUIREMENTS OF PARAGRAPH 2.B.5 AND 2.B.6 IN THE EVENT ANY FAILURE IS DETECTED THE ENTIRE LOT SHOULD BE INSPECTED.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING:

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND CONSTRUCTION REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH SEAL TEST.

(4) EACH SHIPMENT OF CORES SHALL CONTAIN TEN (10) CORES WHICH HAVE BEEN TAGGED WITH THE NUMERICAL ELECTRICAL VALUES. THESE SAME CORES SHALL THEN BE TESTED BY THE PROCURING ACTIVITY NOTING THEIR NUMERICAL RESULTS. THE TAGS SHOULD THEN BE RETURNED TO THE VENDOR WITHIN TEN (10) DAYS FROM RECEIPT OF OF SHIPMENT.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -35°C TO +85°C.

B. CONSTRUCTION AND MATERIAL: PARTS SHALL BE A PERMALLOY TYPE RIBBON MATERIAL WOUND ON A BOBBIN, SLEEVED WITH AN INSULATING MATERIAL AND COATED EXTERNALLY WITH AN INSULATING COMPOUND TO EFFECT A HERMETIC SEAL.

(1) BOBBIN: NON-MAGNETIC ANNEALED CORROSION-RESISTING STEEL.

(2) CORE: 1/8 MIL NOMINAL THICKNESS MO-PERM RIBBON (OR EQUIVALENT).

(3) SLEEVE (JACKET): .011 THICK PHENOLIC SLEEVE (OR EQUIVALENT).

(4) CORE -001 ONLY SHALL HAVE AN AIR SPACE OF 0.008 MINIMUM FROM THE TOP LAYER OF TAPE TO THE BOBBIN EDGE. COMPLIANCE SHALL BE CERTIFIED.

C. TEST METHOD:

(1) EQUIPMENT:

TEKTRONIX 530-540 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

A TEST UNIT CAPABLE OF SUPPLYING A "SET CURRENT" PULSE SUFFICIENT IN AMPLITUDE & DURATION TO PERFORM ALL TESTS CALLED OUT ABOVE. THIS PULSE TO BE FOLLOWED BY AN ESSENTIALLY LINEAR CURRENT RAMP WHOSE SLOPE MAY BE MEASURED.

AT LEAST 5 STANDARD CORES TOGETHER WITH CALIBRATION DATA FOR EACH, SUPPLIED BY THE PROCURING AGENCY, TO BE USED FOR INSTRUMENT CALIBRATION

(2) CALIBRATION AND MEASUREMENT PROCEDURE:

EQUIPMENT SHALL BE CONNECTED TO A WELL REGULATED SUPPLY LINE AND ALLOWED TO STABILIZE FOR ONE HOUR PRIOR TO MEASUREMENT.

CALIBRATE SCOPE SWEEP WITH TIME-MARK GENERATOR.

USING THE CORE ANALYZER PLUG-IN, CALIBRATE THE VERTICAL SCOPE AMPLIFIER WITH A KNOWN VOLTAGE ± 1%. THE INTERNAL SCOPE CALIBRATOR MAY BE USED IF ITS ACCURACY HAS BEEN VERIFIED.

ADJUST THE "SET" PULSE SO THAT AMPLITUDE AND DURATION ARE 0.9±0.1 ~~AMPERES & 4~~ ± 0.2 MICROSECONDS RESPECTIVELY.

ADJUST RAMP TO APPROXIMATELY 200, 400, OR 1000 MILLIAMPERES/MICROSECOND.

USING ONE OF THE STANDARD CORES, ADJUST THE RAMP SLOPE FOR EITHER 200, 400, OR 1000 MA/USEC AS APPROPRIATE TO YIELD THE T_P, T_S, AND V_1 VALUES SUPPLIED WITH THE STANDARD.

NOTE: WHEN CALIBRATING OR MEASURING FOR 1000 MA/USEC RAMP, DISCONNECT "SET" PULSE AND USE THE INTEGRATING CIRCUIT OF FIGURE 2.

MEASURE ELECTRICAL PARAMETERS FOR CORES UNDER TEST, IN ACCORDANCE WITH TABLES I AND II, FOR EITHER 200, 400, OR 1000 MA/USEC.

REPEAT THE CALIBRATION PROCEDURE AT LEAST EVERY HALF HOUR WHILE TESTING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN T. Tope DATE 30 Dec 64
CHECKED R.T. [illegible] 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J R[illegible] 1-6-65
MIT APPROVAL W[illegible] 6 Jan 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006320
SCALE NONE	WT	SHEET 1 OF 2

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1006320 C (2)

REVISIONS 15327			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WK
B	REVISED PER TDRR 19194	6/24/65	WK
C	REVISED PER TDRR 21869	9/28/65	WK.

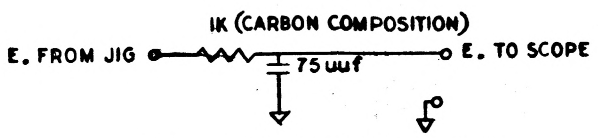

FIG 2. INTERGRATING CIRCUIT

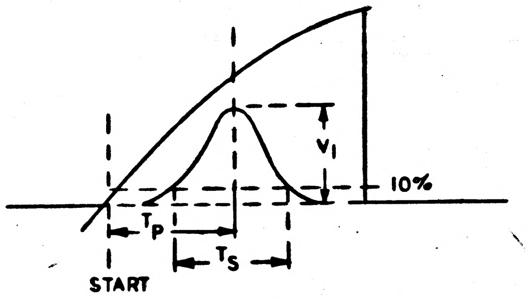

FIGURE 4

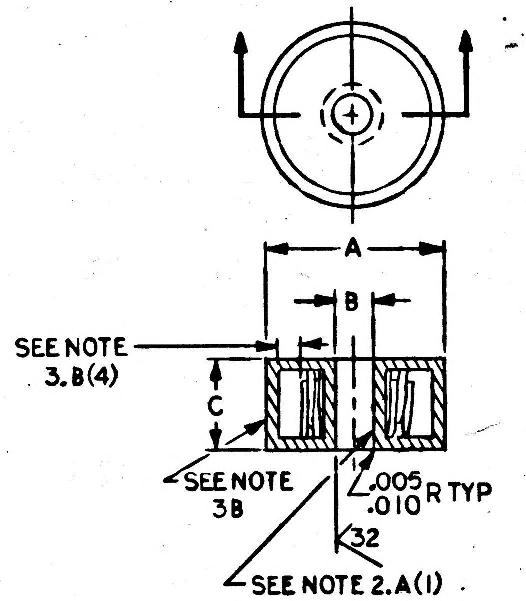

FIGURE I

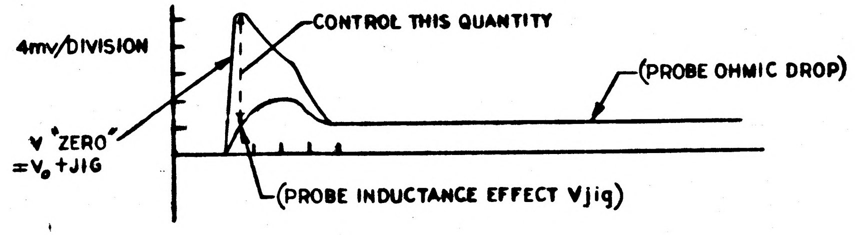

FIG 3
TYPICAL OUTPUT VOLTAGES AFTER INTEGRATION

TABLE III				
DASH NUMBER	DIM A MAX	DIM B	DIM C MAX	CHARACTERISTICS
-001	.249	.140 MIN	.105	TABLE I
-002	.187	.100 MIN	.065 MAX	TABLE II

TABLE I
26 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV	ΔV_1 MV	ΔT_P
200 MA / USEC	2.375 MIN 2.625 MAX	1.5 MIN 2.3 MAX	215 MIN 290 MAX	240 MV	—	10 MV MAX	.050 uSEC
400 MA / USEC	1.4 MIN 1.6 MAX	1.3 MIN 1.6 MAX	325 MIN 430 MAX	360 MV	—	—	—
1000 MA / USEC	—	—	—	—	15 MAX	—	—

TABLE II
11 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.09 MIN 2.31 MAX	1.5 MIN 2.1 MAX	100 MIN 130 MAX	110 MV	-
400 MA / USEC	1.24 MIN 1.37 MAX	1.0 MIN 1.4 MAX	145 MIN 190 MAX	150 MV	-
1000 MA / USEC	-	-	-	-	9 MAX

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN P. Winfield DATE 30DEC64
CHECKED R.T. Dronsinki 30DEC64
APPROVAL
APPROVAL Eldon C Hall 30Dec64
NASA APPROVAL W J Rhine 1-6-65
MIT APPROVAL W. 6 Jan 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006320
SCALE NONE
WT
SHEET 2 OF 2

1006320 D

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WK
B	REVISED PER TDRR 19194	6/4/65	WK
C	REVISED PER TDRR 21869	6/28/65	WK
D	REVISED PER TDRR 23639	11/9/65	WK

REVISIONS 15327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) SURFACE QUALITY: CORE INSIDE DIAMETER SHALL HAVE A SURFACE ROUGHNESS AS DELINEATED AND THE PART SHALL HAVE NO SHARP EDGES OR BURRS. MAX. DIA. OVER ISOLATED SURFACE IMPERFECTIONS ON-001 CORE .252

(2) SEALING COAT: A SUITABLE UNIFORM, HOMOGENOUS, CONTAMINANT-FREE COATING SHALL BE APPLIED TO EFFECT A SEAL CAPABLE OF WITHSTANDING THE FOLLOWING TEST (-001 ONLY SHALL BE SEALED AND TESTED)

(a) SUBMERGE THE CORES TO A DEPTH OF TWO INCHES MAXIMUM IN A HALF AND HALF GLYCERIN-ETHYLENE GLYCOL MIXTURE.

(b) APPLY A VACUUM, SUCH THAT A MERCURY COLUMN AT SEA LEVEL WILL DROP 25 INCHES, FOR 2 MINUTES MINIMUM.

(c) REJECT ANY UNIT THAT EXHIBITS BUBBLES.

(d) PERFORM A COMPLETE ELECTRICAL TEST ON UNITS AFTER THOROUGHLY WASHING IN RUNNING WATER AND ALLOWING TO DRY.

(3) ANY LOT WITH GREATER THAN FIVE (5) PERCENT REJECTION BECAUSE OF THIS TEST SHALL BE RETURNED TO THE VENDOR.

B. ELECTRICAL CHARACTERISTICS (MEASURED AT ROOM TEMPERATURE PER TEST METHOD BELOW, VALUES OF TABLE I OR II, AND AS DEFINED IN FIGURES 3 & 4): SET PULSE SHOULD BE 0.9±0.1 AMPERE IN AMPLITUDE AND 4±0.1 MICROSECONDS IN DURATION UNLESS OTHERWISE SPECIFIED BELOW, 100% INSPECTION IS REQUIRED UNLESS OTHERWISE SPECIFIED.

(1) TIME TO PEAK (T_P) - MEASURED FROM START OF THE RAMP TO PEAK OF THE OUTPUT VOLTAGE. START OF THE RAMP CAN BE FOUND BY EXTENDING RAMP BACK TO CROSSING OF THE "ZERO CURRENT" AXIS.

(2) SWITCHING TIME (T_S) - MEASURED AT 10% OF NOMINAL V_1 OUTPUT.

(3) PEAK "ONE" OUTPUT (V_1) - MEASURED FROM ZERO TO THE PEAK OF THE OUTPUT WAVEFORM.

(4) PEAK "ZERO" OUTPUT (V_0-V_{JIG}) - MEASURED INSTANTANEOUSLY BETWEEN INDUCED JIG VOLTAGE (V_{JIG}) AND PEAK "ZERO" VOLTAGE.

(5) DELTA V_1 (ΔV_1): CHANGE IN PEAK "ONE" OUTPUT WHEN SET PULSE AMPLITUDE IS CHANGE FROM 0.9 AMPERE TO 0.33 AMPERE.

(6) DELTA T_P (ΔT_P): CHANGE IN TIME TO PEAK WHEN SET PULSE AMPLITUDE IS CHANGED FROM 0.9 AMPERE TO 0.33 AMPERE

(7) A TEN (10) PERCENT SAMPLE OF THE LOT SHOULD BE INSPECTED TO THE REQUIREMENTS OF PARAGRAPH 2.B.5 AND 2.B.6 IN THE EVENT ANY FAILURE IS DETECTED THE ENTIRE LOT SHOULD BE INSPECTED.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING:

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND CONSTRUCTION REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH SEAL TEST.

(4) EACH SHIPMENT OF CORES SHALL CONTAIN TEN (10) CORES WHICH HAVE BEEN TAGGED WITH THE NUMERICAL ELECTRICAL VALUES. THESE SAME CORES SHALL THEN BE TESTED BY THE PROCURING ACTIVITY NOTING THEIR NUMERICAL RESULTS. THE TAGS SHOULD THEN BE RETURNED TO THE VENDOR WITHIN TEN (10) DAYS FROM RECEIPT OF OF SHIPMENT

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -35°C TO +85°C.

B. CONSTRUCTION AND MATERIAL: PARTS SHALL BE A PERMALLOY TYPE RIBBON MATERIAL WOUND ON A BOBBIN, SLEEVED WITH AN INSULATING MATERIAL AND COATED EXTERNALLY WITH AN INSULATING COMPOUND TO EFFECT A HERMETIC SEAL.

(1) BOBBIN: NON-MAGNETIC ANNEALED CORROSION-RESISTING STEEL.

(2) CORE: 1/8 MIL NOMINAL THICKNESS MO-PERM RIBBON (OR EQUIVALENT).

(3) SLEEVE (JACKET): .011 THICK PHENOLIC SLEEVE (OR EQUIVALENT).

(4) CORE -001 ONLY SHALL HAVE AN AIR SPACE OF 0.008 MINIMUM FROM THE TOP LAYER OF TAPE TO THE BOBBIN EDGE. COMPLIANCE SHALL BE CERTIFIED.

C. TEST METHOD:

(1) EQUIPMENT:

TEKTRONIX 530-540 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

A TEST UNIT CAPABLE OF SUPPLYING A "SET CURRENT" PULSE SUFFICIENT IN AMPLITUDE & DURATION TO PERFORM ALL TESTS CALLED OUT ABOVE THIS PULSE TO BE FOLLOWED BY AN ESSENTIALLY LINEAR CURRENT RAMP WHOSE SLOPE MAY BE MEASURED.

AT LEAST 5 STANDARD CORES TOGETHER WITH CALIBRATION DATA FOR EACH, SUPPLIED BY THE PROCURING AGENCY, TO BE USED FOR INSTRUMENT CALIBRATION

(2) CALIBRATION AND MEASUREMENT PROCEDURE:

EQUIPMENT SHALL BE CONNECTED TO A WELL REGULATED SUPPLY LINE AND ALLOWED TO STABILIZE FOR ONE HOUR PRIOR TO MEASUREMENT.

CALIBRATE SCOPE SWEEP WITH TIME-MARK GENERATOR.

USING THE CORE ANALYZER PLUG-IN, CALIBRATE THE VERTICAL SCOPE AMPLIFIER WITH A KNOWN VOLTAGE ± 1%. THE INTERNAL SCOPE CALIBRATOR MAY BE USED IF ITS ACCURACY HAS BEEN VERIFIED.

ADJUST THE "SET" PULSE SO THAT AMPLITUDE AND DURATION ARE 0.9±0.1 ~~AMPERES & 4~~ ± 0.2 MICROSECONDS RESPECTIVELY.

ADJUST RAMP TO APPROXIMATELY 200, 400, OR 1000 MILLIAMPERES/MICROSECOND.

USING ONE OF THE STANDARD CORES, ADJUST THE RAMP SLOPE FOR EITHER 200, 400, OR 1000 MA/USEC AS APPROPRIATE TO YIELD THE T_P, T_S, AND V_1 VALUES SUPPLIED WITH THE STANDARD.

NOTE: WHEN CALIBRATING OR MEASURING FOR 1000 MA/USEC RAMP, DISCONNECT "SET" PULSE AND USE THE INTEGRATING CIRCUIT OF FIGURE 2.

MEASURE ELECTRICAL PARAMETERS FOR CORES UNDER TEST, IN ACCORDANCE WITH TABLES I AND II, FOR EITHER 200, 400, OR 1000 MA/USEC.

REPEAT THE CALIBRATION PROCEDURE AT LEAST EVERY HALF HOUR WHILE TESTING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTES

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN T. Tope DATE 30 DEC 64
CHECKED R. T. [illegible] 30 DEC 64
APPROVAL
APPROVAL Eldon C. Hall 30 Dec 64
NASA APPROVAL 1-6-65
MIT APPROVAL 6 Jan 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006320
SCALE NONE	WT	SHEET 1 OF 2

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1006320 | D ②

REVISIONS 15327

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WK
B	REVISED PER TDRR 19194	6/24/65	WK
② C	REVISED PER TDRR 21869	9/28/65	WK.
D	REVISED PER TDRR 23639	11/9/66	WK

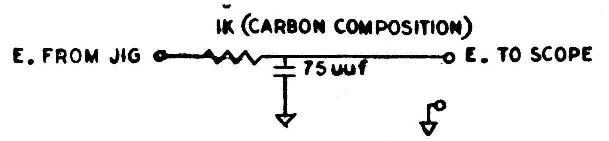

FIG 2. INTERGRATING CIRCUIT

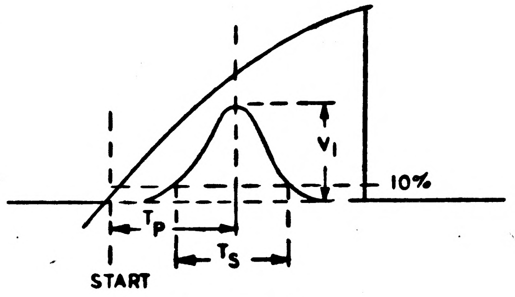

FIGURE 4

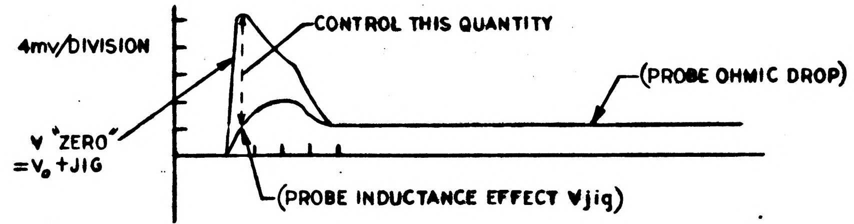

FIG 3
TYPICAL OUTPUT VOLTAGES AFTER INTEGRATION

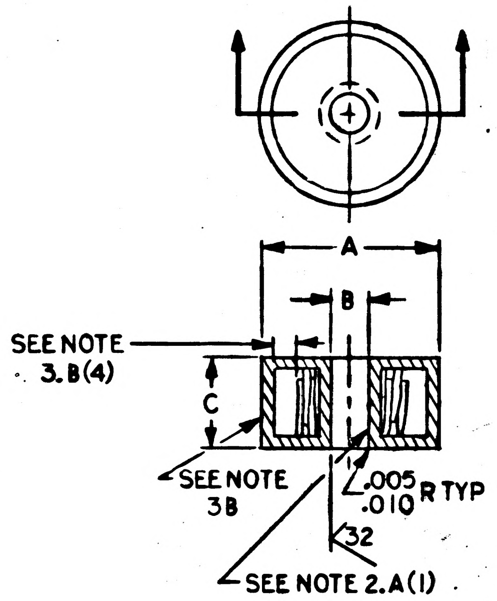

FIGURE 1

TABLE III					
DASH NUMBER	DIM A MAX	DIM B	DIM C MAX	CHARACTERISTICS	REMARKS
-001	.249 NC	.140 MIN	.105	TABLE I	SEE NOTE 2A(1)
-002	.187	.100 MIN	.065 MAX	TABLE II	

TABLE I
26 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV	ΔV_1 MV	ΔT_P
200 MA / USEC	2.375 MIN 2.625 MAX	1.5 MIN 2.3 MAX	215 MIN 290 MAX	240 MV	—	10 MV MAX	.050 uSEC
400 MA / USEC	1.4 MIN 1.6 MAX	1.3 MIN 1.6 MAX	325 MIN 430 MAX	360 MV	—	—	—
1000 MA / USEC	—	—	—	—	15 MAX	—	—

TABLE II
11 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.09 MIN 2.31 MAX	1.5 MIN 2.1 MAX	100 MIN 130 MAX	110 MV	-
400 MA / USEC	1.24 MIN 1.37 MAX	1.0 MIN 1.4 MAX	145 MIN 190 MAX	150 MV	-
1000 MA / USEC	-	-	-	-	9 MAX

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN P. Winfield DATE 30 DEC 64
CHECKED R.T. Desmarais 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J Rhine 1-6-65
MIT APPROVAL W Crayford 6 Jan 65
MIT APPROVAL

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HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006320
SCALE NONE
WT
SHEET 2 OF 2

1006320 E

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REVISIONS 15327			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WR
B	REVISED PER TDRR 19194	7/26/65	WR
C	REVISED PER TDRR 21869	9/28/65	WR
D	REVISED PER TDRR 23639	11/9/65	WR
E	REVISED PER TDRR 26549	2/1/66	WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) SURFACE QUALITY: CORE INSIDE DIAMETER SHALL HAVE A SURFACE ROUGHNESS AS DELINEATED AND THE PART SHALL HAVE NO SHARP EDGES OR BURRS. MAX. DIA. OVER ISOLATED SURFACE IMPERFECTIONS ON-001 CORE .252

(2) SEALING COAT: A SUITABLE UNIFORM, HOMOGENOUS, CONTAMINANT-FREE COATING SHALL BE APPLIED TO EFFECT A SEAL CAPABLE OF WITHSTANDING THE FOLLOWING TEST (-001 ONLY SHALL BE SEALED AND TESTED)

(a) SUBMERGE THE CORES TO A DEPTH OF TWO INCHES MAXIMUM IN A HALF AND HALF GLYCERIN-ETHYLENE GLYCOL MIXTURE.

(b) APPLY A VACUUM, SUCH THAT A MERCURY COLUMN AT SEA LEVEL WILL DROP 25 INCHES, FOR 2 MINUTES MINIMUM.

(c) REJECT ANY UNIT THAT EXHIBITS BUBBLES.

(d) PERFORM A COMPLETE ELECTRICAL TEST ON UNITS AFTER THOROUGHLY WASHING IN RUNNING WATER AND ALLOWING TO DRY.

(3) ANY LOT WITH GREATER THAN FIVE (5) PERCENT REJECTION BECAUSE OF THIS TEST SHALL BE RETURNED TO THE VENDOR AND SHALL NOT BE RESUBMITTED

B. ELECTRICAL CHARACTERISTICS (MEASURED AT ROOM TEMPERATURE PER TEST METHOD BELOW, VALUES OF TABLE I OR II, AND AS DEFINED IN FIGURES 3 & 4): SET PULSE SHOULD BE 0.9±0.1 AMPERE IN AMPLITUDE AND 4±0.1 MICROSECONDS IN DURATION UNLESS OTHERWISE SPECIFIED BELOW. 100% INSPECTION IS REQUIRED UNLESS OTHERWISE SPECIFIED.

(1) TIME TO PEAK (T_P) - MEASURED FROM START OF THE RAMP TO PEAK OF THE OUTPUT VOLTAGE. START OF THE RAMP CAN BE FOUND BY EXTENDING RAMP BACK TO CROSSING OF THE "ZERO CURRENT" AXIS.

(2) SWITCHING TIME (T_S) - MEASURED AT 10% OF NOMINAL V_1 OUTPUT.

(3) PEAK "ONE" OUTPUT (V_1) - MEASURED FROM ZERO TO THE PEAK OF THE OUTPUT WAVEFORM.

(4) PEAK "ZERO" OUTPUT (V_0-V_{JIG}) - MEASURED INSTANTANEOUSLY BETWEEN INDUCED JIG VOLTAGE (V_{JIG}) AND PEAK "ZERO" VOLTAGE.

(5) DELTA V_1 (ΔV_1): CHANGE IN PEAK "ONE" OUTPUT WHEN SET PULSE AMPLITUDE IS CHANGE FROM 0.9 AMPERE TO .40 AMPERE.

(6) DELTA T_P (ΔT_P): CHANGE IN TIME TO PEAK WHEN SET PULSE AMPLITUDE IS CHANGED FROM 0.9 AMPERE TO .40 AMPERE

(7) A TEN (10) PERCENT SAMPLE OF THE LOT SHOULD BE INSPECTED TO THE REQUIREMENTS OF PARAGRAPH 2.B.5 AND 2.B.6 IN THE EVENT ANY FAILURE IS DETECTED THE ENTIRE LOT SHOULD BE INSPECTED.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING:

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND CONSTRUCTION REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH SEAL TEST.

(4) EACH SHIPMENT OF CORES SHALL CONTAIN TEN (10) CORES WHICH HAVE BEEN TAGGED WITH THE NUMERICAL ELECTRICAL VALUES. THESE SAME CORES SHALL THEN BE TESTED BY THE PROCURING ACTIVITY NOTING THEIR NUMERICAL RESULTS. THE TAGS SHOULD THEN BE RETURNED TO THE VENDOR WITHIN TEN (10) DAYS FROM RECEIPT OF OF SHIPMENT

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -35°C TO +85°C.

B. CONSTRUCTION AND MATERIAL: PARTS SHALL BE A PERMALLOY TYPE RIBBON MATERIAL WOUND ON A BOBBIN, SLEEVED WITH AN INSULATING MATERIAL AND COATED EXTERNALLY WITH AN INSULATING COMPOUND TO EFFECT A HERMETIC SEAL.

(1) BOBBIN: NON-MAGNETIC ANNEALED CORROSION-RESISTING STEEL.

(2) CORE: 1/8 MIL NOMINAL THICKNESS MO-PERM RIBBON (OR EQUIVALENT).

(3) SLEEVE (JACKET): .011 THICK PHENOLIC SLEEVE (OR EQUIVALENT).

(4) CORE -001 ONLY SHALL HAVE AN AIR SPACE OF 0.008 MINIMUM FROM THE TOP LAYER OF TAPE TO THE BOBBIN EDGE. COMPLIANCE SHALL BE CERTIFIED.

C. TEST METHOD:

(1) EQUIPMENT:

TEKTRONIX 530-540 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

A TEST UNIT CAPABLE OF SUPPLYING A "SET CURRENT" PULSE SUFFICIENT IN AMPLITUDE & DURATION TO PERFORM ALL TESTS CALLED OUT ABOVE THIS PULSE TO BE FOLLOWED BY AN ESSENTIALLY LINEAR CURRENT RAMP WHOSE SLOPE MAY BE MEASURED.

AT LEAST 5 STANDARD CORES TOGETHER WITH CALIBRATION DATA FOR EACH, SUPPLIED BY THE PROCURING AGENCY, TO BE USED FOR INSTRUMENT CALIBRATION

(2) CALIBRATION AND MEASUREMENT PROCEDURE:

EQUIPMENT SHALL BE CONNECTED TO A WELL REGULATED SUPPLY LINE AND ALLOWED TO STABILIZE FOR ONE HOUR PRIOR TO MEASUREMENT.

CALIBRATE SCOPE SWEEP WITH TIME-MARK GENERATOR.

USING THE CORE ANALYZER PLUG-IN, CALIBRATE THE VERTICAL SCOPE AMPLIFIER WITH A KNOWN VOLTAGE ± 1%. THE INTERNAL SCOPE CALIBRATOR MAY BE USED IF ITS ACCURACY HAS BEEN VERIFIED.

ADJUST THE "SET" PULSE SO THAT AMPLITUDE AND DURATION ARE 0.9±0.1 ~~AMPERES & 4±0.2~~ [illegible] 10 MICROSECONDS RESPECTIVELY.

ADJUST RAMP TO APPROXIMATELY 200, 400, OR 1000 MILLIAMPERES/MICROSECOND.

USING ONE OF THE STANDARD CORES, ADJUST THE RAMP SLOPE FOR EITHER 200, 400, OR 1000 MA/USEC AS APPROPRIATE TO YIELD THE T_P, T_S, AND V_1 VALUES SUPPLIED WITH THE STANDARD.

NOTE: WHEN CALIBRATING OR MEASURING FOR 1000 MA/USEC RAMP, DISCONNECT "SET" PULSE AND USE THE INTEGRATING CIRCUIT OF FIGURE 2.

MEASURE ELECTRICAL PARAMETERS FOR CORES UNDER TEST, IN ACCORDANCE WITH TABLES I AND II, FOR EITHER 200, 400, OR 1000 MA/USEC.

REPEAT THE CALIBRATION PROCEDURE AT LEAST EVERY HALF HOUR WHILE TESTING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN T. Tope DATE 30 Dec 64
CHECKED R.T. [illegible] 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL [illegible] 1-6-65
MIT APPROVAL [illegible] 1/4/65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006320

SCALE NONE WT SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006320 E ②

REVISIONS 1532,7

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WK
B	REVISED PER TDRR 19194	6/24/65	WK
② C	REVISED PER TDRR 21869	9/28/65	WK.
Ⓜ D	REVISED PER TDRR 23639	11/9/65	WK
E	REVISED PER TDRR 26549	3/1/66	WK

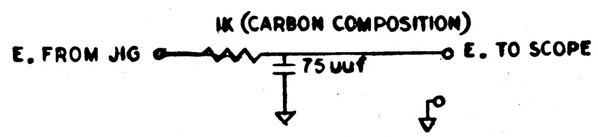

FIG 2. INTERGRATING CIRCUIT

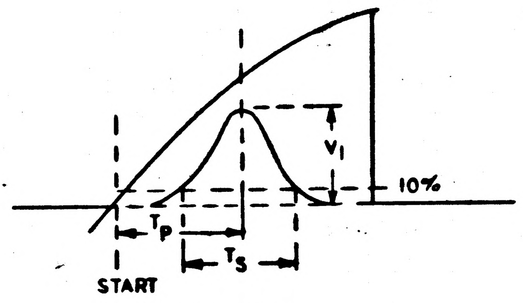

FIGURE 4

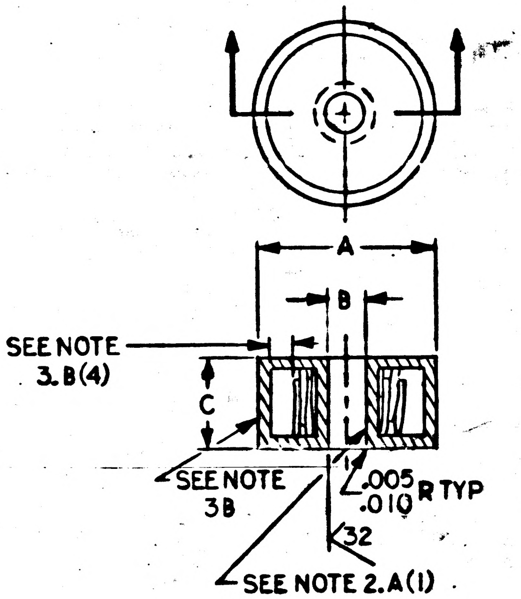

FIGURE 1

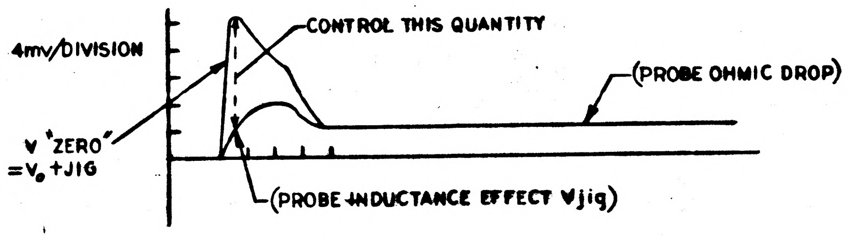

FIG 3
TYPICAL OUTPUT VOLTAGES AFTER INTEGRATION

TABLE III

DASH NUMBER	DIM A MAX	DIM B	DIM C MAX	CHARACTERISTICS	REMARKS
-001	.249 NC	.140 MIN	.105	TABLE I	SEE NOTE 2A(1)
-002	.187	.100 MIN	.075 MAX	TABLE II	

TABLE I
26 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV	ΔV_1 MV	ΔT_P
200 MA / USEC	2.375 MIN 2.625 MAX	1.5 MIN 2.3 MAX	215 MIN 290 MAX	240 MV	—	10 MV MAX	.10 uSEC
400 MA / USEC	1.4 MIN 1.6 MAX	1.3 MIN 1.6 MAX	325 MIN 430 MAX	360 MV	—	—	—
1000 MA / USEC	—	—	—	—	15 MAX	—	—

TABLE II
11 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.09 MIN 2.31 MAX	1.5 MIN 2.1 MAX	100 MIN 130 MAX	110 MV	-
400 MA / USEC	1.24 MIN 1.37 MAX	1.0 MIN 1.4 MAX	145 MIN 190 MAX	150 MV	-
1000 MA / USEC	-	-	-	-	9 MAX

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTES

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DWG. NO. CONTRACT

DRAWN P. Winfield DATE 30 DEC 64
CHECKED R.T. Dennison 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J Rhine 1-6-65
MIT APPROVAL W Crippen 6 Jan 65
MIT APPROVAL

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CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006320
SCALE NONE
WT
SHEET 2 OF 2

— 1006320

REVISIONS 15327

SYM	DESCRIPTION	DATE	APPROVAL

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REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) SURFACE QUALITY: CORE INSIDE DIAMETER SHALL HAVE A SURFACE ROUGHNESS AS DELINEATED AND THE PART SHALL HAVE NO SHARP EDGES OR BURRS.
     - (2) SEALING COAT: A SUITABLE UNIFORM, HOMOGENOUS, CONTAMINANT-FREE COATING SHALL BE APPLIED TO EFFECT A SEAL CAPABLE OF WITHSTANDING THE FOLLOWING TEST (-001 ONLY SHALL BE TESTED).
       - (a) SUBMERGE THE CORES TO A DEPTH OF TWO INCHES MAXIMUM IN A HALF AND HALF GLYCERIN-ETHYLENE GLYCOL MIXTURE.
       - (b) APPLY A VACUUM, SUCH THAT A MERCURY COLUMN AT SEA LEVEL WILL DROP 25 INCHES, FOR 2 MINUTES MINIMUM.
       - (c) REJECT ANY UNIT THAT EXHIBITS BUBBLES.
       - (d) PERFORM A COMPLETE ELECTRICAL TEST ON UNITS AFTER THOROUGHLY WASHING IN RUNNING WATER AND ALLOWING TO DRY.
   - B. ELECTRICAL CHARACTERISTICS (MEASURED AT ROOM TEMPERATURE PER TEST METHOD BELOW, VALUES OF TABLE I OR II, AND AS DEFINED IN FIGURES 3 AND 4):
     - (1) TIME TO PEAK (T_P) - MEASURED FROM START OF THE RAMP TO PEAK OF THE OUTPUT VOLTAGE. START OF THE RAMP CAN BE FOUND BY EXTENDING RAMP BACK TO CROSSING OF THE "ZERO CURRENT" AXIS.
     - (2) SWITCHING TIME (T_S) - MEASURED AT 10% OF NOMINAL V_1 OUTPUT.
     - (3) PEAK "ONE" OUTPUT (V_1) - MEASURED FROM ZERO TO THE PEAK OF THE OUTPUT WAVEFORM.
     - (4) PEAK "ZERO" OUTPUT (V_0-V_{JIG}) - MEASURED INSTANTANEOUSLY BETWEEN INDUCED JIG VOLTAGE (V_{JIG}) AND PEAK "ZERO" VOLTAGE.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND CONSTRUCTION REQUIREMENTS.
     - (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.
     - (3) CERTIFICATE OF COMPLIANCE WITH SEAL TEST.

3. DESIGN:
   - A. OPERATING TEMPERATURE RANGE: -35°C TO +85°C.
   - B. CONSTRUCTION AND MATERIAL: PARTS SHALL BE A PERMALLOY TYPE RIBBON MATERIAL WOUND ON A BOBBIN, SLEEVED WITH AN INSULATING MATERIAL AND COATED EXTERNALLY WITH AN INSULATING COMPOUND TO EFFECT A HERMETIC SEAL.
     - (1) BOBBIN: NON-MAGNETIC ANNEALED CORROSION-RESISTING STEEL.
     - (2) CORE: 1/8 MIL NOMINAL THICKNESS MO-PERM RIBBON (OR EQUIVALENT).
     - (3) SLEEVE (JACKET): .011 THICK PHENOLIC SLEEVE (OR EQUIVALENT).
     - (4) CORE SHALL HAVE AN AIR SPACE OF 0.008 FROM THE TOP LAYER OF TAPE TO THE BOBBIN EDGE. COMPLIANCE SHALL BE CERTIFIED.
   - C. TEST METHOD:
     - (1) EQUIPMENT:

       TEKTRONIX 530-340 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

       ADAR CORE ANALYZER PLUG-IN (TYPE P1-A OR EQUIVALENT).

       A TEST UNIT CAPABLE OF SUPPLYING A "SET" PULSE SUFFICIENT IN AMPLITUDE AND DURATION TO SATURATE THE CORE UNDER TEST, THIS PULSE TO BE FOLLOWED BY AN ESSENTIALLY LINEAR RAMP WHOSE SLOPE MAY BE MEASURED.

       AT LEAST 5 STANDARD CORES TOGETHER WITH CALIBRATION DATA FOR EACH, SUPPLIED BY THE PROCURING AGENCY, TO BE USED FOR INSTRUMENT CALIBRATION
     - (2) CALIBRATION AND MEASUREMENT PROCEDURE:

       EQUIPMENT SHALL BE CONNECTED TO A WELL REGULATED SUPPLY LINE AND ALLOWED TO STABILIZE FOR ONE HOUR PRIOR TO MEASUREMENT.

       CALIBRATE SCOPE SWEEP WITH TIME-MARK GENERATOR.

       USING THE CORE ANALYZER PLUG-IN, CALIBRATE THE VERTICAL SCOPE AMPLIFIER WITH A KNOWN VOLTAGE ± 1%. THE INTERNAL SCOPE CALIBRATOR MAY BE USED IF ITS ACCURACY HAS BEEN VERIFIED.

       ADJUST THE "SET" PULSE SO THAT AMPLITUDE AND DURATION ARE AT LEAST 0.5 AMPERES AND 10 MICROSECONDS RESPECTIVELY.

       ADJUST RAMP TO APPROXIMATELY 200, 400, OR 1000 MILLIAMPERES/MICROSECOND.

       USING ONE OF THE STANDARD CORES, ADJUST THE RAMP SLOPE FOR EITHER 200, 400, OR 1000 MA/USEC AS APPROPRIATE TO YIELD THE T_P, T_S, AND V_1 VALUES SUPPLIED WITH THE STANDARD.

       NOTE: WHEN CALIBRATING OR MEASURING FOR 1000 MA/USEC RAMP, DISCONNECT "SET" PULSE AND USE THE INTEGRATING CIRCUIT OF FIGURE 2.

       MEASURE ELECTRICAL PARAMETERS FOR CORES UNDER TEST, IN ACCORDANCE WITH TABLES I AND II, FOR EITHER 200, 400, OR 1000 MA/USEC.

       REPEAT THE CALIBRATION PROCEDURE AT LEAST EVERY HALF HOUR WHILE TESTING.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTES

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DWG. NO.
CONTRACT

DRAWN T. Tope DATE 30 DEC 64
CHECKED R.T. Dronsuko 30 DEC 64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64

NASA APPROVAL 1-6-65
MIT APPROVAL 6 Jan 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006320
SCALE NONE
WT
SHEET 1 OF 2

MASTER

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1006320 | -

REVISIONS 15327			
SYM	DESCRIPTION	DATE	APPROVAL

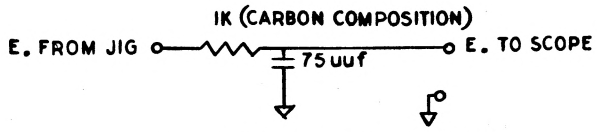

FIG 2. INTERGRATING CIRCUIT

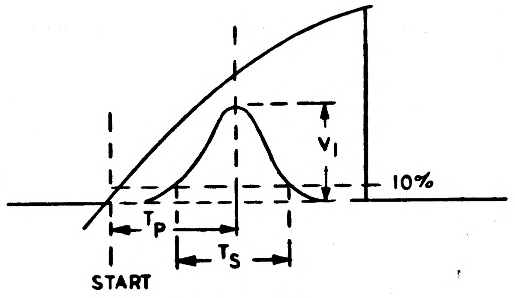

FIGURE 4

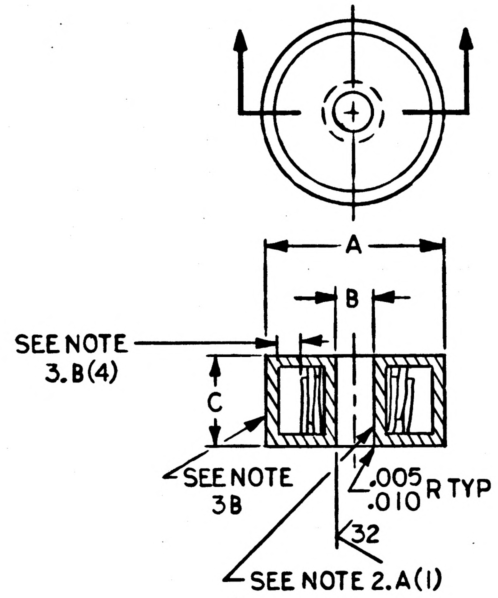

FIGURE I

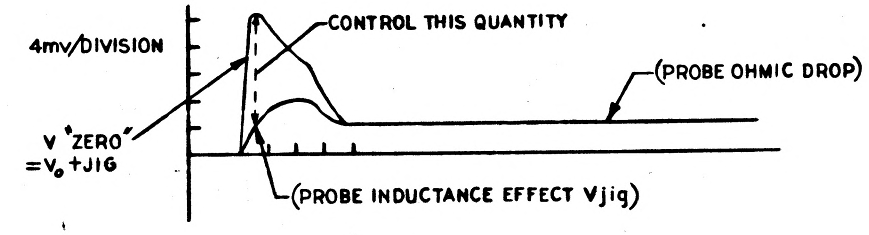

FIG 3
TYPICAL OUTPUT VOLTAGES AFTER INTEGRATION

TABLE III

DASH NUMBER	DIM A	DIM B	DIM C	CHARACTERISTICS
-001	.249 .240	.140 MIN	.105 .090	TABLE I
-002	.187 .174	.100 MIN	.065 MAX	TABLE II

TABLE I
26 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.375 MIN 2.625 MAX	1.5 MIN 2.1 MAX	215 MIN 290 MAX	240 MV	—
400 MA / USEC	1.4 MIN 1.6 MAX	1.3 MIN 1.5 MAX	325 MIN 430 MAX	360 MV	—
1000 MA / USEC	—	—	—	—	15 MAX

TABLE II
11 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	T_P USEC	T_S USEC	V_1 MV	V_1 NOM	V_0 MV
200 MA / USEC	2.09 MIN 2.31 MAX	1.5 MIN 2.1 MAX	100 MIN 130 MAX	110 MV	—
400 MA / USEC	1.24 MIN 1.37 MAX	1.0 MIN 1.4 MAX	145 MIN 190 MAX	150 MV	—
1000 MA / USEC	—	—	—	—	9 MAX

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

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DWG. NO.
CONTRACT
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CHECKED R.T. Dronick 30DEC64
APPROVAL
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL 1-6-65
MIT APPROVAL 6 Jan 65
MIT APPROVAL

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HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006320
SCALE NONE
WT
SHEET 2 OF 2

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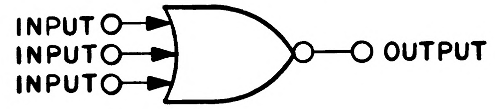
1006321 A

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WK
A	REVISED PER TDRR 17886	4/4/65	WK

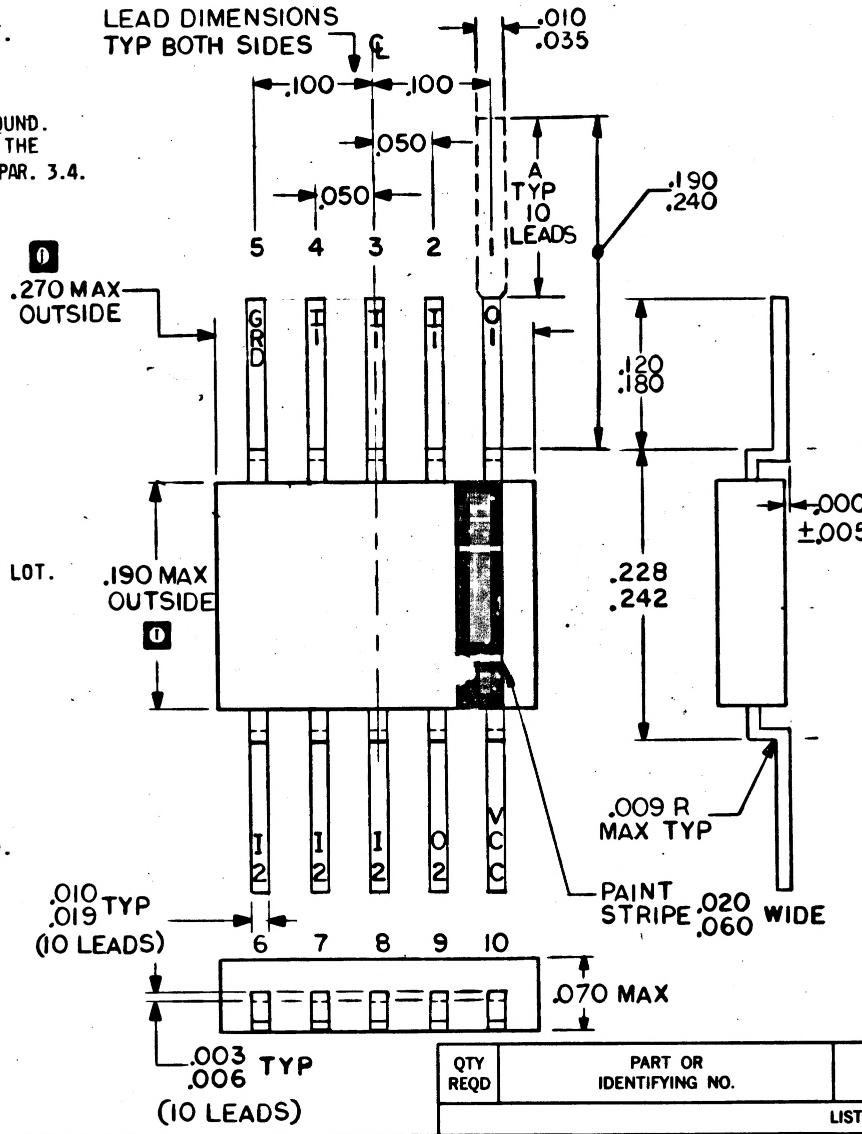
NOTES:

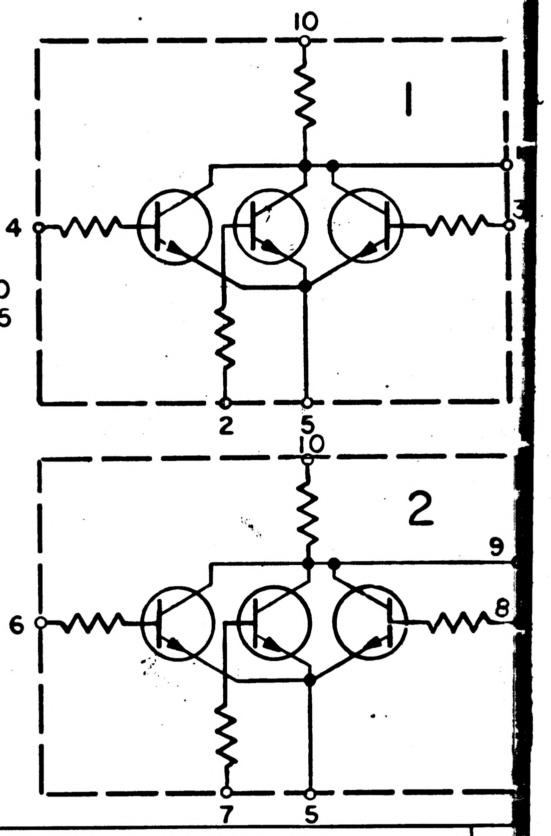
1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) VOLTAGE TO PIN 10: PLUS 10.0 VOLTS WITH RESPECT TO PIN 5
     - (2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO GND PIN
     - (3) THERMAL RESISTANCE, JUNCTION-CASE. (θ_{JC}): 200°C/WATT.
     - (4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (θ_{JA}): 500°C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C
     - (3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX.).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND-1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, KEYING STRIPE AND THE NUMBER 321. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER. NO BODY PAINT.
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON. NPN.
   - B. ENCLOSURE: SEE FIGURE, HERMETICALLY SEALED AND ELECTRICALLY ISOLATED FROM POWER OR GROUND.
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT THAT THE GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES THICK. AND EXCEPT PAR. 3.4. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN. MAXIMUM SHIPPED NUMBER OF UNITS IN ANY LOT SHALL BE 5000 UNITS.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCE TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.
   - C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.
     - (1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE DELETED IN THE SEQUENCE INDICATED.
     - (2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: PURCHASING AGENT
     - (3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.
     - (4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2,3,AND 4 OF TABLE III. IN TABLE III ACCEPTABLE UNITS FROM SUBGROUP 2 MAY BE USED IN SUBGROUP 5.
     - (5) AFTER COMPLETION OF TESTS, UNITS USED ~~IN~~ SUBGROUP 3 OF TABLE III SHALL BE USED IN SUBGROUPS 6 AND 7 OF TABLE III.
     - (6) THE UNITS USED IN THE QUALITY DEMONSTRATION TESTS SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A LOT.
     - (7) A LOT MAY BE RESUBMITTED FOR THE QUALITY DEMONSTRATION TEST ONCE. THE REQUIREMENT OF MIL-S-1900C FOR LOT RESUBMITTAL WILL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.
     - (8) UNITS SHALL BE DATE CODED INDICATING THE WEEK SEALING OPERATION THAT WAS PERFORMED.

LOGIC SYMBOL



Ⓘ ON SPEC BODY DIMENSIONS MAX INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005





QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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DWG. NO.
CONTRACT
DRAWN A. Addario Jr. DATE 23DEC64
CHECKED L. D. Hanley
APPROVAL L. D. Hanley
APPROVAL Ellen C. Hall 24 Dec 64
NASA APPROVAL A. C. Metzger 1/26/65
MIT APPROVAL W Kupfer 26 Jan 65

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DUAL NOR GATE
(FLAT PACK)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006321
SCALE NONE
WT —
SHEET 1 OF 5

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1006321 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR #15729	1/26/65	WK
A	REVISED PER TDRR 17886	4/26/65	WK

NOTES (CONTINUED)

3. D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE: LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A 2 OUNCE WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED. A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 45 DEGREES FROM THE VERTICAL IN ONE DIRECTION, AND BACK 45 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST

(2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 1 POUND MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC. THE UNITS MUST ALSO BE SUBJECTED TO THE GROSS LEAK TEST AS SPECIFIED IN ND1002246. A LEAKAGE RATE OF 5 X 10^{-8} CC/ATM/SEC OR GREATER SHALL CONSTITUTE A FAILURE.

(4) AVERAGE PROPAGATION DELAY (T_P): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 1 MADE UP OF ACCEPTABLE UNITS WHERE $T_P = (T_1 + T_2)/2$. VOLTAGE 4V ± 10%. DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

(5) OPERATION LIFE: AN ODD NUMBER OF UNITS (GATES) SHALL BE CONNECTED IN SERIES WITH THE OUTPUT OF THE LAST UNIT SUPPLYING THE INPUT TO THE FIRST UNIT, THUS FORMING A "RING" AS SHOWN IN FIGURE 2. WITH 8V ± 5% DC APPLIED TO THE POWER TERMINALS OF ALL UNITS IN THE CIRCUIT ("RING") OSCILLATION MUST OCCUR AT THE INITIATION OF THE TEST.

(6) VISUAL AND MECHANICAL EXTERNAL EXAMINATION UNDER 10X AND 80X MAGNIFICATION: MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTERANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION A MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION.

(7) VISUAL INSPECTION: THE VISUAL TEST OF TABLE III SUBGROUP 6 SHALL BE PERFORMED USING THE VISUAL REJECTION CRITERIA OF ND 1002257.

(8) EMITTER-BASE BACK BIAS TEST: ALL BASE INPUTS SHALL HAVE MINUS 4 VOLTS WITH RESPECT TO THE COMMON EMITTER CONNECTION. A BETA TEST SHALL BE PERFORMED BEFORE AND AFTER THE EMITTER-BASE BACK BIAS TEST WITH A MAXIMUM TOLERABLE CHANGE IN BETA OF ± 10%.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404. CLASS 2.

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LIST OF MATERIALS

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SHEET 2 OF 5

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REVISIONS			
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—	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WH
A	REVISED PER TDRR 17886	4/26/65	WH

TABLE II

***	ACCEPTANCE INSPECTION **										
TEST	SYMBOL	TEST CONDITIONS						LIMITS		UNITS	LOT
								MIN	MAX		
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE NOTE 3 D (6)						-	-		*LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2,6	PIN 3,7	PIN 5	PIN 4,8	PIN 1,9	PIN 10				*LPTD = 1.0 MAX. ACC. NO. 2 (COMBINED)
BASE CURRENT	I_B	+870±2mV	+1800±10mV	0V	+1800±10mV		+4±.01V		152	uA	
BASE CURRENT	I_B	+1800±10mV	+870±2mV	0V	+1800±10mV		+4±.01V		152	uA	
BASE CURRENT	I_B	+1800±10mV	+1800±10mV	0V	+870±2mV		+4±.01V		152	uA	
OUTPUT VOLT. PIN 1,9	V_O	+770±2mV	OPEN	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT. PIN 1,9	V_O	OPEN	+770±2mV	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT. PIN 1,9	V_O	OPEN	OPEN	0V	+770±2mV		+4±.01V		300	mV	
SAT. VOLT. PIN 1,9	V_S	+870±2mV	OPEN	0V	OPEN		+4±.01V		220	mV	*LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
SAT. VOLT. PIN 1,9	V_S	OPEN	+870±2mV	0V	OPEN		+4±.01V		220	mV	
SAT. VOLT. PIN 1,9	V_S	OPEN	OPEN	0V	+870±2mV		+4±.01V		220	mV	
OUTPUT CURRENT PIN 1,9	I_O	+500±2mV	+500±2mV	0V	+500±2mV	+870±2mV	+4±.01V	760	15	uA	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	+500±2mV	+500±2MV	0V	+500±2mV	+1.00±.01V	OPEN			uA	
COLLECT. CUTOFF CURRENT	I_{CEO}	OPEN	OPEN	0V	OPEN	+5±.1V	OPEN		100	uA	
EMITTER CUTOFF CURRENT	I_{EBO}	0V	0V	+4±.1V	0V	OPEN	OPEN		100	uA	
COLLECT. CUTOFF CURRENT	I_{CBO}	0V	0V	OPEN	0V	+8±.1V	OPEN		100	uA	
INTERFACE TEST	B_1	870±2mV	OPEN	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_2	OPEN	870±2mV	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_3	OPEN	OPEN	0V	870±2mV	5KΩ TO +10V	OPEN		400	mV	
COLLECTOR EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST.	I_C = 5mA (PULSED) PINS 1,9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_P	SEE NOTE 3D (4) AND FIGURE 1							24	nsec	*LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 10 AND 1,9 MEASUREMENT CURRENT = 1mA						2.7	4.15	Kohms	*LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		*LTPD = 7 MAX. ACC. NO. = 1

* LTPD PER MIL-S-19500C, TABLE IV

** SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV

*** MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

**** TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR

***** TEST TO BE PERFORMED IN SEQUENCE INDICATED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WR
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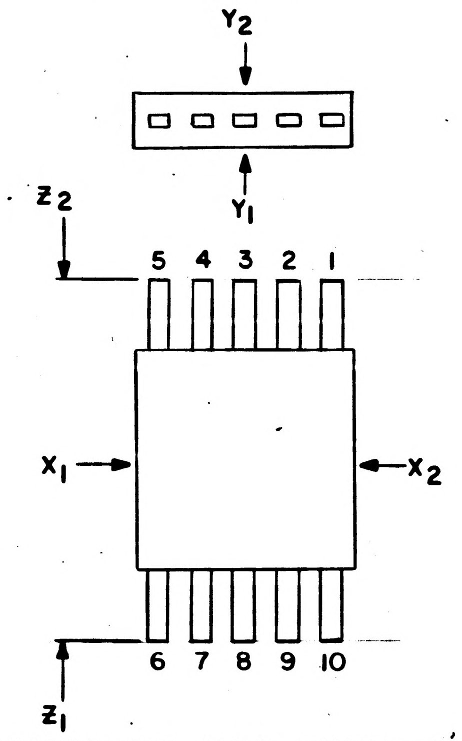
TABLE III

QUALITY DEMONSTRATION TESTS**

TEST	TEST CONDITION	LOT
SUBGROUP 1 PHYSICAL DIMENSION	SEE NOTE 3 C (3) METHOD 2066	LTPD* = 20 MAX. ACC. NO.=1
SUBGROUP 2***** THERMAL SHOCK SEAL TEST	SEE NOTE 3 C (4) METHOD 1056, CONDITION B (150°C TO -65°C, 5 CYCLES) SEE NOTE 3 D (3)	LTPD* = 7 (COMBINED) MAX. ACC. NO.=1
SUBGROUP 3***** STORAGE LIFE	SEE NOTE 3 C (4) METHOD 1031 tstg = 150 ± 5°C, 1000 HOURS	LTPD* = 5 (COMBINED) MAX. ACC. NO.= 1
SHOCK	METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN ALL AXIS DIRECTIONS 30 BLOWS TOTAL	
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM	
CONSTANT ACCELERATION	METHOD 2006, (20,000 G) Y1 & Y2 AXIS ONLY	
SUBGROUP 4 OPERATION LIFE	SEE NOTE 3 C (4) METHOD 1026 SEE NOTE 3 D (5) AND FIGURE 2 T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS	λ* = 3 MAX. ACC. NO. = 0
SUBGROUP 5***** LEAD TENSION LEAD FATIGUE	SEE NOTE 3 C (3) SEE NOTE 3 D (2) SEE NOTE 3 D (1)	LTPD* = 20 (COMBINED) MAX. ACC. NO.=1
SUBGROUP 6***** VISUAL INTERNAL INSPECTION	SEE NOTE 3 C (5) AND NOTE 3 D (7)	LTPD* = 15 MAX. ACC. NO=1
SUBGROUP 7***** EMITTER-BASE BACK BIAS	SEE NOTE 3 D (8) AND NOTE 3 C (5) t = 72 HOURS T_A = 100 ± 5°C	LTPD* = 10 MAX. ACC. NO=1



VIEW SHOWN FOR AXIS REFERENCE ONLY

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITIONS	LIMIT MIN	LIMIT MAX	UNITS
END POINTS FOR SUBGROUPS 2,3, AND 4		SAME AS SPECIFIED IN TABLE II			
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT CURRENT, PIN 1,9	I_0		.760	-	mA
COLLECTOR EMITTER THRESHOLD CURRENT	I_{CEX}		-	20	uA
BASE CURRENT, I 2,6	I_B		-	152	uA
BASE CURRENT, I 3,7	I_B		-	152	uA
BASE CURRENT, I 4,8	I_B		-	152	uA

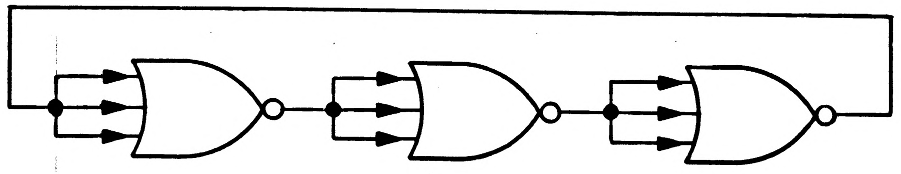


FIGURE 2
TEST CIRCUIT - POWER BURN IN

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LIST OF MATERIALS

NEXT ASSY	USED ON
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FRACTIONS ± — DECIMALS ± — ANGLES ± —
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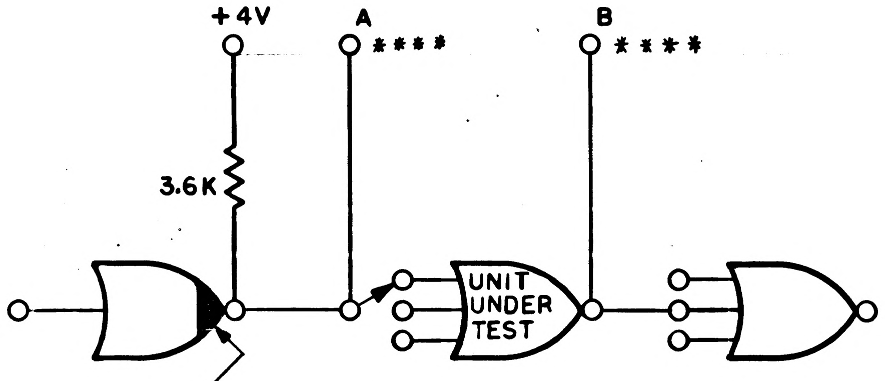
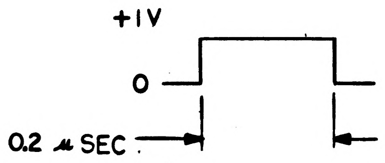
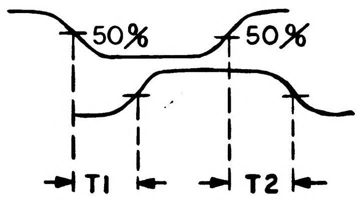


NO CONNECTION TO PIN 10

FIGURE I
AVERAGE PROPAGATION DELAY





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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO, THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, KEYING STRIPE AND THE NUMBER 321.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: QUALITY DEMONSTRATION PER TABLES I, II, AND III.

A. DEFINITION: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN. MAXIMUM SHIPPED NUMBER OF UNITS IN ANY LOT SHALL BE 5000 UNITS.

B. TEST CONDITIONS:

(1) THE TESTS AS DEFINED IN TABLES I, II, AND III SHALL BE PERFORMED BY THE QUALITY CONTROL DEPARTMENT OF THE VENDOR.

(2) UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCED TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.

(3) THE PRE-SEAL TEST PER TABLE I SHALL BE PERFORMED AFTER THE FINAL PRODUCTION INTERNAL VISUAL INSPECTION AND PRIOR TO SEALING.

C. VENDOR SUPPLIED DATA:

(1) DATA FROM TABLE I AND II SHALL ACCOMPANY THE LOT WHEN SHIPPED TO THE PURCHASER. UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III SHALL NOT BE SHIPPED AS PART OF THE DELIVERY BUT SHALL BE FORWARDED ALONG WITH THE TEST DATA FROM TABLE III UNDER SEPARATE COVER TO THE PURCHASER, ATTENTION: PURCHASING AGENT.

(2) THE DATA SUPPLIED PER TABLE I SHALL INCLUDE THE NUMBER OF SUB-LOTS TESTED, THE NUMBER OF UNITS THAT FAILED FROM EACH SUB-LOT, THE CAUSE OF FAILURE, AND THE NUMBER OF TIMES THE SUB-LOT WAS RE-SUBMITTED. THE MAXIMUM SIZE FOR ANY SUB-LOT SHALL BE 1000 UNITS.

(3) THE DATA SUPPLIED PER TABLE II SHALL INCLUDE THE NUMBER OF UNITS REJECTED PER THE TEST, THE CAUSE OF REJECTION, AND THE DATE CODE OF THE UNITS TESTED.

(4) THE DATA SUPPLIED PER TABLE III SHALL INCLUDE THE NUMBER OF UNITS REJECTED PER THE TEST, THE CAUSE FOR REJECTION BY SERIAL NUMBER AND THE DATE CODE OF THE UNITS.

D. SELECTION OF UNITS FOR TEST:

(1) THE SAMPLE USED FOR TABLE II SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A LOT.

(2) A LOT MAY BE RESUBMITTED FOR TABLE II AND TABLE III ONCE. THE REQUIREMENT OF MIL-S-1900c FOR LOT RESUBMITTAL SHALL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3, AND 4 OF TABLE III. IN TABLE III ACCEPTABLE UNITS FROM SUBGROUP 2 MAY BE USED IN SUBGROUP 5.

(5) AFTER COMPLETION OF TESTS, UNITS USED IN SUBGROUP 3 OF TABLE III SHALL BE USED IN SUBGROUPS 6 OF TABLE III.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
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APPROVED	L D Hanley	18 May 65
APPROVED	Eldon C. Hall	17 May 65
APPROVED MIT		18 May 65
APPROVED MSC	W J Rhine	5-18-65
		DATE

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E. DATE CODE:

(1) UNITS SHALL BE DATE CODED INDICATING THE WEEK SEALING OPERATION WAS PERFORMED. AN ADDITIONAL LETTER MAY BE ADDED TO THE DATE CODE TO SEPARATE LOTS FOR THE PURPOSE OF TRACEABILITY.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:

(1) VOLTAGE TO PIN 10: PLUS 10.0 VOLTS WITH RESPECT TO PIN 5.

(2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO PIN 5.

(3) THERMAL RESISTANCE, JUNCTION-CASE. (O_{JC}): 200°C/WATT.

(4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (O_{JA}): 500°C/WATT.

B. TEMPERATURE:

(1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.

(2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C.

(3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX).

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON, NPN.

(2) ENCLOSURE: SEE FIGURE, HERMETICALLY SEALED AND ELECTRICALLY ISOLATED FROM POWER OR GROUND.

(3) LEADS:
LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 WITH THE FOLLOWING EXCEPTIONS:

GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES, THE NICKEL STRIKE UNDER THE GOLD SHALL BE OPTIONAL BUT IF USED SHALL BE A MAXIMUM OF 100 MICRO INCHES, AND PARAGRAPH 3.4.2. SHALL NOT APPLY. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

4. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

A. LEAD FATIGUE: LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A 2 OUNCE WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED. A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 45 DEGREES FROM THE VERTICAL IN ONE DIRECTION, AND BACK 45 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

B. LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 1 POUND MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

C. SEAL TEST:

THE UNITS SHALL BE SUBJECTED TO THE LEAK TESTS AS SPECIFIED IN ND 1002246. A LEAKAGE RATE OF 5×10^{-8} cc/atm/sec OR GREATER SHALL CONSTITUTE A FAILURE.

D. AVERAGE PROPAGATION DELAY (T_p): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 1 MADE UP OF ACCEPTABLE UNITS WHERE $T_p = (T_1 + T_2)/2$. VOLTAGE 4V ± 10% DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

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CAPACITOR VALUES ARE IN µf
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FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL

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CHECKED		17-5-65
APPROVED	L D Hanley	18 May 65
APPROVED	Ellen C Hall	17 May 65
APPROVED MIT		18 May 65
APPROVED MSC		5-18-65

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HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321

SCALE | SHEET 2 OF 6

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REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
B		REDRAWN AND REVISED PER TDRR 19001			5-18-65	WL

E. OPERATION LIFE: AN ODD NUMBER OF UNITS (GATES) SHALL BE CONNECTED IN SERIES WITH THE OUTPUT OF THE LAST UNIT SUPPLYING THE INPUT TO THE FIRST UNIT, THUS FORMING A "RING" AS SHOWN IN FIGURE 2 WITH 8V ± 5% DC APPLIED TO THE POWER TERMINALS OF ALL UNITS IN THE CIRCUIT ("RING") OSCILLATION MUST OCCUR AT THE INITIATION OF THE TEST.

F. VISUAL AND MECHANICAL EXTERNAL EXAMINATION:

MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTRANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION (A) MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION. NO BODY PAINT SHALL BE ON THE LEADS OR PACKAGE SEAL AREA.

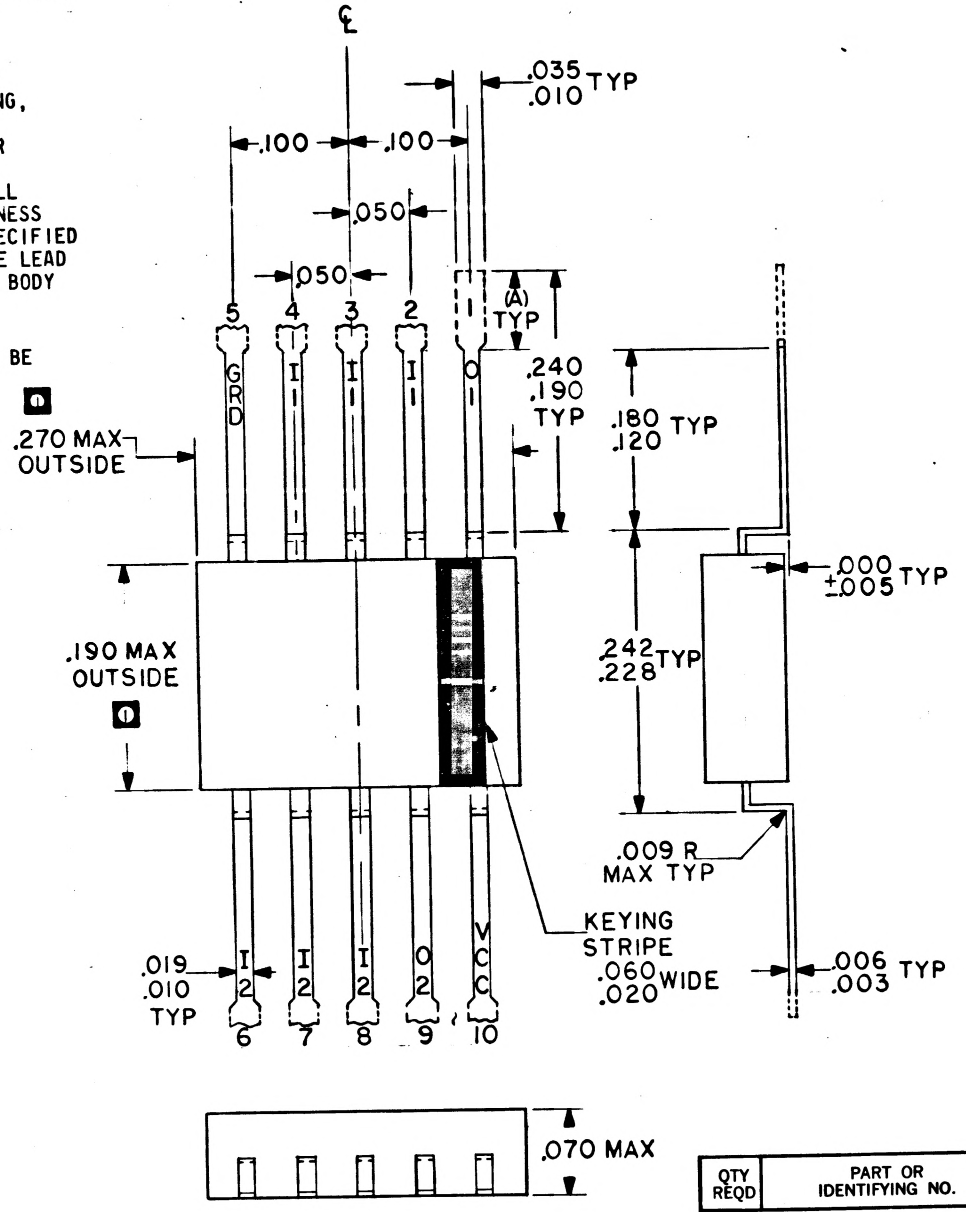
G. PRESEAL VISUAL INSPECTION: THE PRESEAL VISUAL INSPECTION SHALL BE PERFORMED USING THE REJECTION CRITERIA OF ND 1002257.

H. EMITTER-BASE BACK BIAS TEST: ALL BASE INPUTS SHALL HAVE MINUS 4 VOLTS WITH RESPECT TO THE COMMON EMITTER CONNECTION. THE DC CURRENT OF TABLE II SHALL BE PERFORMED BEFORE AND AFTER THE EMITTER-BASE BACK BIAS TEST WITH A MAXIMUM TOLERABLE CHANGE IN BETA OF ±10%.

TABLE I

PRE SEAL VISUAL INSPECTION		
TEST	TEST CONDITIONS	SUB LOT
VISUAL INTERNAL INSPECTION	SEE NOTE 2C(2) AND 4G	LTPD* = 7 MAX ACC NO = 1

① MAX BODY DIMENSIONS INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005 OF ℄ OF PIN 1. LEAD DIMENSIONS TO BE MEASURED WITHIN .030 OF PACKAGE BODY.



MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

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HOUSTON, TEXAS

		DATE
DRAWN	J.B. Murphy	21 APR 65
CHECKED		17 May 65
APPROVED	L.D. Hanley	18 May 65
APPROVED	Eldon C. Hall	17 May 65
APPROVED MIT		18 May 65
APPROVED MSC	W. J. Rhine	5-18-65

DUAL NOR GATE (FLAT PACK)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006321
SCALE NONE
SHEET 3 OF 6

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WH
A	REVISED PER TDRR 17886	4/4/65	WH
B	REVISED PER TDRR 19001	5-18-65	WH

TABLE II

ACCEPTANCE INSPECTION **

TEST ***	SYMBOL	TEST CONDITIONS						LIMITS MIN	LIMITS MAX	UNITS	LOT
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE NOTE 3 D (6)						-	-		*LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2,6	PIN 3,7	PIN 5	PIN 4,8	PIN 1,9	PIN 10				
BASE CURRENT BASE CURRENT BASE CURRENT	I_B I_B I_B	+870±2mV +1800±10mV +1800±10mV	+1800±10mV +870±2mV +1800±10mV	0V 0V 0V	+1800±10mV +1800±10mV +870±2mV		+4±.01V +4±.01V +4±.01V		152 152 152	uA uA uA	*LPTD = 1.0 MAX. ACC. NO. 2 (COMBINED)
OUTPUT VOLT. PIN 1,9 OUTPUT VOLT. PIN 1,9 OUTPUT VOLT. PIN 1,9	V_O V_O V_O	+770±2mV OPEN OPEN	OPEN +770±2mV OPEN	0V 0V 0V	OPEN OPEN +770±2mV		+4±.01V +4±.01V +4±.01V		300 300 300	mV mV mV	
SAT. VOLT. PIN 1,9 SAT. VOLT. PIN 1,9 SAT. VOLT. PIN 1,9	V_S V_S V_S	+870±2mV OPEN OPEN	OPEN +870±2mV OPEN	0V 0V 0V	OPEN OPEN +870±2mV		+4±.01V +4±.01V +4±.01V		220 220 220	mV mV mV	*LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
OUTPUT CURRENT PIN 1,9 COLLECTOR-EMITTER THRESHOLD CURRENT	I_O I_{CEX}	+500±2mV +500±2mV	+500±2mV +500±2MV	0V 0V	+500±2mV +500±2mV	+870±2mV +1.00±.01V	+4±.01V OPEN	760	15	uA uA	
COLLECT. CUTOFF CURRENT EMITTER CUTOFF CURRENT COLLECT. CUTOFF CURRENT	I_{CEO} I_{EBO} I_{CBO}	OPEN 0V 0V	OPEN 0V 0V	0V +4±.1V OPEN	OPEN 0V 0V	+5±.1V OPEN +8±.1V	OPEN OPEN OPEN		100 100 100	uA uA uA	
INTERFACE TEST	B_1	870±2mV	OPEN	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_2	OPEN	870±2mV	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_3	OPEN	OPEN	0V	870±2mV	5KΩ TO +10V	OPEN		400	mV	
COLLECTOR EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST.	I_C = 5mA (PULSED) PINS 1,9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_P	SEE NOTE 3D (4) AND FIGURE 1							24	nsec	*LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 10 AND 1,9 MEASUREMENT CURRENT = 1mA						2.7	4.15	Kohms	*LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		*LTPD = 7 MAX. ACC. NO. = 1

* LTPD PER MIL-S-19500C, TABLE IV

** SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV

*** MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

**** TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR

***** TEST TO BE PERFORMED IN SEQUENCE INDICATED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
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DWG. NO. CONTRACT
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CHECKED L D Hanley
APPROVAL L D Hanley
APPROVAL Eldon C Hall 30 Dec 64
NASA APPROVAL W J Rhine 12-29-64
MIT APPROVAL 1/26/65

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SPECIFICATION CONTROL DRAWING

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SIZE C
NASA DRAWING NO. 1006321
SCALE —
WT
SHEET 4 OF 6

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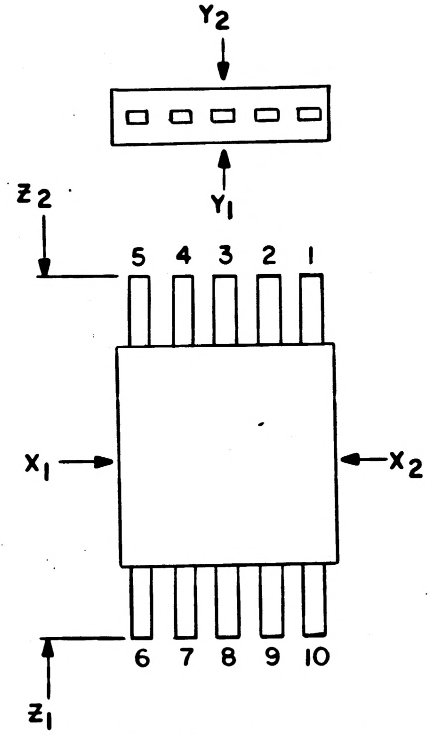
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WR
A	REVISED PER TDRR 17886	4/21/65	WR
B	REVISED PER TDRR 19001	5-18-65	WR

TABLE III

QUALITY DEMONSTRATION TESTS**

TEST	TEST CONDITION	LOT
SUBGROUP 1 PHYSICAL DIMENSION	SEE NOTE 2 D(3) METHOD 2066	LTPD* = 20 MAX.ACC.NO.=1
SUBGROUP 2***** THERMAL SHOCK SEAL TEST	SEE NOTE 2 D(4) METHOD 1056, CONDITION B (150°C TO -65°C, 5 CYCLES) SEE NOTE 4 C	LTPD* = 7 (COMBINED) MAX.ACC.NO.=1
SUBGROUP 3***** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	SEE NOTE 2D(4) METHOD 1031 tstg = 150 ± 5°C, 1000 HOURS METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN ALL AXIS DIRECTIONS 30 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM METHOD 2006, (20,000 G) Y1 & Y2 AXIS ONLY	LTPD* = 5 (COMBINED) MAX.ACC.NO.= 1
SUBGROUP 4 OPERATION LIFE	SEE NOTE 2 D (4) METHOD 1026 SEE NOTE 4 E AND FIGURE 2 T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS	λ* = 3 MAX.ACC.NO. = 0
SUBGROUP 5***** LEAD TENSION LEAD FATIGUE	SEE NOTE 2D(3) SEE NOTE 4A SEE NOTE 4B	LTPD* = 20 (COMBINED) MAX.ACC.NO.=1
SUBGROUP 6**** EMITTER-BASE BACK BIAS	SEE NOTE 4H (8) AND NOTE 2 D(5) t = 72 HOURS T_A = 100 ± 5°C	LTPD* = 15 MAX.ACC.NO=2



VIEW SHOWN FOR AXIS REFERENCE ONLY

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITIONS	LIMIT MIN	LIMIT MAX	UNITS
END POINTS FOR SUBGROUPS 2, 3, 4 AND 6		SAME AS SPECIFIED IN TABLE II			
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT CURRENT, PIN 1,9	I_0		760	-	μA
COLLECTOR EMITTER THRESHOLD CURRENT	I_{CEX}		-	20	uA
BASE CURRENT, I 2,6	I_B		-	152	uA
BASE CURRENT, I 3,7	I_B		-	152	uA
BASE CURRENT, I 4,8	I_B		-	152	uA

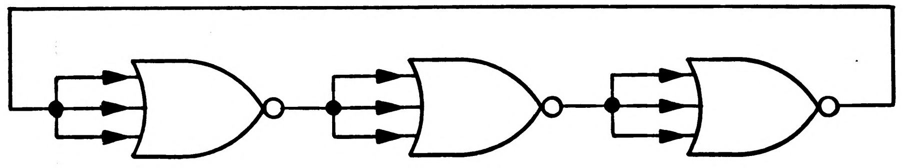


FIGURE 2
TEST CIRCUIT - POWER BURN IN

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
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DRAWN A. Addario Jr. DATE 24DEC 64
CHECKED L D Hanley
APPROVAL L D Hanley
APPROVAL Eldon C Hall 28 Dec 64
NASA APPROVAL W J Rhine 12-29-64
MIT APPROVAL W Gyffe 29 Dec 64 1/26/65

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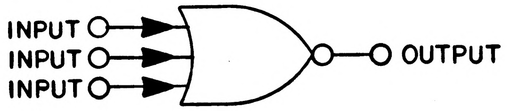
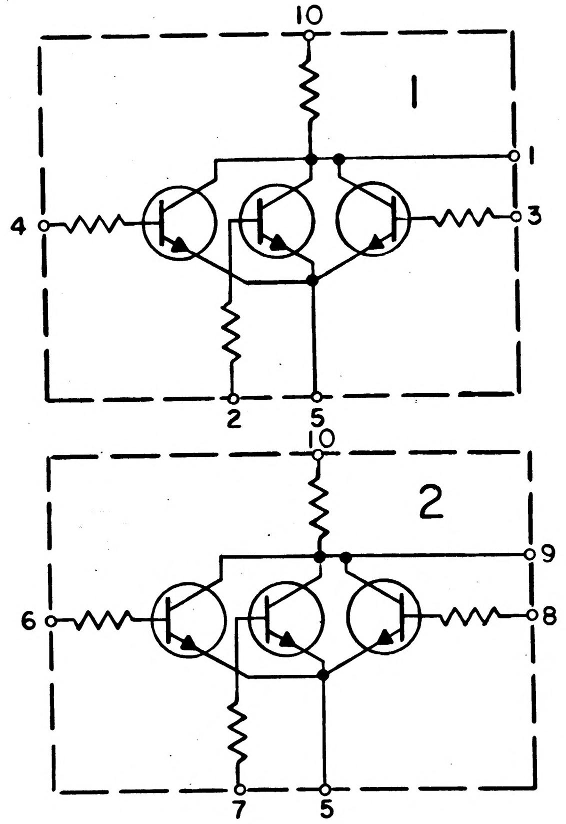
1006321 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WK
A	REVISED PER TDRR 17886	4/21/65	WK
B	THIS SHEET ADDED PER TDRR 19001	5-18-65	WK

LOGIC SYMBOL





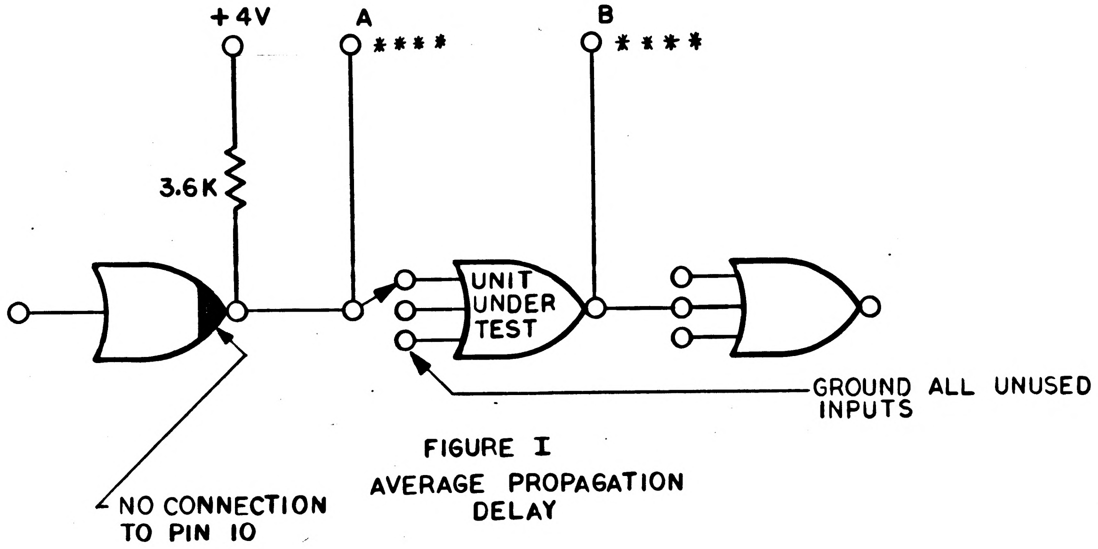
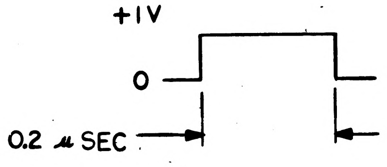
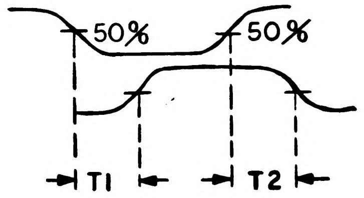


FIGURE I
AVERAGE PROPAGATION DELAY



INPUT PULSE



Ⓑ THIS SHEET ADDED

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LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
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B		REDRAWN AND REVISED PER TDRR 19001			5-18-65	WK
C		REPLACED BY REV D WITH CHANGES PER TDRR 19259				WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO, THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, KEYING STRIPE AND THE NUMBER 321.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: QUALITY DEMONSTRATION PER TABLES I, II, AND III.

A. DEFINITION: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN. MAXIMUM SHIPPED NUMBER OF UNITS IN ANY LOT SHALL BE 5000 UNITS.

B. TEST CONDITIONS:

(1) THE TESTS AS DEFINED IN TABLES I, II, AND III SHALL BE PERFORMED BY THE QUALITY CONTROL DEPARTMENT OF THE VENDOR.

(2) UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCED TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.

(3). THE PRE-SEAL TEST PER TABLE I SHALL BE PERFORMED AFTER THE FINAL PRODUCTION INTERNAL VISUAL INSPECTION AND PRIOR TO SEALING.

C. VENDOR SUPPLIED DATA:

(1) DATA FROM TABLE I AND II SHALL ACCOMPANY THE LOT WHEN SHIPPED TO THE PURCHASER. UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III SHALL NOT BE SHIPPED AS PART OF THE DELIVERY BUT SHALL BE FORWARDED ALONG WITH THE TEST DATA FROM TABLE III UNDER SEPARATE COVER TO THE PURCHASER, ATTENTION: PURCHASING AGENT.

(2) THE DATA SUPPLIED PER TABLE I SHALL INCLUDE THE NUMBER OF SUB-LOTS TESTED, THE NUMBER OF UNITS THAT FAILED FROM EACH SUB-LOT, THE CAUSE OF FAILURE, AND THE NUMBER OF TIMES THE SUB-LOT WAS RE-SUBMITTED. THE MAXIMUM SIZE FOR ANY SUB-LOT SHALL BE 1000 UNITS.

(3) THE DATA SUPPLIED PER TABLE II SHALL INCLUDE THE NUMBER OF UNITS REJECTED PER THE TEST, THE CAUSE OF REJECTION, AND THE DATE CODE OF THE UNITS TESTED.

(4) THE DATA SUPPLIED PER TABLE III SHALL INCLUDE THE NUMBER OF UNITS REJECTED PER THE TEST, THE CAUSE FOR REJECTION BY SERIAL NUMBER AND THE DATE CODE OF THE UNITS.

D. SELECTION OF UNITS FOR TEST:

(1) THE SAMPLE USED FOR TABLE II SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A LOT.

(2) A LOT MAY BE RESUBMITTED FOR TABLE II AND TABLE III ONCE. THE REQUIREMENT OF MIL-S-1900c FOR LOT RESUBMITTAL SHALL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3, AND 4 OF TABLE III. IN TABLE III ACCEPTABLE UNITS FROM SUBGROUP 2 MAY BE USED IN SUBGROUP 5.

(5) AFTER COMPLETION OF TESTS, UNITS USED IN SUBGROUP 3 OF TABLE III SHALL BE USED IN SUBGROUPS 6 OF TABLE III.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

Ⓒ REPLACED BY REV (D) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

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CAMBRIDGE, MASS.

		DATE
DRAWN	A. Martos	5-5-65
CHECKED		17-5-65
APPROVED	L D Hanley	18 May 65
APPROVED	Eldon C. Hall	17 May 65
APPROVED MIT		18 May 65
APPROVED MSC	W J	5-18-65

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006321
SCALE
SHEET 1 OF 6

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B		REDRAWN AND BEVISED PER TDRR 19001			5-1965	WK(
C		REPLACED BY REV D WITH CHANGES PER TDRR 19259				Wl

E. DATE CODE:

(1) UNITS SHALL BE DATE CODED INDICATING THE WEEK SEALING OPERATION WAS PERFORMED. AN ADDITIONAL LETTER MAY BE ADDED TO THE DATE CODE TO SEPARATE LOTS FOR THE PURPOSE OF TRACEABILITY.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:

(1) VOLTAGE TO PIN 10: PLUS 10.0 VOLTS WITH RESPECT TO PIN 5.

(2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO PIN 5.

(3) THERMAL RESISTANCE, JUNCTION-CASE. (O_{JC}): 200°C/WATT.

(4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (O_{JA}): 500°C/WATT.

B. TEMPERATURE:

(1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.

(2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C.

(3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX).

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON, NPN.

(2) ENCLOSURE: SEE FIGURE, HERMETICALLY SEALED AND ELECTRICALLY ISOLATED FROM POWER OR GROUND.

(3) LEADS:
LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 WITH THE FOLLOWING EXCEPTIONS:

GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES, THE NICKEL STRIKE UNDER THE GOLD SHALL BE OPTIONAL BUT IF USED SHALL BE A MAXIMUM OF 100 MICRO INCHES, AND PARAGRAPH 3.4.2. SHALL NOT APPLY. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

4. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

A. LEAD FATIGUE: LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A 2 OUNCE WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED. A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 45 DEGREES FROM THE VERTICAL IN ONE DIRECTION, AND BACK 45 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

B. LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 1 POUND MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

C. SEAL TEST:

THE UNITS SHALL BE SUBJECTED TO THE LEAK TESTS AS SPECIFIED IN ND 1002246. A LEAKAGE RATE OF 5×10^{-8} cc/atm/sec OR GREATER SHALL CONSTITUTE A FAILURE.

D. AVERAGE PROPAGATION DELAY (T_P): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 1 MADE UP OF ACCEPTABLE UNITS WHERE $T_P = (T_1 + T_2)/2$. VOLTAGE 4V ± 10% DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

MASTER

(C) REPLACED BY REV(D) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	A. Marts	5-5-65
CHECKED		17-5-65
APPROVED	L D Hanley	18 May 65
APPROVED	Ellen Hall	17 May 65
APPROVED MIT		18 May 65
APPROVED MSC		5-18-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006321
SCALE
SHEET 2 OF 6

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
B		REDRAWN AND REVISED PER TDRR 19001			5-18-65	
C		REPLACED BY REV D WITH CHANGES PER TDRR 19259				WK

1 MAX BODY DIMENSIONS INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005 OF ℄ OF PIN 1. LEAD DIMENSIONS TOBE MEASURED WITHIN .030 OF PACKAGE BODY

E. OPERATION LIFE: AN ODD NUMBER OF UNITS (GATES) SHALL BE CONNECTED IN SERIES WITH THE OUTPUT OF THE LAST UNIT SUPPLYING THE INPUT TO THE FIRST UNIT, THUS FORMING A "RING" AS SHOWN IN FIGURE 2 WITH 8V ± 5% DC APPLIED TO THE POWER TERMINALS OF ALL UNITS IN THE CIRCUIT ("RING") OSCILLATION MUST OCCUR AT THE INITIATION OF THE TEST.

F. VISUAL AND MECHANICAL EXTERNAL EXAMINATION:

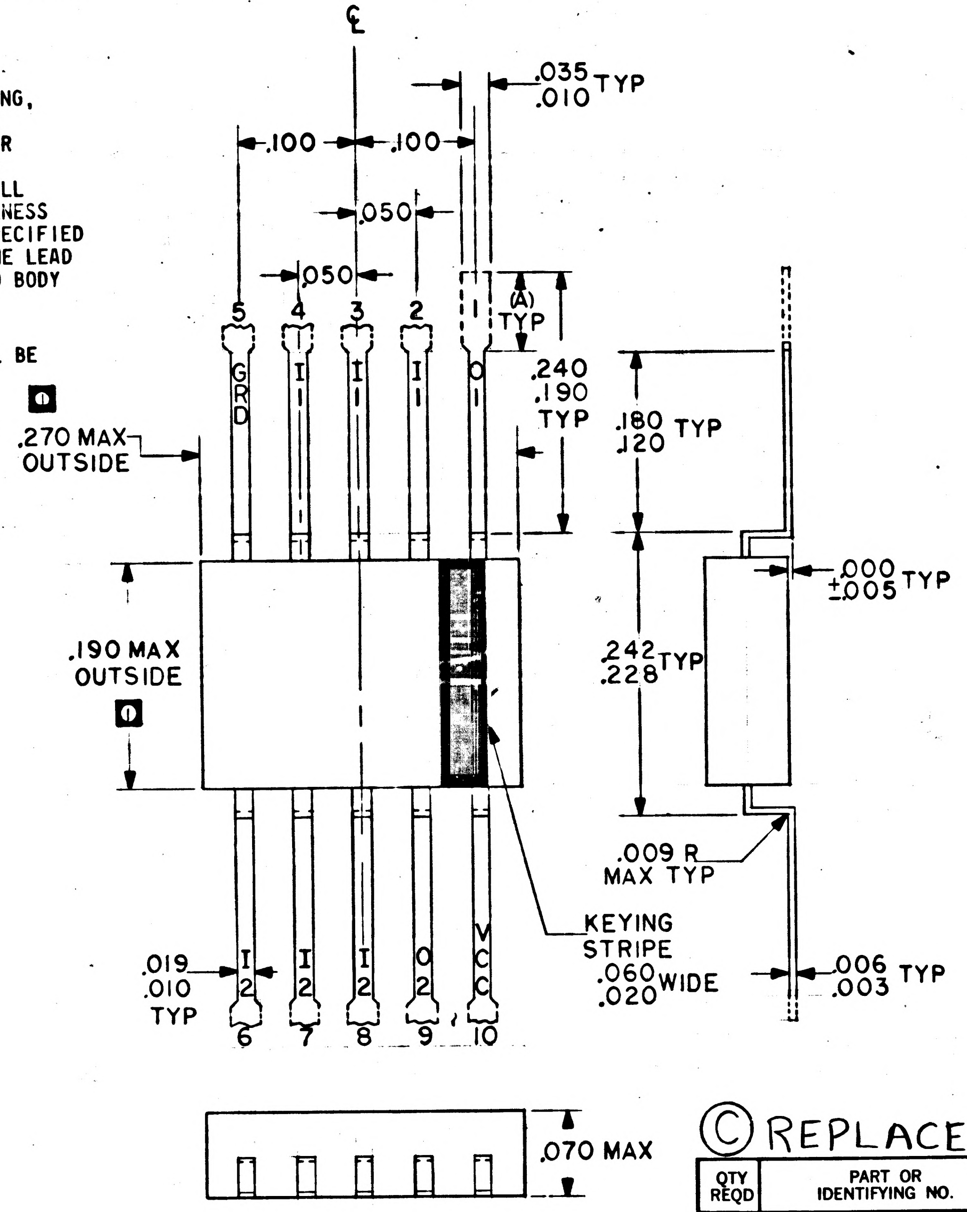
MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTRANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION (A) MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION. NO BODY PAINT SHALL BE ON THE LEADS OR PACKAGE SEAL AREA.

G. PRESEAL VISUAL INSPECTION: THE PRESEAL VISUAL INSPECTION SHALL BE PERFORMED USING THE REJECTION CRITERIA OF ND 1002257.

H. EMITTER-BASE BACK BIAS TEST: ALL BASE INPUTS SHALL HAVE MINUS 4 VOLTS WITH RESPECT TO THE COMMON EMITTER CONNECTION. THE DC CURRENT OF TABLE II SHALL BE PERFORMED BEFORE AND AFTER THE EMITTER-BASE BACK BIAS TEST WITH A MAXIMUM TOLERABLE CHANGE IN BETA OF ±10%.

TABLE I

PRE SEAL VISUAL INSPECTION		
TEST	TEST CONDITIONS	SUB LOT
VISUAL INTERNAL INSPECTION	SEE NOTE 2C(2) AND 4G	LTPD* = 7 MAX ACC NO = 1



MASTER

Ⓒ REPLACED BY REV(D) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	J B Murphy	21APR65
CHECKED		17May65
APPROVED	L D Hanley	18May65
APPROVED	Eldon C Hall	17May65
APPROVED MIT		18May65
APPROVED MSC		5-18-65

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DRAWING NO. 1006321
SCALE NONE
SHEET 3 OF 6

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1006321 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WK
A	REVISED PER TDRR 17886	4/26/65	WK
B	REVISED PER TDRR 19001	5-18-65	WK
C	REPLACED BY REV D WITH CHANGES PER TDRR 19259	1/26/66	WK

TABLE II

***		ACCEPTANCE INSPECTION **									
TEST	SYMBOL	TEST CONDITIONS						LIMITS MIN	LIMITS MAX	UNITS	LOT
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE NOTE 3 D (6)						-	-		*LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2,6	PIN 3,7	PIN 5	PIN 4,8	PIN 1,9	PIN 10				
BASE CURRENT	I_B	+870±2mV	+1800±10mV	0V	+1800±10mV		+4±.01V		152	uA	*LPTD = 1.0 MAX. ACC. NO. 2 (COMBINED)
BASE CURRENT	I_B	+1800±10mV	+870±2mV	0V	+1800±10mV		+4±.01V		152	uA	
BASE CURRENT	I_B	+1800±10mV	+1800±10mV	0V	+870±2mV		+4±.01V		152	uA	
OUTPUT VOLT. PIN 1,9	V_O	+770±2mV	OPEN	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT. PIN 1,9	V_O	OPEN	+770±2mV	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT. PIN 1,9	V_O	OPEN	OPEN	0V	+770±2mV		+4±.01V		300	mV	
SAT. VOLT. PIN 1,9	V_S	+870±2mV	OPEN	0V	OPEN		+4±.01V		220	mV	*LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
SAT. VOLT. PIN 1,9	V_S	OPEN	+870±2mV	0V	OPEN		+4±.01V		220	mV	
SAT. VOLT. PIN 1,9	V_S	OPEN	OPEN	0V	+870±2mV		+4±.01V		220	mV	
OUTPUT CURRENT PIN 1,9	I_O	+500±2mV	+500±2mV	0V	+500±2mV	+870±2mV	+4±.01V	760		uA	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	+500±2mV	+500±2MV	0V	+500±2mV	+1.00±.01V	OPEN		15	uA	
COLLECT. CUTOFF CURRENT	I_{CEO}	OPEN	OPEN	0V	OPEN	+5±.1V	OPEN		100	uA	
EMITTER CUTOFF CURRENT	I_{EBO}	0V	0V	+4±.1V	0V	OPEN	OPEN		100	uA	
COLLECT. CUTOFF CURRENT	I_{CBO}	0V	0V	OPEN	0V	+8±.1V	OPEN		100	uA	
INTERFACE TEST	B_1	870±2mV	OPEN	0V	OPEN	5KΩ TO +10V	OPEN	-	400	mV	
INTERFACE TEST	B_2	OPEN	870±2mV	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_3	OPEN	OPEN	0V	870±2mV	5KΩ TO +10V	OPEN		400	mV	
COLLECTOR EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST.	I_C = 5mA (PULSED) PINS 1,9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_P	SEE NOTE 3D (4) AND FIGURE 1							24	nsec	*LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 10 AND 1,9 MEASUREMENT CURRENT = 1mA						2.7	4.15	Kohms	*LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		*LTPD = 7 MAX. ACC. NO. = 1

* LTPD PER MIL-S-19500C, TABLE IV

** SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV

*** MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

**** TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR

***** TEST TO BE PERFORMED IN SEQUENCE INDICATED

Ⓒ REPLACED BY REV(D) WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
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DRAWN A. Addams DATE 22 DEC 64
CHECKED L D Hanley
APPROVAL L D Hanley
APPROVAL [illegible]
NASA APPROVAL W J Rhine 12-29-64
MIT APPROVAL [illegible] 12-29-64 1/26/65

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006321
SCALE —
WT
SHEET 4 OF 6

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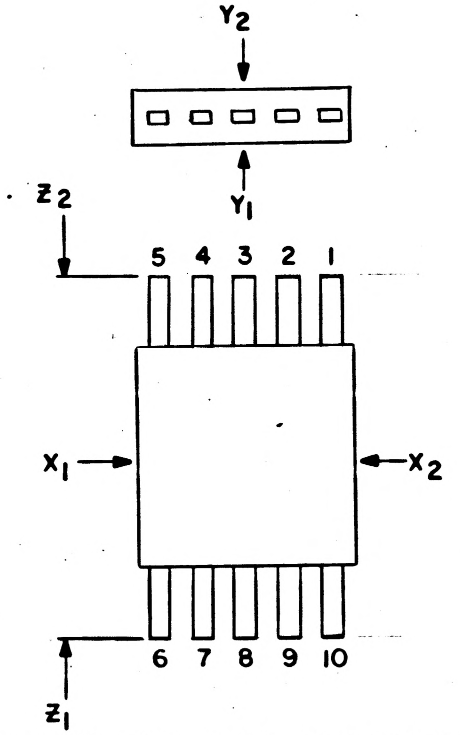
1006321 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WK
A	REVISED PER TDRR 17886	4/21/65	WK
B	REVISED PER TDRR 19001	5-18-65	WK
C	THIS SHEET DELETED PER TDRR 19259	6/2/65	WK

TABLE III

QUALITY DEMONSTRATION TESTS**		
TEST	TEST CONDITION	LOT
SUBGROUP 1 PHYSICAL DIMENSION	SEE NOTE 2 D(3) METHOD 2066	LTPD* = 20 MAX.ACC.NO.=1
SUBGROUP 2***** THERMAL SHOCK SEAL TEST	SEE NOTE 2 D(4) METHOD 1056, CONDITION B (150°C TO -65°C, 5 CYCLES) SEE NOTE 4 C	LTPD* = 7 (COMBINED) MAX.ACC.NO.=1
SUBGROUP 3***** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	SEE NOTE 2D(4) METHOD 1031 tstg = 150 ± 5°C, 1000 HOURS METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN ALL AXIS DIRECTIONS 30 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM METHOD 2006, (20,000 G) Y1 & Y2 AXIS ONLY	LTPD* = 5 (COMBINED) MAX.ACC.NO.= 1
SUBGROUP 4 OPERATION LIFE	SEE NOTE 2 D (4) METHOD 1026 SEE NOTE 4 E AND FIGURE 2 T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS	λ* = 3 MAX.ACC.NO.=0
SUBGROUP 5***** LEAD TENSION LEAD FATIGUE	SEE NOTE 2D(3) SEE NOTE 4A SEE NOTE 4B	LTPD* = 20 (COMBINED) MAX.ACC.NO.=1
SUBGROUP 6***** EMITTER-BASE BACK BIAS	SEE NOTE 4H (8) AND NOTE 2 D(5) t = 72 HOURS T_A = 100 ± 5°C	LTPD* = 15 MAX.ACC.NO=2



VIEW SHOWN FOR AXIS REFERENCE ONLY

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITIONS	LIMIT MIN	LIMIT MAX	UNITS
END POINTS FOR SUBGROUPS 2, 3, 4 AND 6					
OUTPUT VOLTAGE, PIN 1,9	V_0	SAME AS SPECIFIED IN TABLE II	-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT CURRENT, PIN 1,9	I_0		760	-	μA
COLLECTOR EMITTER THRESHOLD CURRENT	I_{CEX}		-	20	uA
BASE CURRENT, I 2,6	I_B		-	152	uA
BASE CURRENT, I 3,7	I_B		-	152	uA
BASE CURRENT, I 4,8	I_B		-	152	uA

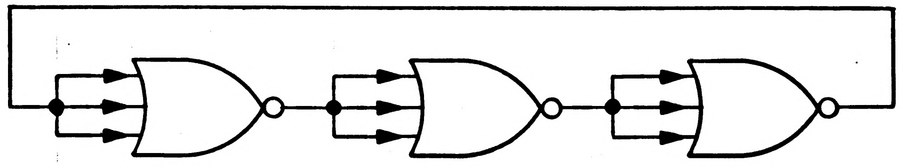


FIGURE 2
TEST CIRCUIT - POWER BURN IN

MASTER

Ⓒ THIS SHEET DELETED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——
DO NOT SCALE THIS DRAWING
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DRAWN A. Addario Jr. DATE 24DEC64
CHECKED L D Hanley
APPROVAL L D Hanley
APPROVAL Eldon C Hall 28 Dec 64
NASA APPROVAL W J Rhine 12-29-64
MIT APPROVAL 25 Dec 64 1/26/65

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SIZE C
NASA DRAWING NO. 1006321
SCALE NONE
WT ——
SHEET 5 OF 6

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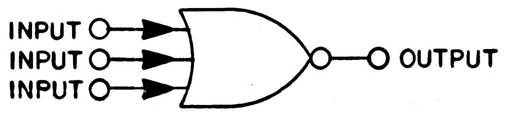
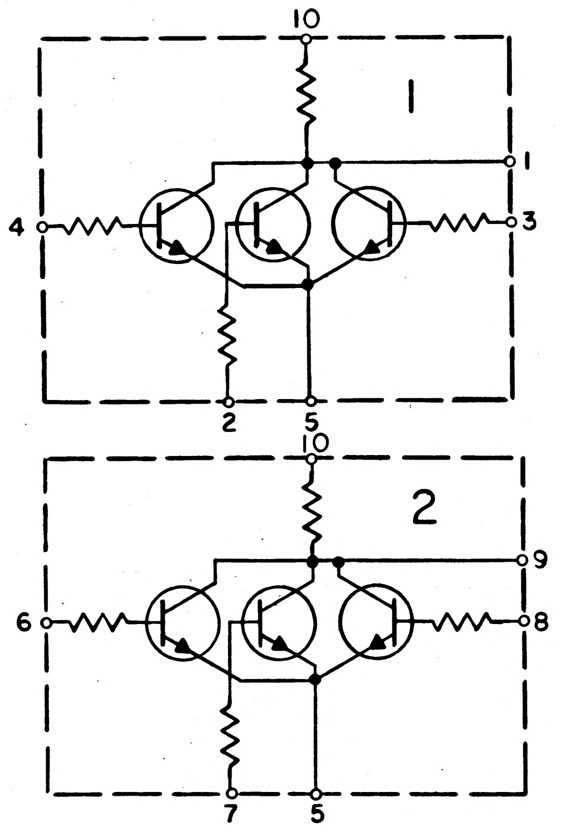
1006321 C

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WK
A	REVISED PER TDRR 17886	4/6/65	WK
B	THIS SHEET ADDED PER TDRR 19001	5-18-65	WK
C	REPLACED BY REV D WITH CHANGES PER TDRR 19259	6/4/65	WK

LOGIC SYMBOL





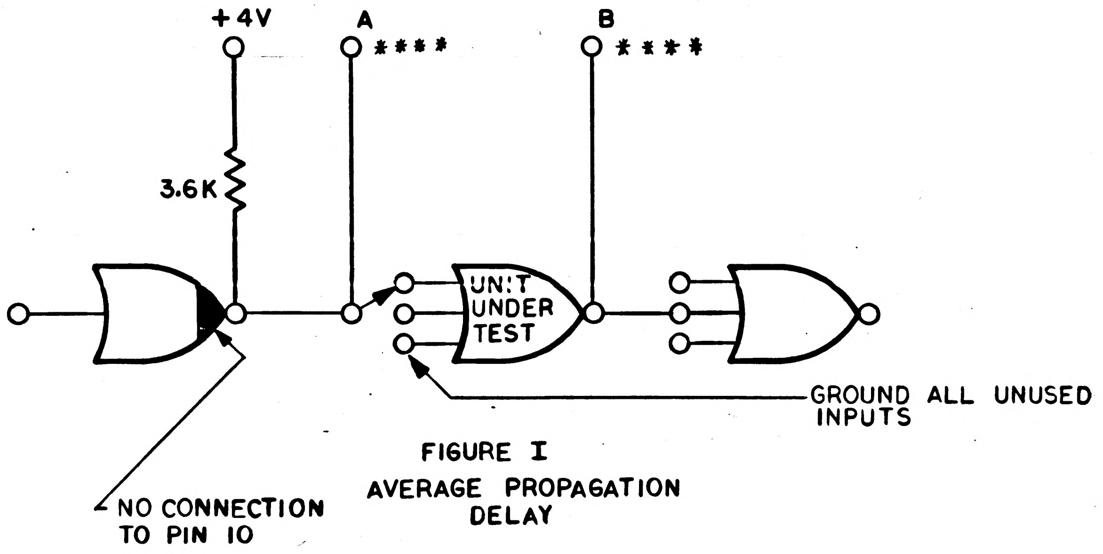
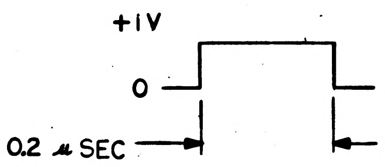
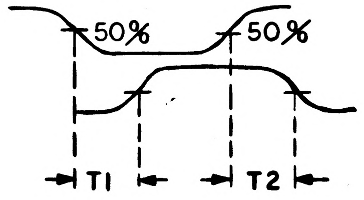


FIGURE I
AVERAGE PROPAGATION DELAY



INPUT PULSE



Ⓑ THIS SHEET ADDED

Ⓒ REPLACED BY REV(D) WITH CHANGES

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DRAWN A. Addario Jr DATE 22 DEC 64
CHECKED L D Hanley
APPROVAL L D Hanley
APPROVAL Eldon C Hall 28 Dec 64
NASA APPROVAL W J Rhine 12-28-64
MIT APPROVAL W Kupfer 1/26/65

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SCALE —
WT —
SHEET 6 OF 6

MASTER

1006321 D

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
C		REDRAWN AND REVISED PER TDRR19259				

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, DIFFUSION SUB-LOT CODE, KEYING STRIPE, AND THE NUMBER 321. THE BACK OF THE PACKAGE MAY BE UTILIZED FOR THE DIFFUSION SUB-LOT NUMBER.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

F. THE SHIPMENT LOTS, MADE UP OF UNITS AS SPECIFIED BY THIS DRAWING, MUST MEET THE REQUIREMENTS OF ND 1002248, WHEN PROCESSED AS SPECIFIED IN ND 1002248, PERFORMED AT THE BUYERS PLANT.

2. ACCEPTANCE AND INSPECTION: QUALITY DEMONSTRATION PER TABLES I AND II.

A. DEFINITIONS:

(1) A SHIPMENT LOT IS DEFINED AS A GROUP OF PARTS ASSEMBLED FROM DIFFUSION SUB-LOTS AND DATE CODES WHICH ARE SHIPPED AT ONE TIME WHICH HAVE BEEN FABRICATED IN A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A CONTROLLED PROCESS. NO PROCESS CHANGES DEFINED AS CRITICAL BY ND 1015404 NEGOTIATION MAY BE CHANGED DURING THE FABRICATION OF A SHIPMENT LOT. MAXIMUM NUMBER OF UNITS SHIPPED IN A LOT SHALL BE 5,000. A MAXIMUM OF 100 DIFFUSION SUB-LOTS MAY BE USED TO ASSEMBLE ONE SHIPMENT LOT. A SHIPMENT LOT MAY INCLUDE MORE THAN ONE DATE CODE LOT.

(2) A DIFFUSION SUB-LOT IS DEFINED AS A GROUP OF PARTS FABRICATED FROM MATERIALS WHICH WERE PROCESSED THROUGH DIFFUSION MASKING, ETCHING AND METALLIZATION AT ONE TIME (A SINGLE BATCH). THIS SUB-LOT IDENTIFICATION MUST BE MAINTAINED THROUGH SUBSEQUENT STAGES OF ASSEMBLY AND TEST. A DIFFUSION SUB-LOT SHALL BE SEALED WITH ONLY ONE DATE CODE.

(3) DATE CODE LOT IS DEFINED AS THOSE UNITS SEALED DURING ONE WEEK.

B. TEST CONDITIONS:

(1) THE TESTS AS DEFINED IN TABLES I & II SHALL BE PERFORMED BY THE QUALITY CONTROL DEPARTMENT OF THE VENDOR.

(2) UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCED TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.

(3) THE PRE-SEAL TEST PER TABLE I SHALL BE PERFORMED AFTER THE FINAL PRODUCTION INTERNAL VISUAL INSPECTION AND PRIOR TO SEALING.

C. VENDOR SUPPLIED INFORMATION: THE FOLLOWING DATA AND INFORMATION IS TO BE SUPPLIED WITH EACH SHIPMENT. ALL INFORMATION SUPPLIED WILL REFERENCE THE UNIT PART NUMBER, APPLICABLE PURCHASE ORDER NUMBER, QUANTITY AND DATE OF SHIPMENT, AND THE APPLICABLE DATE CODES OR DIFFUSION LOT CODES.

(1) A CERTIFICATE OF COMPLIANCE COVERING LEAD MATERIAL REQUIREMENTS OF PARAGRAPH 3.C.(3).

(2) A CERTIFICATE OF COMPLIANCE COVERING THE REQUIREMENTS OF ND 1015404.

(3) THE NOMINAL LEAD DIMENSIONS AS REQUIRED BY PARAGRAPH 2.E.

(4) THE PRESEAL INSPECTION DATA REQUIRED BY PARAGRAPH 4.C.

(5) THE SUBGROUP 1 AND 3 TEST DATA REQUIRED BY TABLE II.

D. SELECTION OF UNITS FOR TEST:

(1) THE SAMPLE USED FOR TABLE II SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A SHIPMENT LOT.

(2) A SHIPMENT LOT MAY BE RESUBMITTED FOR TABLE II SUBGROUP 1 AND 3. THE REQUIREMENT OF MIL-S-1900c GROUP 1 & 3 FOR LOT RESUBMITTAL SHALL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

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HOUSTON, TEXAS

DRAWN	H. Wong	27 MAY 65
CHECKED	A. Martz	6-2-65
APPROVED	D Hanley	1 Jun 65
APPROVED	Eldon C Hall	2 Jun 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC	W J Rhine	6-2-65
		DATE

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321

SCALE NONE
SHEET 1 OF 5

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D	1006321

REVISIONS							
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
D		REDRAWN AND REVISED PER TBRR 19259					

2. E. LEAD DIMENSIONS: THE PARTS SUPPLIED IN ANY SHIPMENT LOT MUST BE UNIFORM WITH RESPECT TO LEAD DIMENSIONS. THE LEAD THICKNESS SHALL BE WITHIN ± 0.0005 INCHES OF A NOMINAL VALUE TO BE SPECIFIED BY THE VENDOR. THE LEAD WIDTH SHALL BE WITHIN ± 0.001 INCHES OF A NOMINAL VALUE ALSO TO BE SUPPLIED. THE NOMINAL VALUES FOR EACH SHIPPING LOT WILL BE SUPPLIED WITH THE APPLICABLE SHIPMENT.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:

(1) VOLTAGE TO PIN 10: PLUS 10.0 VOLTS WITH RESPECT TO PIN 5.

(2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO PIN 5.

(3) THERMAL RESISTANCE, JUNCTION-CASE. (O_{JC}): 200°C/WATT.

(4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (O_{JA}): 500°C/WATT.

B. TEMPERATURE:

(1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.

(2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C.

(3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX).

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON, NPN.

(2) ENCLOSURE: A HERMETICALLY SEALED PACKAGE ELECTRICALLY ISOLATED FROM POWER OR GROUND, THE DIMENSIONS OF WHICH MEET THE REQUIREMENTS OF FIGURE 1 AND PARAGRAPH 2.E.

(3) LEADS:

LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 WITH THE FOLLOWING EXCEPTIONS:

GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES. THE NICKEL STRIKE UNDER THE GOLD SHALL BE OPTIONAL BUT IF USED SHALL BE A MAXIMUM OF 100 MICRO INCHES, AND PARAGRAPH 3.4.2 SHALL NOT APPLY. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

4. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

A. AVERAGE PROPAGATION DELAY (T_p): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE I MADE UP OF ACCEPTABLE UNITS WHERE $T_p = (T_1 + T_2)/2$. VOLTAGE 4V ± 10% DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

MASTER

Ⓓ REPLACES REV Ⓒ WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

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DRAWN	H. Wong	27 MAY 65
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APPROVED	R D Hanley	1 Jun 65
APPROVED	Eldon C Hall	2 Jun 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC	W J Rhine	6-2-65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321
SCALE NONE		SHEET 2 OF 5

D 1006321

SYM	DESCRIPTION	DATE	APPROVED
D	REDRAWN AND REVISED PER TDRR 19259		

B. VISUAL AND MECHANICAL EXTERNAL EXAMINATION:

MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTRANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION (A) MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION. NO BODY PAINT SHALL BE ON THE LEADS OR PACKAGE SEAL AREA.

C. PRESEAL VISUAL INSPECTION: THE PRESEAL VISUAL INSPECTION SHALL BE PERFORMED USING THE REJECTION CRITERIA OF ND 1002257 REV A. THE DIFFUSION SUBLOT SHALL BE UTILIZED FOR SAMPLING SPECIFIED IN TABLE I. DATA SHALL ACCOMPANY EACH SHIPMENT COVERING THE NUMBER OF SUB-LOTS TESTED, THE NUMBER OF UNITS THAT FAILED FROM EACH SUB-LOT, THE CAUSE OF FAILURE, AND THE NUMBER OF TIMES EACH SUB-LOT WAS RESUBMITTED TO TABLE I TEST.

① MAX BODY DIMENSIONS INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005 OF ℄ OF PIN 1. LEAD DIMENSIONS TO BE MEASURED WITHIN .030 OF PACKAGE BODY.

② SEE PARAGRAPH 2.E.

TABLE I

PRE SEAL VISUAL INSPECTION		
TEST	TEST CONDITIONS	DIFFUSION SUB-LOT
VISUAL INTERNAL INSPECTION	SEE NOTE 2.C.(4) AND 4.C.	LTPD* = 7 MAX ACC NO. = 1

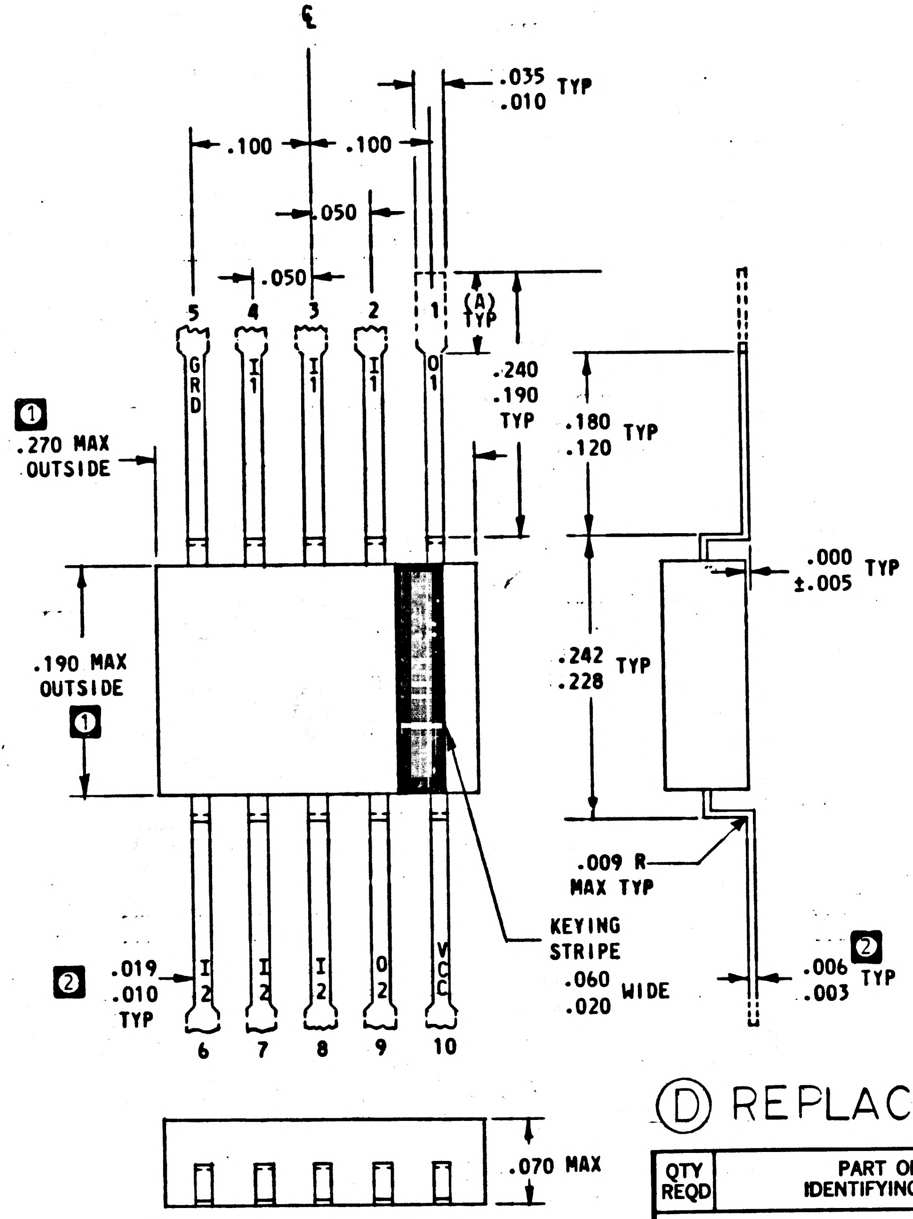

FIGURE 1

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO. CONTRACT
DRAWN H. Wong DATE 24MAY65
CHECKED A. Marts 6-2-65
APPROVAL L. D. Hanley 1 Jun 65
APPROVAL Eldon C. Hall 2 Jun 65
APPROVAL
NASA APPROVAL W J Rhine 6-2-65
MIT APPROVAL
MIT APPROVAL 2 Jun 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 | SIZE C | NASA DRAWING NO. 1006321
SCALE NONE | WT | SHEET 3 OF 5

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
D		REDRAWN AND REVISED PER TDRR 19259				

TABLE II

ACCEPTANCE INSPECTION **

TEST	SYMBOL	TEST CONDITIONS						LIMITS		UNITS	LOT
								MIN	MAX		
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE NOTE 3 D (6)						-	-		*LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2.6	PIN 3.7	PIN 5	PIN 4.8	PIN 1.9	PIN 10				↑ 100% TESTING REQUIRED
BASE CURRENT	I_B	+870±2mV	+1800±10mV	0V	+1800±10mV		+4±.01V		152	uA	
BASE CURRENT	I_B	+1800±10mV	+870±2mV	0V	+1800±10mV		+4±.01V		152	uA	
BASE CURRENT	I_B	+1800±10mV	+1800±10mV	0V	+870±2mV		+4±.01V		152	uA	
OUTPUT VOLT PIN 1.9	V_O	+770±2mV	OPEN	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	+770±2mV	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	OPEN	0V	+770±2mV		+4±.01V		300	mV	
SAT VOLT PIN 1.9	V_S	+870±2mV	OPEN	0V	OPEN		+4±.01V		220	mV	
SAT VOLT PIN 1.9	V_S	OPEN	+870±2mV	0V	OPEN		+4±.01V		220	mV	
SAT VOLT PIN 1.9	V_S	OPEN	OPEN	0V	+870±2mV		+4±.01V		220	mV	
OUTPUT CURRENT PIN 1.9	I_O	+500±2mV	+500±2mV	0V	+500±2mV	+870±2mV	+4±.01V	760		uA	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	+500±2mV	+500±2mV	0V	+500±2mV	+1.00±.01V	OPEN		15	uA	↓
SUBGROUP 3											*LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
COLLECT CUTOFF CURRENT	I_{CEO}	OPEN	OPEN	0V	OPEN	+5±.1V	OPEN		100	uA	
EMITTER CUTOFF CURRENT	I_{EBO}	0V	0V	+4±.1V	0V	OPEN	OPEN		100	uA	
COLLECT CUTOFF CURRENT	I_{CBO}	0V	0V	OPEN	0V	+8±.1V	OPEN		100	uA	
INTERFACE TEST	B_1	870±2mV	OPEN	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_2	OPEN	870±2mV	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_3	OPEN	OPEN	0V	870±2mV	5KΩ TO +10V	OPEN		400	mV	
COLLECTOR EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	I_C = 5 mA (PULSED) PINS 1.9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_p	SEE NOTE 3D (4) AND FIGURE 1							24	nsec	*LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 10 AND 1.9 MEASUREMENT CURRENT = 1 mA						2.7	4.15	Kohms	*LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1 mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		*LTPD = 7 MAX. ACC. NO. = 1

* LTPD PER MIL-S-19500C, TABLE IV

** SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV.

*** MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

**** TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR.

***** TEST TO BE PERFORMED IN SEQUENCE INDICATED.

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
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DRAWN	H. Wong	27MAY65
CHECKED	A. Marts	6-2-65
APPROVED	L D Hanley	1 Jun 65
APPROVED	Eldon C Hall	2 June 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC	W J Rhine	6-2-65
		DATE

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

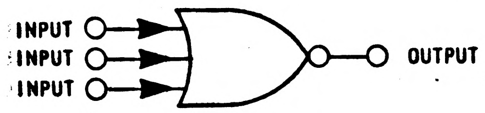
CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321
SCALE NONE		SHEET 4 OF 5

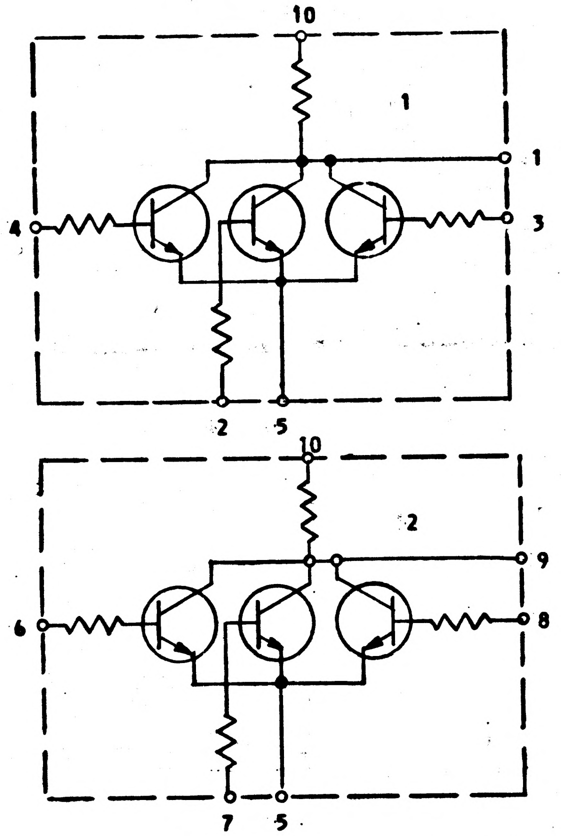
4 3 2 1

1006321 D

SYM	DESCRIPTION	DATE	APPROVED
D	REDRAWN AND REVISED PER TDRR 19259		

LOGIC SYMBOL


INPUT
INPUT
INPUT
OUTPUT


10
1
1
4
3
2
5
10
2
9
6
8
7
5

SCHEMATIC

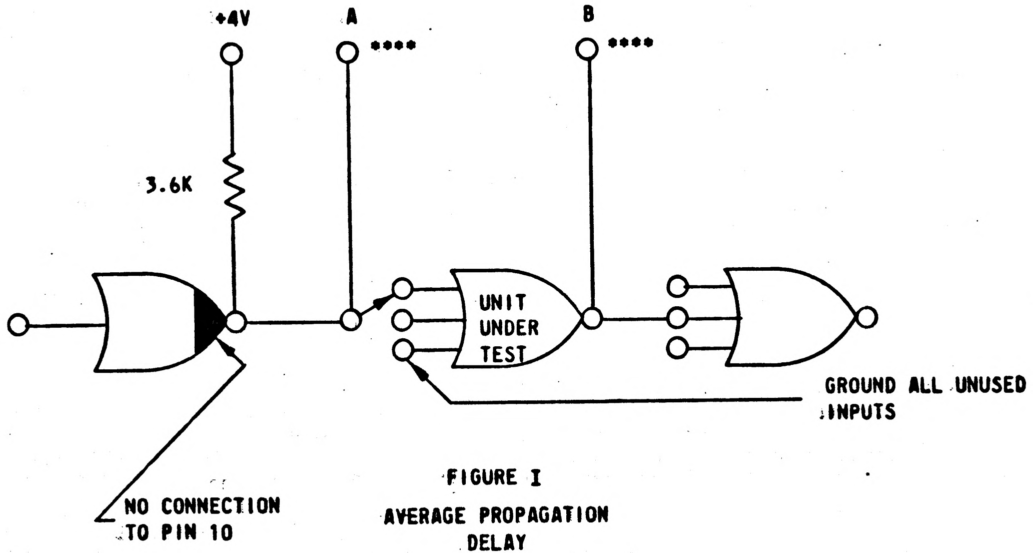
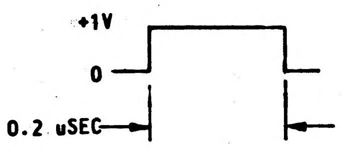
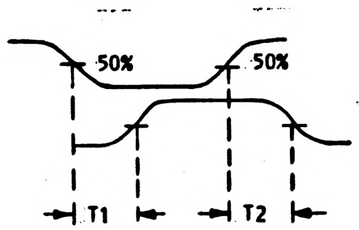

+4V
A ****
B ****
3.6K
UNIT UNDER TEST
GROUND ALL UNUSED INPUTS
NO CONNECTION TO PIN 10

FIGURE I

AVERAGE PROPAGATION DELAY



INPUT PULSE



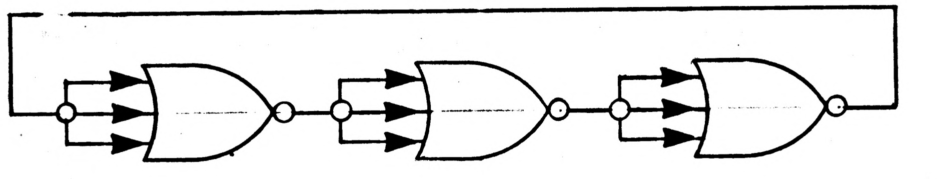


FIGURE 2

TEST CIRCUIT - POWER BURN IN

(D) REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. Wong DATE 24MAY65
CHECKED A. Maria 6-2-65
APPROVAL [illegible] 1 Jun 65
APPROVAL Eldon C Hall 2 June 65
APPROVAL
NASA APPROVAL W J [illegible] 6-2-65
MIT APPROVAL
MIT APPROVAL [illegible] 2 June 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006321
SCALE NONE	WT	SHEET 5 OF 5

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

4 3 2 1

1006321 E

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
D		REDRAWN AND REVISED PER TDRR 19259				
E		REVISED PER TDRR 20877			9/17/65	WR

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, DIFFUSION SUB-LOT CODE, KEYING STRIPE, AND THE NUMBER 321. THE BACK OF THE PACKAGE MAY BE UTILIZED FOR THE DIFFUSION SUB-LOT NUMBER.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

F. THE SHIPMENT LOTS, MADE UP OF UNITS AS SPECIFIED BY THIS DRAWING, MUST MEET THE REQUIREMENTS OF ND 1002248, WHEN PROCESSED AS SPECIFIED IN ND 1002248, PERFORMED AT THE BUYERS PLANT. LOTS OR SUBLOTS REJECTED BY THE CRITERIA OF PARA.4.3 OF ND 1002248 SHALL BE RETURNED TO THE VENDOR

2. ACCEPTANCE AND INSPECTION: QUALITY DEMONSTRATION PER TABLES I AND II

A. DEFINITIONS:

(1) A SHIPMENT LOT IS DEFINED AS A GROUP OF PARTS ASSEMBLED FROM DIFFUSION SUB-LOTS AND DATE CODES WHICH ARE SHIPPED AT ONE TIME WHICH HAVE BEEN FABRICATED IN A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A CONTROLLED PROCESS. NO PROCESS CHANGES DEFINED AS CRITICAL BY ND 1015404 NEGOTIATION MAY BE CHANGED DURING THE FABRICATION OF A SHIPMENT LOT. MAXIMUM NUMBER OF UNITS SHIPPED IN A LOT SHALL BE 5,000. A MAXIMUM OF 100 DIFFUSION SUB-LOTS MAY BE USED TO ASSEMBLE ONE SHIPMENT LOT. A SHIPMENT LOT MAY INCLUDE MORE THAN ONE DATE CODE LOT.

(2) A DIFFUSION SUB-LOT IS DEFINED AS A GROUP OF PARTS FABRICATED FROM MATERIALS WHICH WERE PROCESSED THROUGH DIFFUSION MASKING, ETCHING AND METALLIZATION AT ONE TIME (A SINGLE BATCH). THIS SUB-LOT IDENTIFICATION MUST BE MAINTAINED THROUGH SUBSEQUENT STAGES OF ASSEMBLY AND TEST. A DIFFUSION SUB-LOT SHALL BE SEALED WITH ONLY ONE DATE CODE.

(3) DATE CODE LOT IS DEFINED AS THOSE UNITS SEALED DURING ONE WEEK.

B. TEST CONDITIONS:

(1) THE TESTS AS DEFINED IN TABLES I & II SHALL BE PERFORMED BY THE QUALITY CONTROL DEPARTMENT OF THE VENDOR.

(2) UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCED TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.

(3) THE PRE-SEAL TEST PER TABLE I SHALL BE PERFORMED AFTER THE FINAL PRODUCTION INTERNAL VISUAL INSPECTION AND PRIOR TO SEALING.

C. VENDOR SUPPLIED INFORMATION: THE FOLLOWING DATA AND INFORMATION IS TO BE SUPPLIED WITH EACH SHIPMENT. ALL INFORMATION SUPPLIED WILL REFERENCE THE UNIT PART NUMBER, APPLICABLE PURCHASE ORDER NUMBER, QUANTITY AND DATE OF SHIPMENT, AND THE APPLICABLE DATE CODES OR DIFFUSION LOT CODES.

(1) A CERTIFICATE OF COMPLIANCE COVERING LEAD MATERIAL REQUIREMENTS OF PARAGRAPH 3.C.(3).

(2) A CERTIFICATE OF COMPLIANCE COVERING THE REQUIREMENTS OF ND 1015404.

(3) THE NOMINAL LEAD DIMENSIONS AS REQUIRED BY PARAGRAPH 2.E.

(4) THE PRESEAL INSPECTION DATA REQUIRED BY PARAGRAPH 4.C.

(5) THE SUBGROUP 1 AND 3 TEST DATA REQUIRED BY TABLE II. A SUMMARY OF TEST RESULTS OF SUBGROUPS 1&3, INCLUDING THE NUMBER OF UNITS TESTED & NUMBER OF FAILURES FOUND, SHALL BE SUBMITTED WITH EACH SHIPMENT LOT.

D. SELECTION OF UNITS FOR TEST:

(1) THE SAMPLE USED FOR TABLE II SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A SHIPMENT LOT.

(2) A SHIPMENT LOT MAY BE RESUBMITTED FOR TABLE II SUBGROUP 1&3, THE REQUIREMENT OF MIL-S-19500C GROUP 1&3 FOR LOT RESUBMITTAL SHALL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

Ⓓ REPLACES REV(C)WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

		DATE
DRAWN	H. Wong	27 MAY 65
CHECKED		6-2-65
APPROVED	D Hanley	1 Jun 65
APPROVED	Eldon C Hall	2 June 65
APPROVED MIT		2 Jun 65
APPROVED MSC		6-2-65

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321
SCALE NONE		SHEET 1 OF 5

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E	1006321

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
D		REDRAWN AND REVISED PER TDRR 19259				
E		REVISED PER TDRR 20877			8/17/65	WK

2. E. LEAD DIMENSIONS: THE PARTS SUPPLIED IN ANY SHIPMENT LOT MUST BE UNIFORM WITH RESPECT TO LEAD DIMENSIONS. THE LEAD THICKNESS SHALL BE WITHIN ± 0.0005 INCHES OF A NOMINAL VALUE TO BE SPECIFIED BY THE VENDOR. THE LEAD WIDTH SHALL BE WITHIN ± 0.001 INCHES OF A NOMINAL VALUE ALSO TO BE SUPPLIED. THE NOMINAL VALUES FOR EACH SHIPPING LOT WILL BE SUPPLIED WITH THE APPLICABLE SHIPMENT.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:

(1) VOLTAGE TO PIN 10: PLUS 10.0 VOLTS WITH RESPECT TO PIN 5.

(2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO PIN 5.

(3) THERMAL RESISTANCE, JUNCTION-CASE. (0_{JC}): 200°C/WATT.

(4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (0_{JA}): 500°C/WATT.

B. TEMPERATURE:

(1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.

(2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C.

(3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX).

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON, NPN.

(2) ENCLOSURE: A HERMETICALLY SEALED PACKAGE ELECTRICALLY ISOLATED FROM POWER OR GROUND, THE DIMENSIONS OF WHICH MEET THE REQUIREMENTS OF FIGURE 1 AND PARAGRAPH 2.E.

(3) LEADS:

LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 WITH THE FOLLOWING EXCEPTIONS:

GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES. THE NICKEL STRIKE UNDER THE GOLD SHALL BE OPTIONAL BUT IF USED SHALL BE A MAXIMUM OF 100 MICRO INCHES, AND PARAGRAPH 3.4.2 SHALL NOT APPLY. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

4. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

A. AVERAGE PROPAGATION DELAY (T_p): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 2 MADE UP OF ACCEPTABLE UNITS WHERE $T_p = (T_1 + T_2)/2$. VOLTAGE 4V ± 10% DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

Ⓓ REPLACES REV(C) WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	H. Wong	27MAY65
CHECKED	A. Marts	6-2-65
APPROVED	C D Hanley	1 Jun 65
APPROVED	Eldon C Hall	2 Jun 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC	W J Rhine	6-2-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321
SCALE NONE		SHEET 2 OF 5

SYM	DESCRIPTION	DATE	APPROVED
D	REDRAWN AND REVISED PER TDRR 19259		
E	REVISED PER TDRR 20877	8/17/65	WR

1006321 E

B. VISUAL AND MECHANICAL EXTERNAL EXAMINATION UNDER 10X AND 80X MAGNIFICATION:

MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTRANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION (A) MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION. NO BODY PAINT SHALL BE ON THE LEADS OR PACKAGE SEAL AREA.

C. PRESEAL VISUAL INSPECTION: THE PRESEAL VISUAL INSPECTION SHALL BE PERFORMED USING THE REJECTION CRITERIA OF ND 1002257 THE DIFFUSION SUBLOT SHALL BE UTILIZED FOR SAMPLING SPECIFIED IN TABLE I. DATA SHALL ACCOMPANY EACH SHIPMENT COVERING THE NUMBER OF SUB-LOTS TESTED, THE NUMBER OF UNITS THAT FAILED FROM EACH SUB-LOT, THE CAUSE OF FAILURE, AND THE NUMBER OF TIMES EACH SUB-LOT WAS RESUBMITTED TO TABLE I TEST.

① MAX BODY DIMENSIONS INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005 OF ℄ OF PIN 1.℄ OF LEADS TO BE MEASURED WITHIN .030 OF PACKAGE BODY.

② SEE PARAGRAPH 2.E.

TABLE I

PRE SEAL VISUAL INSPECTION		
TEST	TEST CONDITIONS	DIFFUSION SUB-LOT
VISUAL INTERNAL INSPECTION	SEE NOTE 2.C.(4) AND 4.C.	LTPD* = 7 MAX ACC NO. = 1

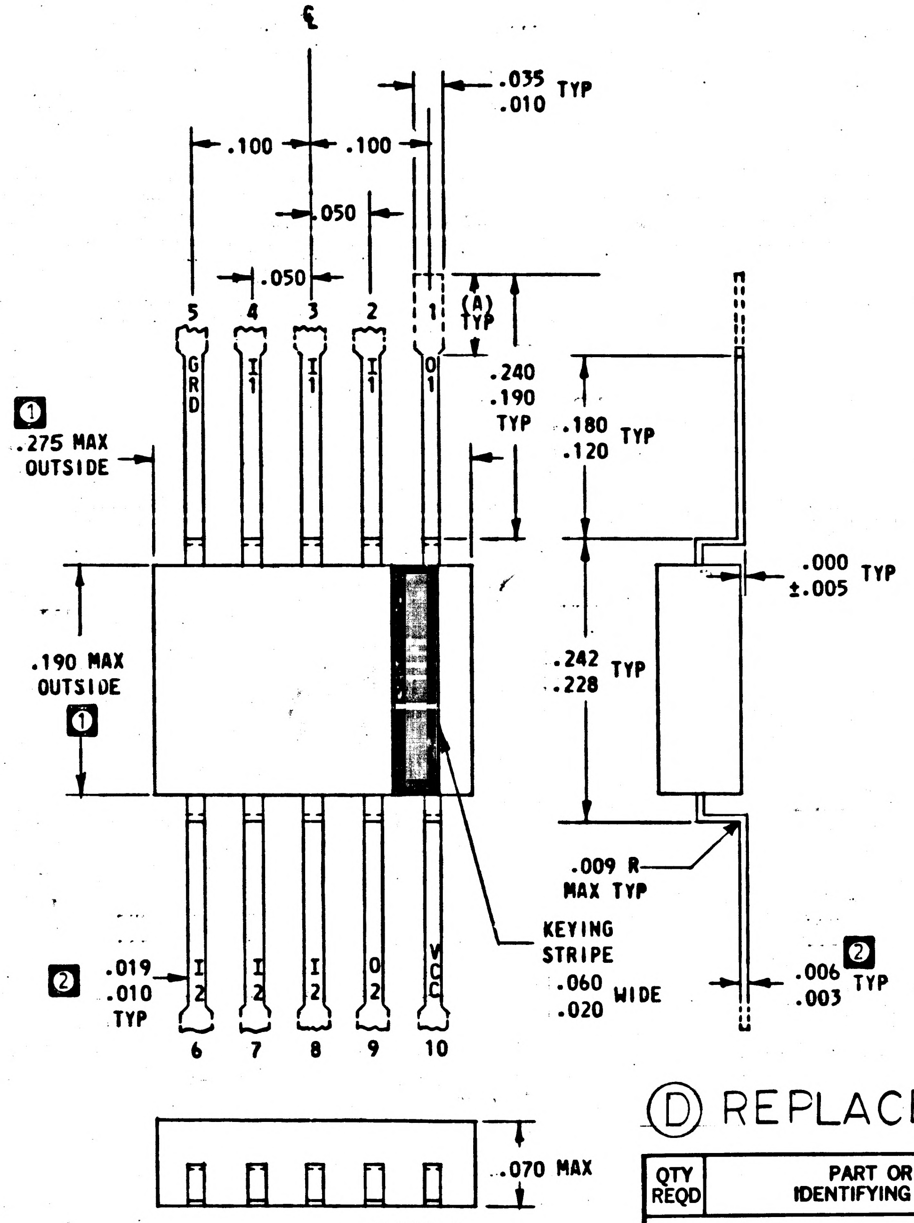

FIGURE 1

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN H. Wong DATE 24MAY65
CHECKED A. Martz 6-2-65
APPROVAL L D Hanley 1Jun65
APPROVAL Eldon C. Hall 2Jun65
APPROVAL
NASA APPROVAL W J Rhine 6-2-65
MIT APPROVAL
MIT APPROVAL 2Jun65

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DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006321
SCALE NONE	WT	SHEET 3 OF 5

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

1006321 E

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REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
D		REDRAWN AND REVISED PER TDRR 19259				
E		REVISED PER TDRR 20877			8/17/65	WK

TABLE II

ACCEPTANCE INSPECTION **

TEST ***	SYMBOL	TEST CONDITIONS *****						LIMITS		UNITS	LOT
								MIN	MAX		
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE PARAGRAPH (4.B)						-	-		*LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2.6	PIN 3.7	PIN 5	PIN 4.8	PIN 1.9	PIN 10				
BASE CURRENT	I_B	+870±2mV	+1800±10mV	0V	+1800±10mV		+4±.01V		152	uA	100% TESTING REQUIRED
BASE CURRENT	I_B	+1800±10mV	+870±2mV	0V	+1800±10mV		+4±.01V		152	uA	
BASE CURRENT	I_B	+1800±10mV	+1800±10mV	0V	+870±2mV		+4±.01V		152	uA	
OUTPUT VOLT PIN 1.9	V_O	+770±2mV	OPEN	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	+770±2mV	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	OPEN	0V	+770±2mV		+4±.01V		300	mV	
SAT VOLT PIN 1.9	V_S	+870±2mV	OPEN	0V	OPEN		+4±.01V		220	mV	
SAT VOLT PIN 1.9	V_S	OPEN	+870±2mV	0V	OPEN		+4±.01V		220	mV	
SAT VOLT PIN 1.9	V_S	OPEN	OPEN	0V	+870±2mV		+4±.01V		220	mV	
OUTPUT CURRENT PIN 1.9	I_O	+500±2mV	+500±2mV	0V	+500±2mV	+870±2mV	+4±.01V	760		uA	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	+500±2mV	+500±2mV	0V	+500±2mV	+1.00±.01V	OPEN		15	uA	
SUBGROUP 3											
COLLECT CUTOFF CURRENT	I_{CEO}	OPEN	OPEN	0V	OPEN	+5±.1V	OPEN		100	uA	*LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
EMITTER CUTOFF CURRENT	I_{EBO}	0V	0V	+4±.1V	0V	OPEN	OPEN		100	uA	
COLLECT CUTOFF CURRENT	I_{CBO}	0V	0V	OPEN	0V	+8±.1V	OPEN		100	uA	
INTERFACE TEST	B_1	870±2mV	OPEN	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_2	OPEN	870±2mV	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_3	OPEN	OPEN	0V	870±2mV	5KΩ TO +10V	OPEN		400	mV	
COLLECTOR EMITTER SUSTAINING VOLTAGE	$V_{CEO\ SUST}$	I_C = 5 mA (PULSED) PINS 1.9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_p	SEE PARAGRAPH (4.A) AND FIGURE 2							24	nsec	*LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 10 AND 1.9 MEASUREMENT CURRENT = 1 mA						2.7	4.15	Kohms	*LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1 mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		*LTPD = 7 MAX. ACC. NO. = 1

* LTPD PER MIL-S-19500C, TABLE IV

** SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV.

*** MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

**** TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR.

***** TEST TO BE PERFORMED IN SEQUENCE INDICATED.

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	W. Wong	27MAY65
CHECKED	A. Marts	6-2-65
APPROVED	L.D. Hanley	1 June 65
APPROVED	Eldon C. Hall	2 June 65
APPROVED MIT	W Kupfer	2 June 65
APPROVED MSC	W J Rhine	6-2-65

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DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

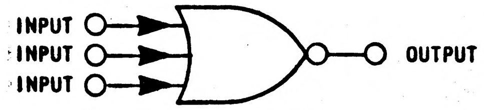
CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321

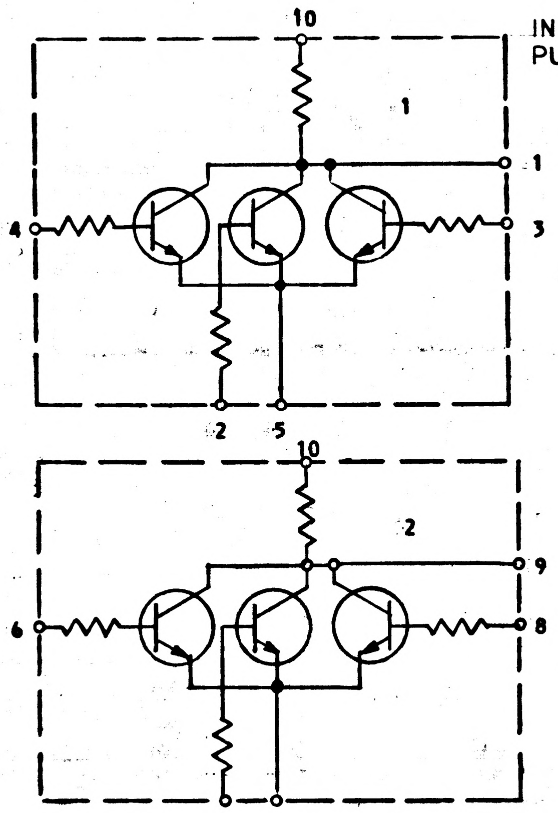
SCALE NONE

1006321 E

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
D	REDRAWN AND REVISED PER TDRR 19259		
E	REVISED PER TDRR 20877	8/17/65	WR

LOGIC SYMBOL


INPUT
INPUT
INPUT
OUTPUT


10
1
1
4
3
2
5
10
2
9
6
8
7
5

SCHEMATIC

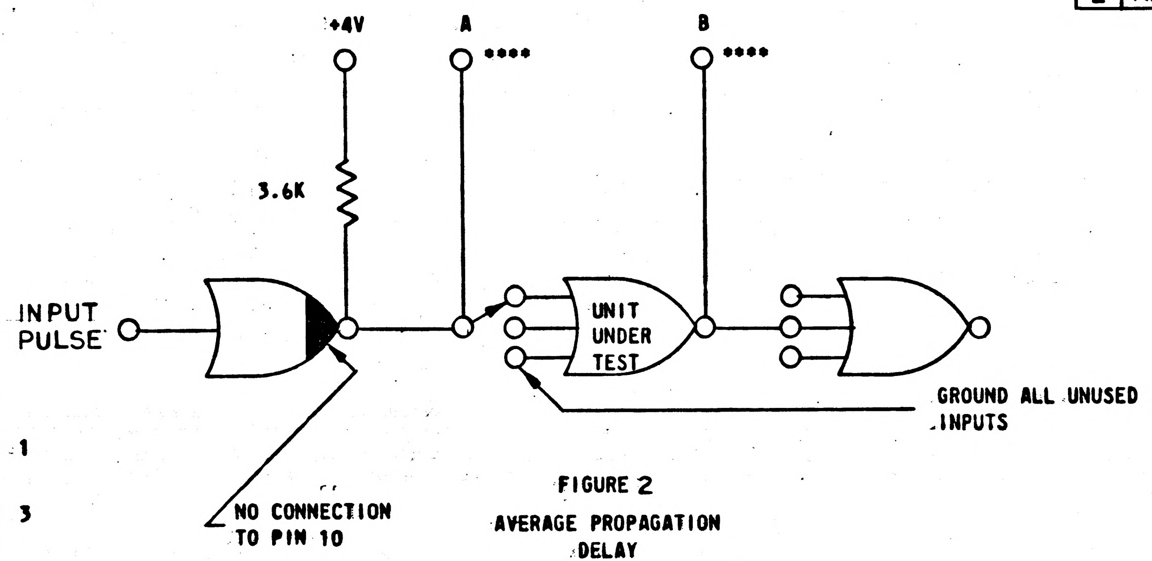
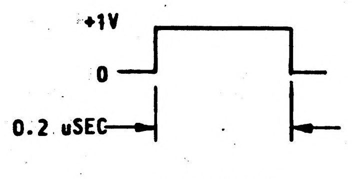
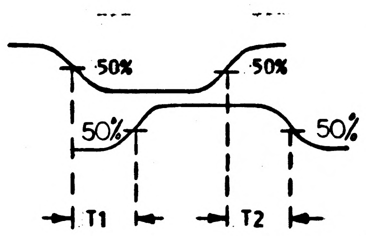

+4V
A ****
B ****
3.6K
INPUT PULSE
UNIT UNDER TEST
GROUND ALL UNUSED INPUTS
NO CONNECTION TO PIN 10

FIGURE 2
AVERAGE PROPAGATION DELAY



INPUT PULSE


50%
50%
50%
50%
T1
T2

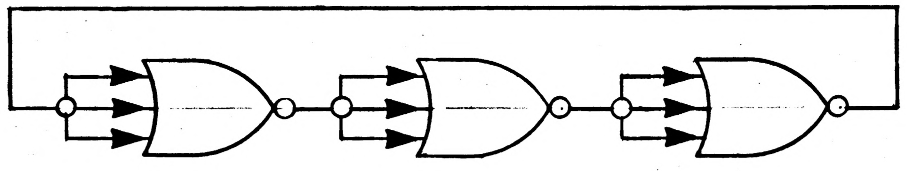


FIGURE 3
TEST CIRCUIT - POWER BURN IN

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± | DECIMALS .XXX ± | ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

NEXT ASSY	USED ON
APPLICATION	

MASTER

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DWG. NO. CONTRACT

DRAWN H-Wong DATE 24 MAY 65
CHECKED A. Martz 6-2-65
APPROVAL E W Hanley 1 Jun 65
APPROVAL Eldon C Hall 2 June 65
APPROVAL
NASA APPROVAL W J Rhine 6-2-65
MIT APPROVAL
MIT APPROVAL

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006321
SCALE NONE	WT	SHEET 5 OF 5

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006321 E

1006321 F

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
D		REDRAWN AND REVISED PER TDRR 19259				
E		REVISED PER TDRR 20877			9/17/65	WK
F		REVISED PER TDRR 27100			3/24/66	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, DIFFUSION SUB-LOT CODE, KEYING STRIPE, "(COLOR OPTIONAL; BLACK OR WHITE)" AND THE NUMBER 321. THE BACK OF THE PACKAGE MAY BE UTILIZED FOR THE DIFFUSION SUB-LOT NUMBER.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

F. THE SHIPMENT LOTS, MADE UP OF UNITS AS SPECIFIED BY THIS DRAWING, MUST MEET THE REQUIREMENTS OF ND 1002248, WHEN PROCESSED AS SPECIFIED IN ND 1002248, PERFORMED AT THE BUYERS PLANT. LOTS OR SUBLOTS REJECTED BY THE CRITERIA OF PARA. 4.3 OF ND 1002248 SHALL BE RETURNED TO THE VENDOR

2. ACCEPTANCE AND INSPECTION: QUALITY DEMONSTRATION PER TABLES I AND II

A. DEFINITIONS:

(1) A SHIPMENT LOT IS DEFINED AS A GROUP OF PARTS ASSEMBLED FROM DIFFUSION SUB-LOTS AND DATE CODES WHICH ARE SHIPPED AT ONE TIME WHICH HAVE BEEN FABRICATED IN A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A CONTROLLED PROCESS. NO PROCESS CHANGES DEFINED AS CRITICAL BY ND 1015404 NEGOTIATION MAY BE CHANGED DURING THE FABRICATION OF A SHIPMENT LOT. MAXIMUM NUMBER OF UNITS SHIPPED IN A LOT SHALL BE 5,000. A MAXIMUM OF 100 DIFFUSION SUB-LOTS MAY BE USED TO ASSEMBLE ONE SHIPMENT LOT. A SHIPMENT LOT MAY INCLUDE MORE THAN ONE DATE CODE LOT.

(2) A DIFFUSION SUB-LOT IS DEFINED AS A GROUP OF PARTS FABRICATED FROM MATERIALS WHICH WERE PROCESSED THROUGH DIFFUSION MASKING, ETCHING AND METALLIZATION AT ONE TIME (A SINGLE BATCH). THIS SUB-LOT IDENTIFICATION MUST BE MAINTAINED THROUGH SUBSEQUENT STAGES OF ASSEMBLY AND TEST. A DIFFUSION SUB-LOT SHALL BE SEALED WITH ONLY ONE DATE CODE.

(3) DATE CODE LOT IS DEFINED AS THOSE UNITS SEALED DURING ONE WEEK.

B. TEST CONDITIONS:

(1) THE TESTS AS DEFINED IN TABLES I & II SHALL BE PERFORMED BY THE QUALITY CONTROL DEPARTMENT OF THE VENDOR.

(2) UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCED TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.

(3) THE PRE-SEAL TEST PER TABLE I SHALL BE PERFORMED AFTER THE FINAL PRODUCTION INTERNAL VISUAL INSPECTION AND PRIOR TO SEALING.

C. VENDOR SUPPLIED INFORMATION: THE FOLLOWING DATA AND INFORMATION IS TO BE SUPPLIED WITH EACH SHIPMENT. ALL INFORMATION SUPPLIED WILL REFERENCE THE UNIT PART NUMBER, APPLICABLE PURCHASE ORDER NUMBER, QUANTITY AND DATE OF SHIPMENT, AND THE APPLICABLE DATE CODES OR DIFFUSION LOT CODES.

(1) A CERTIFICATE OF COMPLIANCE COVERING LEAD MATERIAL REQUIREMENTS OF PARAGRAPH 3.C.(3).

(2) A CERTIFICATE OF COMPLIANCE COVERING THE REQUIREMENTS OF ND 1015404.

(3) THE NOMINAL LEAD DIMENSIONS AS REQUIRED BY PARAGRAPH 2.E.

(4) THE PRESEAL INSPECTION DATA REQUIRED BY PARAGRAPH 4.C.

(5) THE SUBGROUP 1 AND 3 TEST DATA REQUIRED BY TABLE II. A SUMMARY OF TEST RESULTS OF SUBGROUPS 1&3, INCLUDING THE NUMBER OF UNITS TESTED & NUMBER OF FAILURES FOUND, SHALL BE SUBMITTED WITH EACH SHIPMENT LOT.

D. SELECTION OF UNITS FOR TEST:

(1) THE SAMPLE USED FOR TABLE II SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A SHIPMENT LOT.

(2) A SHIPMENT LOT MAY BE RESUBMITTED FOR TABLE II SUBGROUP 1&3, THE REQUIREMENT OF MIL-S-19500C GROUP 1&3 FOR LOT RESUBMITTAL SHALL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	H. Wong	27 MAY 65
CHECKED	A. Marts	6-2-65
APPROVED		1 Jun 65
APPROVED	Eldon C Hall	2 Jun 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC		6-2-65

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DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321

SCALE NONE SHEET 1 OF 5

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
D		~~REDRAWN AND REVISED PER TDRR~~ 79259				
E		REVISED PER TDRR 20877	FaP		8/17/65	WK
F		REVISED PER TDRR 27100			3/22/66	WK

2. E. LEAD DIMENSIONS: THE PARTS SUPPLIED IN ANY SHIPMENT LOT MUST BE UNIFORM WITH RESPECT TO LEAD DIMENSIONS. THE LEAD THICKNESS SHALL BE WITHIN ± 0.0005 INCHES OF A NOMINAL VALUE TO BE SPECIFIED BY THE VENDOR. THE LEAD WIDTH SHALL BE WITHIN ± 0.001 INCHES OF A NOMINAL VALUE ALSO TO BE SUPPLIED. THE NOMINAL VALUES FOR EACH SHIPPING LOT WILL BE SUPPLIED WITH THE APPLICABLE SHIPMENT.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:

(1) VOLTAGE TO PIN 10: PLUS 10.0 VOLTS WITH RESPECT TO PIN 5.

(2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO PIN 5.

(3) THERMAL RESISTANCE, JUNCTION-CASE. (θ_{JC}): 200°C/WATT.

(4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (θ_{JA}): 500°C/WATT.

B. TEMPERATURE:

(1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.

(2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C.

(3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX).

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON, NPN.

(2) ENCLOSURE: A HERMETICALLY SEALED PACKAGE ELECTRICALLY ISOLATED FROM POWER OR GROUND, THE DIMENSIONS OF WHICH MEET THE REQUIREMENTS OF FIGURE 1 AND PARAGRAPH 2.E.

(3) LEADS:

LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 WITH THE FOLLOWING EXCEPTIONS:

GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES. THE NICKEL STRIKE UNDER THE GOLD SHALL BE OPTIONAL BUT IF USED SHALL BE A MAXIMUM OF 100 MICRO INCHES, AND PARAGRAPH 3.4.2 SHALL NOT APPLY. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

4. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

A. AVERAGE PROPAGATION DELAY (T_p): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 2 MADE UP OF ACCEPTABLE UNITS WHERE $T_p = (T_1 + T_2)/2$. VOLTAGE 4V ± 10% DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

Ⓓ REPLACES REV Ⓒ WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

SEE NOTE

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DRAWN	H. Wong	27MAY65
CHECKED	A. Marts	6-2-65
APPROVED	L D Hanley	1 Jun 65
APPROVED	Eldon C Hall	2 Jun 65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC	W J Rhine	6-2-65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006321
SCALE NONE		SHEET 2 OF 5

1006321 F

SYM	DESCRIPTION	DATE	APPROVED
D	REDRAWN AND REVISED PER TDRR 19259		
E	REVISED PER TDRR 20877	8/17/65	WR
F	REVISED PER TDRR 27100	3/22/66	WR

B. VISUAL AND MECHANICAL EXTERNAL EXAMINATION UNDER 10X AND 80X MAGNIFICATION:

MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTRANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION (A) MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION. NO BODY PAINT SHALL BE ON THE LEADS OR PACKAGE SEAL AREA.

C. PRESEAL VISUAL INSPECTION: THE PRESEAL VISUAL INSPECTION SHALL BE PERFORMED USING THE REJECTION CRITERIA OF ND 1002257 THE DIFFUSION SUBLOT SHALL BE UTILIZED FOR SAMPLING SPECIFIED IN TABLE I. DATA SHALL ACCOMPANY EACH SHIPMENT COVERING THE NUMBER OF SUB-LOTS TESTED, THE NUMBER OF UNITS THAT FAILED FROM EACH SUB-LOT, THE CAUSE OF FAILURE, AND THE NUMBER OF TIMES EACH SUB-LOT WAS RESUBMITTED TO TABLE I TEST.

① MAX BODY DIMENSIONS INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005 OF ℄ OF PIN 1. ℄ OF LEADS TO BE MEASURED WITHIN .030 OF PACKAGE BODY.

② SEE PARAGRAPH 2.E.

TABLE I

PRE SEAL VISUAL INSPECTION		
TEST	TEST CONDITIONS	DIFFUSION SUB-LOT
VISUAL INTERNAL INSPECTION	SEE NOTE 2.C.(4) AND 4.C.	LTPD* = 7 MAX ACC NO. = 1

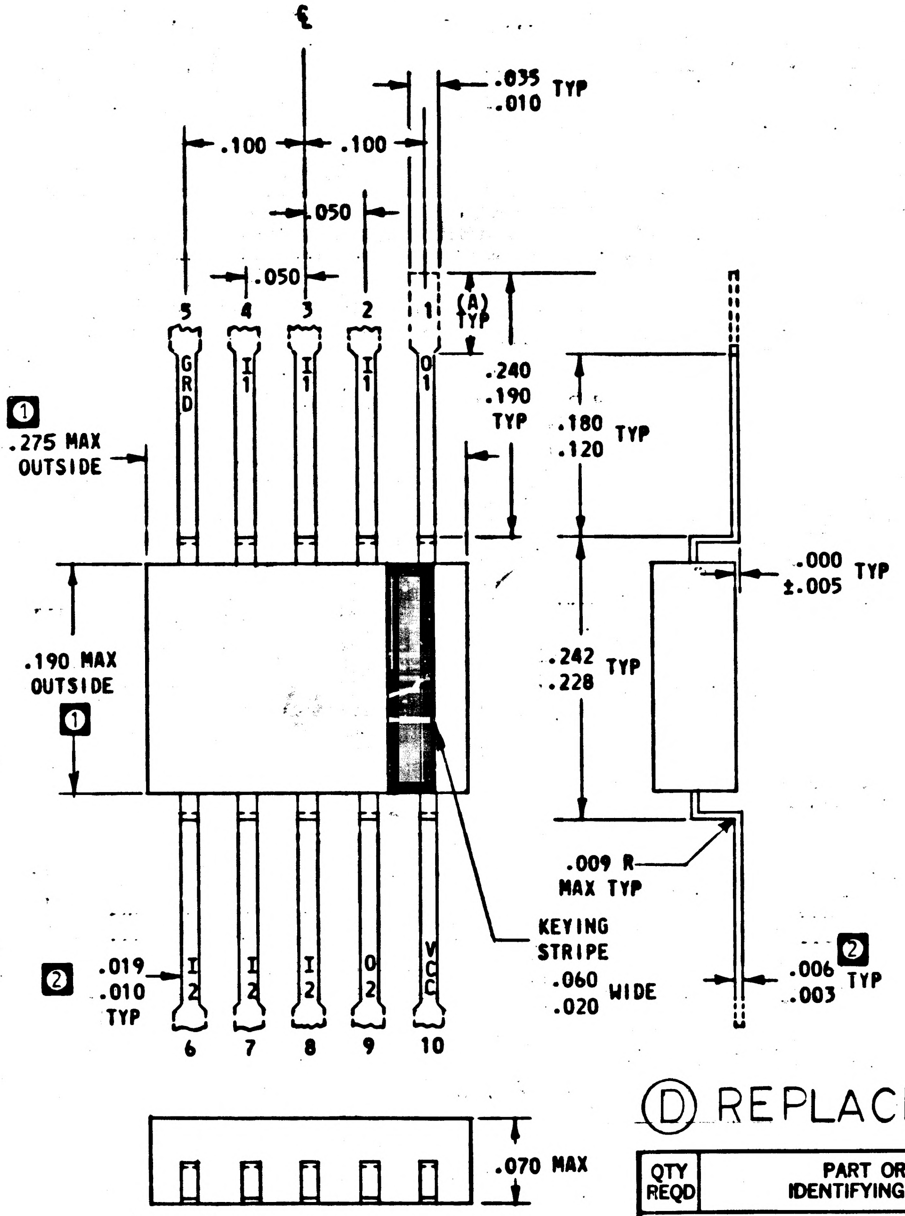

FIGURE 1

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT
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DWG NO.
CONTRACT

DRAWN H. Wong DATE 24MAY65
CHECKED A. Marts 6-2-65
APPROVAL L D Hanley 1 Jun 65
APPROVAL Eldon C Hall 2 Jun 65
APPROVAL
NASA APPROVAL W J Rhine 6-2-65
MIT APPROVAL
MIT APPROVAL 2 Jun 65

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DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006321
SCALE NONE	WT	SHEET 3 OF 5

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006321 F

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1006321 F

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
D		REDRAWN AND REVISED PER TDRR 19259				
E		REVISED PER TDRR 20877			8/17/65	WK
F		REVISED PER TDRR 27100			3/22/66	WK

TABLE II

ACCEPTANCE INSPECTION ••

TEST ***	SYMBOL	TEST CONDITIONS *****						LIMITS		UNITS	LOT
								MIN	MAX		
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE PARAGRAPH (4.B)						-	-		•LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2.6	PIN 3.7	PIN 5	PIN 4.8	PIN 1.9	PIN 10				
BASE CURRENT	I_B	+870±2mV	+1800±10mV	0V	+1800±10mV		+4±.01V		152	uA	100% TESTING REQUIRED
BASE CURRENT	I_B	+1800±10mV	+870±2mV	0V	+1800±10mV		+4±.01V		152	uA	
BASE CURRENT	I_B	+1800±10mV	+1800±10mV	0V	+870±2mV		+4±.01V		152	uA	
OUTPUT VOLT PIN 1.9	V_O	+770±2mV	OPEN	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	+770±2mV	0V	OPEN		+4±.01V		300	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	OPEN	0V	+770±2mV		+4±.01V		300	mV	
SAT VOLT PIN 1.9	V_S	+870±2mV	OPEN	0V	OPEN		+4±.01V		220	mV	
SAT VOLT PIN 1.9	V_S	OPEN	+870±2mV	0V	OPEN		+4±.01V		220	mV	
SAT VOLT PIN 1.9	V_S	OPEN	OPEN	0V	+870±2mV		+4±.01V		220	mV	
OUTPUT CURRENT PIN 1.9	I_O	+500±2mV	+500±2mV	0V	+500±2mV	+870±2mV	+4±.01V	760		uA	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	+500±2mV	+500±2mV	0V	+500±2mV	+1.00±.01V	OPEN		15	uA	
SUBGROUP 3											
COLLECT CUTOFF CURRENT	I_{CEO}	OPEN	OPEN	0V	OPEN	+5±.1V	OPEN		100	uA	•LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
EMITTER CUTOFF CURRENT	I_{EBO}	0V	0V	+4±.1V	0V	OPEN	OPEN		100	uA	
COLLECT CUTOFF CURRENT	I_{CBO}	0V	0V	OPEN	0V	+8±.1V	OPEN		100	uA	
INTERFACE TEST	B_1	870±2mV	OPEN	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_2	OPEN	870±2mV	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_3	OPEN	OPEN	0V	870±2mV	5KΩ TO +10V	OPEN		400	mV	
COLLECTOR EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	I_C = 5 mA (PULSED) PINS 1.9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_p	SEE PARAGRAPH (4.A) AND FIGURE 2							24	nsec	•LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 10 AND 1.9 MEASUREMENT CURRENT = 1 mA						2.7	4.15	Kohms	•LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1 mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		•LTPD = 7 MAX. ACC. NO. = 1

• LTPD PER MIL-S-19500C, TABLE IV

•• SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV.

••• MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

•••• TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR.

••••• TEST TO BE PERFORMED IN SEQUENCE INDICATED.

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

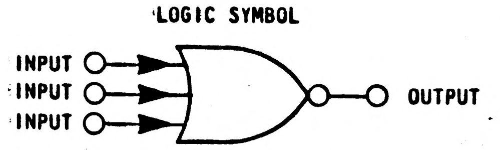
DRAWN	H. Wong	27MAY65
CHECKED	A. Martz	6-2-65
APPROVED	L D Hanley	1 June 65
APPROVED	Eldon C. Hall	2 June 65
APPROVED MIT	W Kupfer	2 June 65
APPROVED MSC	W J Rhine	6-2-65
		DATE

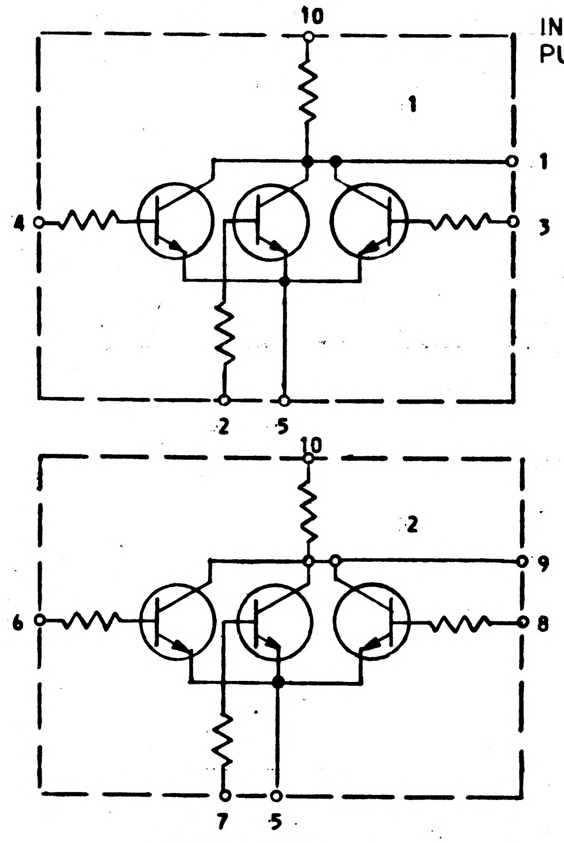
DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006321
SCALE NONE
SHEET 4 OF 5

1006321 F

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
D	REDRAWN AND REVISED PER TDRR 19259		
E	REVISED PER TDRR 20877	8/17/65	WK
F	REVISED PER TDRR 27100	3/22/66	WK


LOGIC SYMBOL
INPUT
INPUT
INPUT
OUTPUT


10
1
1
4
3
2
5
10
2
9
6
8
7
5

SCHEMATIC

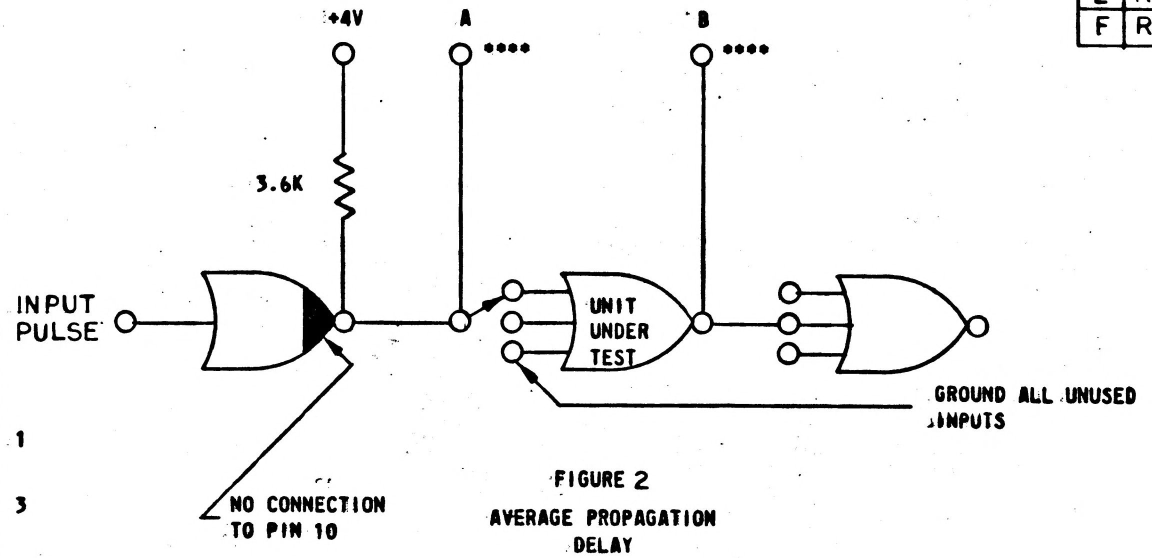
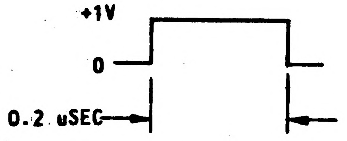
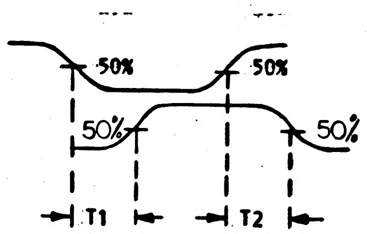

+4V
A ••••
B ••••
3.6K
INPUT PULSE
UNIT UNDER TEST
GROUND ALL UNUSED INPUTS
NO CONNECTION TO PIN 10

FIGURE 2

AVERAGE PROPAGATION DELAY



INPUT PULSE


50%
50%
50%
50%
T1
T2

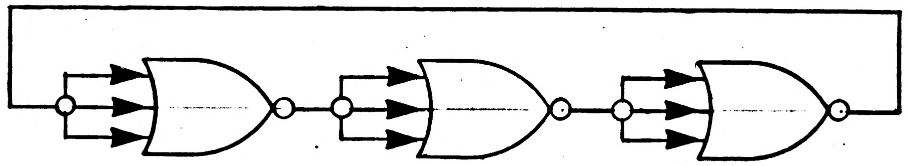


FIGURE 3

TEST CIRCUIT - POWER BURN IN

Ⓓ REPLACES REV(C) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± ; DECIMALS .XXX ± ; ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

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DRAWN H-Wong DATE 24 MAY 65
CHECKED A. McArts 6-2-65
APPROVAL P.W. Hanley 1 Jun 65
APPROVAL Eldon C Hall 2 June 65
APPROVAL
NASA APPROVAL W J Rhine 6-2-65
MIT APPROVAL
MIT APPROVAL W Kupfer 2 June 65

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HOUSTON, TEXAS

DUAL NOR GATE
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006321
SCALE NONE	WT	SHEET 5 OF 5

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

–	1006321

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
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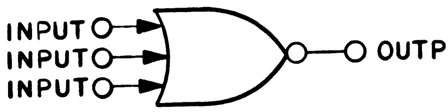
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) VOLTAGE TO PIN 10: PLUS 10.0 VOLTS WITH RESPECT TO PIN 5
     - (2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO GND PIN
     - (3) THERMAL RESISTANCE, JUNCTION-CASE. (θ_{JC}): 200°C/WATT.
     - (4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (θ_{JA}): 500°C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C
     - (3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX.).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND-1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, KEYING STRIPE AND THE NUMBER 321. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER. NO BODY PAINT.

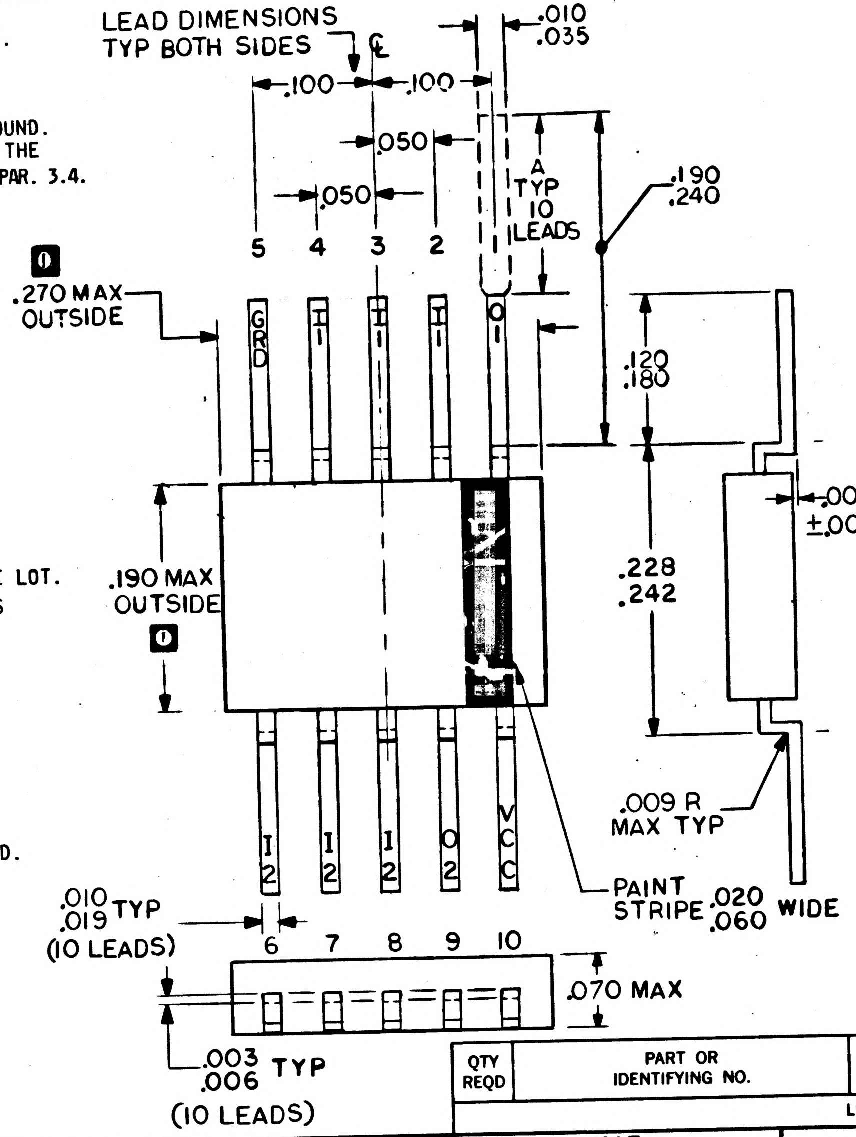
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON. NPN.
   - B. ENCLOSURE: SEE FIGURE, HERMETICALLY SEALED AND ELECTRICALLY ISOLATED FROM POWER OR GROUND.
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT THAT THE GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES THICK. AND EXCEPT PAR. 3.4. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

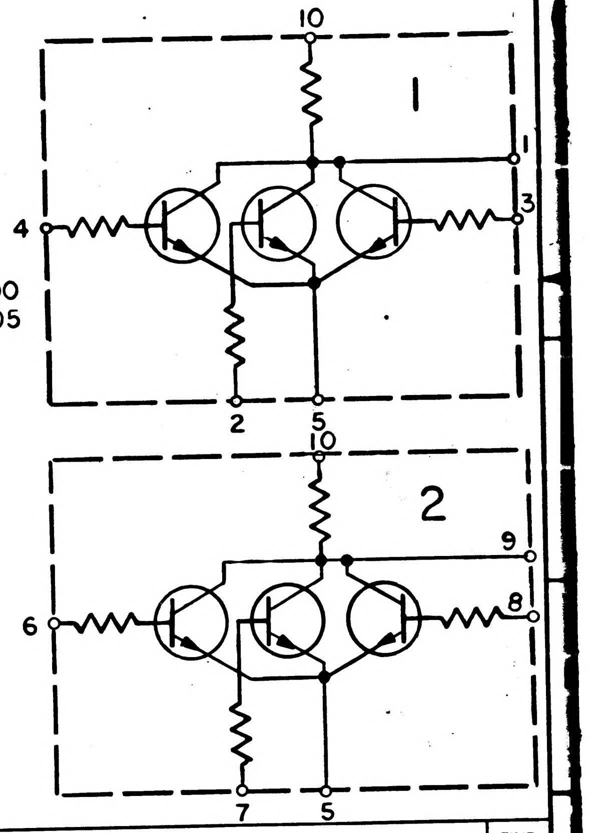
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN. MAXIMUM SHIPPED NUMBER OF UNITS IN ANY LOT SHALL BE 5000 UNITS.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCE TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.
   - C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.
     - (1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE DELETED IN THE SEQUENCE INDICATED.
     - (2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: PURCHASING AGENT
     - (3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.
     - (4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2,3,AND 4 OF TABLE III. IN TABLE III ACCEPTABLE UNITS FROM SUBGROUP 2 MAY BE USED IN SUBGROUP 5.
     - (5) AFTER COMPLETION OF TESTS, UNITS USED ~~IN~~ SUBGROUP 3 OF TABLE III SHALL BE USED IN SUBGROUPS 6 AND 7 OF TABLE III.
     - (6) THE UNITS USED IN THE QUALITY DEMONSTRATION TESTS SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A LOT.
     - (7) A LOT MAY BE RESUBMITTED FOR THE QUALITY DEMONSTRATION TEST ONCE. THE REQUIREMENT OF MIL-S-1900C FOR LOT RESUBMITTAL WILL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.
     - (8) UNITS SHALL BE DATE CODED INDICATING THE WEEK SEALING OPERATION THAT WAS PERFORMED.

LOGIC SYMBOL



① ON SPEC BODY DIMENSIONS MAX INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005





QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
APPLICATION		MATERIAL	DRAWN A. Addazio Jr DATE 23 DEC 64 CHECKED L. D. Hanley APPROVAL L. D. Hanley APPROVAL Ellen C. Hall 28 Dec 64	DUAL NOR GATE (FLAT PACK) SPECIFICATION CONTROL DRAWING	
		HEAT TREATMENT	NASA APPROVAL A. C. Metzger 1/26/65	CODE IDENT NO.	SIZE C NASA DRAWING NO. 1006321
		FINAL FINISH	MIT APPROVAL W Kupfer 26 Jan 65	SCALE NONE	WT SHEET 1 OF 5

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR #5729	1/26/65	WK

NOTES (CONTINUED)

3. D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE: LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A 2 OUNCE WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED. A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 45 DEGREES FROM THE VERTICAL IN ONE DIRECTION, AND BACK 45 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST

(2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 1 POUND MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC. THE UNITS MUST ALSO BE SUBJECTED TO THE GROSS LEAK TEST AS SPECIFIED IN ND1002246. A LEAKAGE RATE OF 5 X 10^{-8} CC/ATM/SEC OR GREATER SHALL CONSTITUTE A FAILURE.

(4) AVERAGE PROPAGATION DELAY (T_P): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 1 MADE UP OF ACCEPTABLE UNITS WHERE $T_P = (T_1 + T_2)/2$. VOLTAGE 4V ± 10%. DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

(5) OPERATION LIFE: AN ODD NUMBER OF UNITS (GATES) SHALL BE CONNECTED IN SERIES WITH THE OUTPUT OF THE LAST UNIT SUPPLYING THE INPUT TO THE FIRST UNIT, THUS FORMING A "RING" AS SHOWN IN FIGURE 2. WITH 8V ± 5% DC APPLIED TO THE POWER TERMINALS OF ALL UNITS IN THE CIRCUIT ("RING") OSCILLATION MUST OCCUR AT THE INITIATION OF THE TEST.

(6) VISUAL AND MECHANICAL EXTERNAL EXAMINATION UNDER 10X AND 80X MAGNIFICATION: MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTERANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION A MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION.

(7) THE UNITS SHALL BE OPENED AND EXAMINED UNDER 10X AND 80X MAGNIFICATION FOR DEFECTS IN THE METALIZED INTERCONNECTION PATTERNS WHICH ARE OR COULD BE DUE TO MECHANICAL ABRASION OR CHEMICAL REACTION WITH CONTAMINATE SUBSTANCES. DEFECTS IN THE METALIZATION WILL BE CAUSE FOR REJECTION. TEST METHOD ND1002239.

(8) EMITTER-BASE BACK BIAS TEST: ALL BASE INPUTS SHALL HAVE MINUS 4 VOLTS WITH RESPECT TO THE COMMON EMITTER CONNECTION. A BETA TEST SHALL BE PERFORMED BEFORE AND AFTER THE EMITTER-BASE BACK BIAS TEST WITH A MAXIMUM TOLERABLE CHANGE IN BETA OF ± 10%.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404. CLASS 2.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
HEAT TREATMENT
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CHECKED L. D. Hanley
APPROVAL L. D. Hanley
APPROVAL Eldon C Hall 28 Dec 64
NASA APPROVAL W J Rhine 12-29-64
MIT APPROVAL W Kupfer 1/26/65

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DUAL NOR GATE
(FLAT PACK)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006321
SCALE
WT
SHEET 2 OF 5

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—	1006321

REVISIONS

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—	INITIAL RELEASE CLASS A PER TDRR 15729	1/26/65	WK

TABLE II

ACCEPTANCE INSPECTION ** ***

TEST	SYMBOL	TEST CONDITIONS						LIMITS		UNITS	LOT
								MIN	MAX		
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE NOTE 3 D (6)						-	-		*LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2,6	PIN 3,7	PIN 5	PIN 4,8	PIN 1,9	PIN 10				
BASE CURRENT BASE CURRENT BASE CURRENT	I_B I_B I_B	+870±2mV +1800±10mV +1800±10mV	+1800±10mV +870±2mV +1800±10mV	0V 0V 0V	+1800±10mV +1800±10mV +870±2mV		+4±.01V +4±.01V +4±.01V		152 152 152	uA uA uA	*LPTD = 1.0 MAX. ACC. NO. 2 (COMBINED)
OUTPUT VOLT. PIN 1,9 OUTPUT VOLT. PIN 1,9 OUTPUT VOLT. PIN 1,9	V_O V_O V_O	+770±2mV OPEN OPEN	OPEN +770±2mV OPEN	0V 0V 0V	OPEN OPEN +770±2mV		+4±.01V +4±.01V +4±.01V		300 300 300	mV mV mV	
SAT. VOLT. PIN 1,9 SAT. VOLT. PIN 1,9 SAT. VOLT. PIN 1,9	V_S V_S V_S	+870±2mV OPEN OPEN	OPEN +870±2mV OPEN	0V 0V 0V	OPEN OPEN +870±2mV		+4±.01V +4±.01V +4±.01V		220 220 220	mV mV mV	*LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
OUTPUT CURRENT PIN 1,9 COLLECTOR-EMITTER THRESHOLD CURRENT	I_O I_{CEX}	+500±2mV +500±2mV	+500±2mV +500±2MV	0V 0V	+500±2mV +500±2mV	+870±2mV +1.00±.01V	+4±.01V OPEN	760	15	uA uA	
COLLECT. CUTOFF CURRENT EMITTER CUTOFF CURRENT COLLECT. CUTOFF CURRENT	I_{CEO} I_{EBO} I_{CBO}	OPEN 0V 0V	OPEN 0V 0V	0V +4±.1V OPEN	OPEN 0V 0V	+5±.1V OPEN +8±.1V	OPEN OPEN OPEN		100 100 100	uA uA uA	
INTERFACE TEST	B_1	870±2mV	OPEN	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_2	OPEN	870±2mV	0V	OPEN	5KΩ TO +10V	OPEN		400	mV	
INTERFACE TEST	B_3	OPEN	OPEN	0V	870±2mV	5KΩ TO +10V	OPEN		400	mV	
COLLECTOR EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST.	I_C = 5mA (PULSED) PINS 1,9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_P	SEE NOTE 3D (4) AND FIGURE 1							24	nsec	*LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 10 AND 1,9 MEASUREMENT CURRENT = 1mA						2.7	4.15	Kohms	*LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		*LTPD = 7 MAX. ACC. NO. = 1

* LTPD PER MIL-S-19500C, TABLE IV

** SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV

*** MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

**** TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR

***** TEST TO BE PERFORMED IN SEQUENCE INDICATED

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LIST OF MATERIALS

NEXT ASSY	USED ON

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
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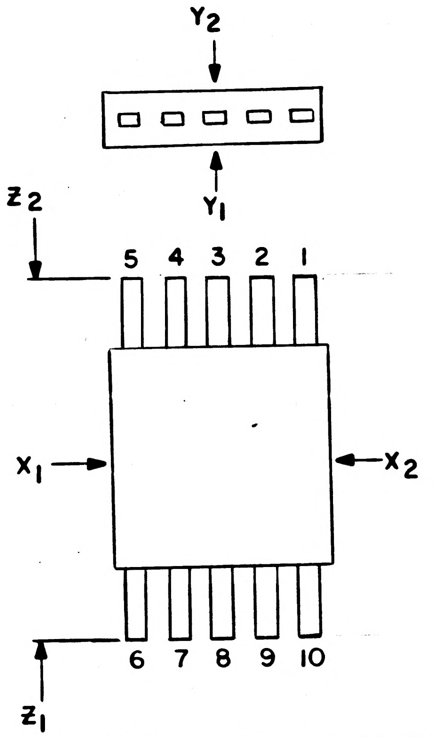
TABLE III

QUALITY DEMONSTRATION TESTS**

TEST	TEST CONDITION	LOT
SUBGROUP 1 PHYSICAL DIMENSION	SEE NOTE 3 C (3) METHOD 2066	LTPD* = 20 MAX.ACC.NO.=1
SUBGROUP 2***** THERMAL SHOCK SEAL TEST	SEE NOTE 3 C (4) METHOD 1056, CONDITION B (150°C TO -65°C, 5 CYCLES) SEE NOTE 3 D (3)	LTPD* = 7 (COMBINED) MAX.ACC.NO.=1
SUBGROUP 3***** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	SEE NOTE 3 C (4) METHOD 1031 tstg = 150 ± 5°C, 1000 HOURS METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN ALL AXIS DIRECTIONS 30 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM METHOD 2006, (20,000 G) Y1 & Y2 AXIS ONLY	LTPD* = 5 (COMBINED) MAX.ACC.NO.= 1
SUBGROUP 4 OPERATION LIFE	SEE NOTE 3 C (4) METHOD 1026 SEE NOTE 3 D (5) AND FIGURE 2 T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS	λ* = 3 MAX.ACC.NO.=0
SUBGROUP 5***** LEAD TENSION LEAD FATIGUE	SEE NOTE 3 C (3) SEE NOTE 3 D (2) SEE NOTE 3 D (1)	LTPD* = 20 (COMBINED) MAX.ACC.NO.=1
SUBGROUP 6***** VISUAL INTERNAL INSPECTION	SEE NOTE 3 C (5) AND NOTE 3 D (7)	LTPD* = 15 MAX.ACC.NO=1
SUBGROUP 7***** EMITTER-BASE BACK BIAS	SEE NOTE 3 D (8) AND NOTE 3 C (5) t = 72 HOURS T_A = 100 ± 5°C	LTPD* = 10 MAX.ACC.NO=1



VIEW SHOWN FOR AXIS REFERENCE ONLY

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITIONS	LIMIT MIN	LIMIT MAX	UNITS
END POINTS FOR SUBGROUPS 2,3, AND 4		SAME AS SPECIFIED IN TABLE II			
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT VOLTAGE, PIN 1,9	V_0		-	300	mV
OUTPUT CURRENT, PIN 1,9	I_0		.760	-	mA
COLLECTOR EMITTER THRESHOLD CURRENT	I_{CEX}		-	20	uA
BASE CURRENT, I 2,6	I_B		-	152	uA
BASE CURRENT, I 3,7	I_B		-	152	uA
BASE CURRENT, I 4,8	I_B		-	152	uA

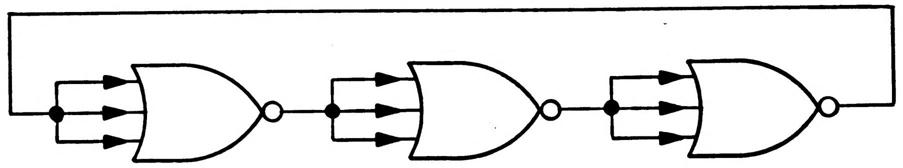


FIGURE 2
TEST CIRCUIT - POWER BURN IN

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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HEAT TREATMENT
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NASA DRAWING NO. 1006321
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WT ——
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4 3 2 1

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SYM	DESCRIPTION	DATE	APPROVAL
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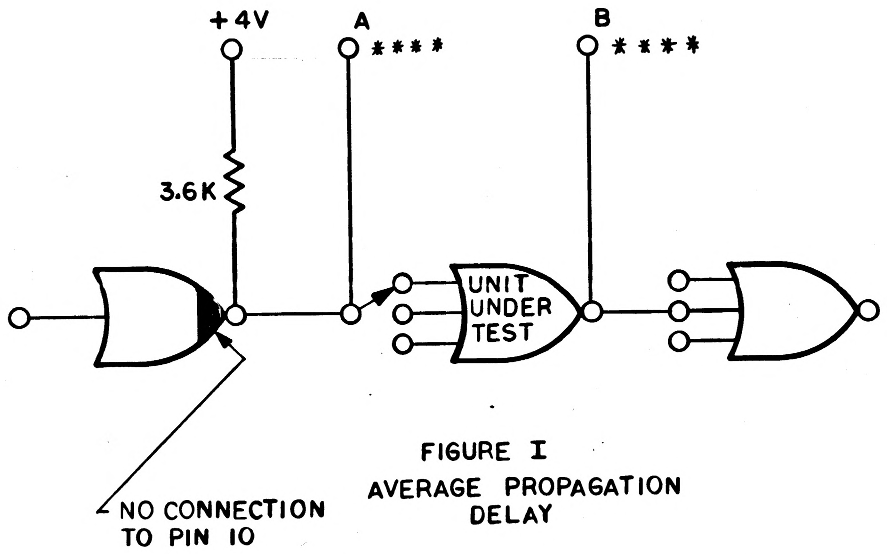
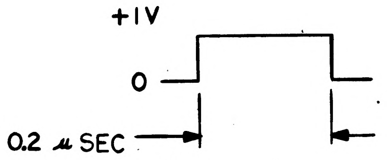
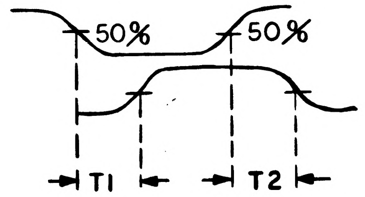


FIGURE I
AVERAGE PROPAGATION DELAY





QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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SPECIFICATION CONTROL DRAWING

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———	C	1006321
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4 3 2 1

1006322

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SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 16045	2-2-65	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THIS MATERIAL SHALL MEET THE GENERAL REQUIREMENTS OF MIL-I-23053 , CLASS 6 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I.

      (1) SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

      (2) UNIT PACKAGES SHALL BE CONSIDERED SPOOLS AND ADEQUATE BOXES FOR COILS AND FOLDED LENGTHS.

2. ACCEPTANCE AND INSPECTION (TESTS TO BE PERFORMED ON DIMENSIONALLY RECOVERED SAMPLES UNLESS OTHERWISE SPECIFIED):

   A. MECHANICAL PROPERTIES:

      (1) COLOR: IN ACCORDANCE WITH CLASS I OF MIL-STD-104 AS SPECIFIED IN TABLE I HEREIN.

      (2) APPEARANCE: IN ACCORDANCE WITH MIL-I-23053 .

      (3) DIMENSIONS: IN ACCORDANCE WITH TABLE I HEREIN.

   B. ELECTRICAL CHARACTERISTICS:

      (1) DIELECTRIC WITHSTANDING VOLTAGE: IN ACCORDANCE WITH MIL-I-23053 (500 VRMS/MIL MINIMUM).

      (2) DISSIPATION FACTOR: 0.0003 MAXIMUM WHEN TESTED UP TO 1.0 MEGACYCLE IN ACCORDANCE WITH FED-STD-406, METHOD 4031.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH THE APPLICABLE REQUIREMENTS OF MIL-I-23053 , CLASS 6 WITH THE EXCEPTION OF A MATERIAL MODIFICATION, AS-RECEIVED DIMENSIONAL DIFFERENCES, AND HEAT RESISTANT TEMPERATURE DIFFERENCE, ALL OF WHICH SHOULD BE CERTIFIED TO THIS DRAWING.

3. DESIGN:

   A. MATERIAL: COPOLYMER OF TETRAFLUOROETHYLENE AND HEXAFLUOROPROPYLENE WHICH HAS BEEN STRETCHED.

      THIS SLEEVING SHALL MEET THE REQUIREMENTS OF MIL-I-23053 EXCEPT FOR SHRINK (RECOVERY) TEMPERATURE, HEAT RESISTANCE, AND AS-RECEIVED DIMENSIONS.

      UPON APPLICATION OF HEAT (SEE TABLE II), THE SLEEVING SHOULD RECOVER ITS ORIGINAL DIMENSIONS AS LISTED IN TABLE I.

      WHEN TESTING DIMENSIONAL RECOVERY (PARAGRAPH 4.5.24 OF MIL-I-23053) USE 200° ± 5°C (392° ± 9°F) FOR 5 MINUTES.

      WHEN TESTING HEAT RESISTANCE (PARAGRAPH 4.5.3.10 OF MIL-I-23053) USE 232°C FOR 96 HOURS.

   B. TEMPERATURE-RECOVERY-TIME CHARACTERISTIC: SLEEVING SHALL RECOVER A KNOWN PERCENTAGE OF THE DIFFERENCE BETWEEN THE AS-RECEIVED SIZE AND RECOVERED SIZE WHEN A KNOWN TEMPERATURE IS APPLIED FOR A PERIOD OF TIME SUFFICIENT TO BRING THE WHOLE MASS (PART BEING COVERED + SLEEVING) UP TO THAT TEMPERATURE. NORMALLY, 5-15 SECONDS IS ALL THAT IS REQUIRED TO ACCOMPLISH WHATEVER AMOUNT OF RECOVERY WILL OCCUR AT THAT TEMPERATURE. FURTHER TIME APPLICATION WILL NOT SHRINK THE SLEEVING FURTHER FOR A GIVEN TEMPERATURE. THEREFORE PERCENT RECOVERY IS A FUNCTION OF TEMPERATURE AND APPROXIMATE VALUES ARE SHOWN IN TABLE II.

MHD1CH

PROCURE ONLY FROM APPROVED SOURCES

TABLE I - DASH NO. VS COLOR VS SIZE

DASH NO. VS COLOR						SIZE (INCHES)				
						NOMINAL SIZE AWG/ DIA.	EXPANDED INSIDE DIAMETER MINIMUM	RECOVERED DIMENSIONS(TYP)		
CLEAR	BLK	WHT	RED	YEL	BLU			INSIDE DIA. MAXIMUM	WALL THICK-NESS	WALL THICKNESS TOLERANCE
-001	-026	-051	-076	-101	-126	NO. 24	.031	.027	.008	±.002
-002	-027	-052	-077	-102	-127	NO. 22	.036	.032	.008	↑
-003	-028	-053	-078	-103	-128	NO. 20	.045	.039	.008	
-004	-029	-054	-079	-104	-129	NO. 18	.060	.049	.008	
-005	-030	-055	-080	-105	-130	NO. 16	.075	.061	.009	
-006	-031	-056	-081	-106	-131	NO. 14	.092	.072	.009	↓
-007	-032	-057	-082	-107	-132	NO. 12	.115	.089	.009	±.002
-008	-033	-058	-083	-108	-133	NO. 10	.141	.114	.010	±.003
-009	-034	-059	-084	-109	-134	NO. 9	.158	.124	.010	±.003
-010	-035	-060	-085	-110	-135	NO. 8	.180	.143	.010	±.003
-011	-036	-061	-086	-111	-136	NO. 7	.197	.158	.011	±.004
-012	-037	-062	-087	-112	-137	NO. 6	.225	.180	.011	±.004
-013	-038	-063	-088	-113	-138	NO. 5	.248	.198	.011	±.004
-014	-039	-064	-089	-114	-139	NO. 4	.290	.226	.011	↑
-015	-040	-065	-090	-115	-140	NO. 3	.310	.249	.011	
-016	-041	-066	-091	-116	-141	NO. 2	.365	.280	.012	
-017	-042	-067	-092	-117	-142	NO. 1	.400	.311	.012	
-018	-043	-068	-093	-118	-143	NO. 0	.440	.349	.012	
-019	-044	-069	-094	-119	-144	3/8	.500	.383	.015	
-020	-045	-070	-095	-120	-145	7/16	.580	.448	.020	
-021	-046	-071	-096	-121	-146	1/2	.666	.510	.020	
-022	-047	-072	-097	-122	-147	5/8	.830	.637	.025	
-023	-048	-073	-098	-123	-148	3/4	1.000	.764	.030	
-024	-049	-074	-099	-124	-149	7/8	1.170	.891	.035	↓
-025	-050	-075	-100	-125	-150	1"	1.330	1.020	.035	±.004

TABLE II

TEMPERATURE	% RECOVERY
BELOW 250°F	VERY LITTLE
250°F	50%
300°F	80%
350°F	100%
ABOVE 350°F	NO FURTHER SHRINKING

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS			

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DWG. NO.
CONTRACT
DRAWN C. Hayward DATE 11 JAN 65
CHECKED A. Caggiano 11 Jan 65
APPROVAL
APPROVAL Eldon C Hall 29 Jan 65
NASA APPROVAL 2/2/65
MIT APPROVAL

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HOUSTON, TEXAS

INSULATION SLEEVING,
ELECTRICAL, HEAT-SHRINKABLE
(TEFLON-FEP)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006322
SCALE NONE
WT
SHEET 1 OF 1

1006323 A

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
REVISIONS						
-		INITIAL RELEASE CLASS A PER TDRR 17476			18 Mar 65	WK
A		REVISED PER TDRR 20619			6/17/65	WK

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REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

   E. MARKING:

   (1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6323). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

   F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

   (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

   (1) DIMENSIONS: AS DELINEATED HEREIN.

   B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL. A LEAKAGE RATE OF 1 X 10^{-8} CC-ATM-SEC OR GREATER SHALL CONSTITUTE A FAILURE.

   C. ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

   (1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

   (2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

   COLLECTOR CUTOFF CURRENT
   COLLECTOR-BASE BREAKDOWN VOLTAGE
   EMITTER-BASE BREAKDOWN VOLTAGE
   EMITTER-BASE REVERSE CURRENT
   COLLECTOR-EMITTER SUSTAINING VOLTAGE
   COLLECTOR-EMITTER CURRENT
   COLLECTOR-EMITTER THRESHOLD CURRENT
   DIRECT CURRENT GAIN
   BASE-EMITTER SATURATION VOLTAGE
   COLLECTOR-EMITTER SATURATION VOLTAGE
   COLLECTOR CAPACITANCE
   TURN-ON AND TURN-OFF TIME

   (3) QUALITY DEMONSTRATION TESTING:

   PER TABLE III ON LOTS MORE THAN 500 UNITS USING ACCEPTABLE UNITS FROM SUBGROUP 2 OF TABLE II FOR SUBGROUP 2,3, & 4 OF TABLE III. SUBGROUPS 1 & 5 MAY USE ELECTRICAL REJECTS FROM THE SAME LOT.

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   (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

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3. DESIGN:

   A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150°C.

   B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

   (1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 40 VDC
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   (3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC
   (4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES
   (5) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 50°C/WATT
   (6) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 350°C/WATT
   (7) TEMP. RANGE, JUNCTION, OPERATING: -65°C TO +150°C
   (8) TEMP. RANGE, STORAGE: -65°C TO +150°C

   C. CONSTRUCTION:

   (1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL NPN

   (2) CASE: METAL CASE AND METAL HEADER HERMETICALLY SEALED (JEDEC TO -18)

   (3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

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   D. QUALITY ASSURANCE REQUIREMENTS:

   (1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

   (2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN		10 Feb 65
CHECKED		10 Feb 65
APPROVED		
APPROVED	Ellen C Hall	18 Mar 65
APPROVED MIT	W Kupfer	18 Mar 65
APPROVED MSC		3/1/65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006323

SCALE
SHEET 1 OF 4

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006323 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 17476	19Mar65	WK
A	REVISED PER TDRR 20619	8/17/65	WK

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	MIL-STD-750 TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK *	METHOD 1056, CONDITION B (+150°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE * (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, Tstg = 150 ● ± 5°C, 72 $^{+8}_{-4}$ HOURS		
CONSTANT ACCELERATION *	METHOD 2006 (20,000 G) Y AXIS		
POWER, BURN-IN *	METHOD 1026 P = 350 MILLIWATTS V_{CE} = +20.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS		
SEAL TEST *	SEE NOTE 2.B		

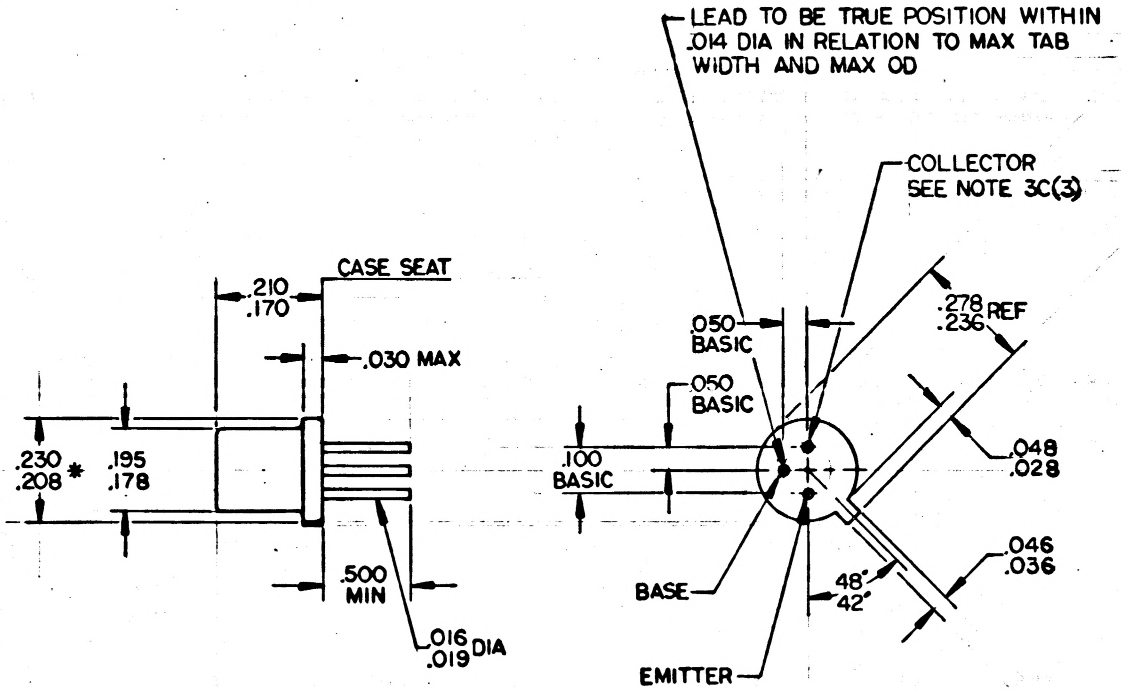
*TEST TO BE PERFORMED IN ORDER INDICATED

**PULSE ≤ 300u SECS AT ≤ 2% DUTY CYCLE.

***LTPD OR λ PER MIL-S-19500D, TABLE CI OR CII

****THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 10 NANOAMPERES MAY BE CONSIDERED TO BE 10 NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

● CURRENTS TO WITHIN ±10%



MASTER

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LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE
CHECKED 8 FEB 65
APPROVAL
APPROVAL Eldon C Hall 18 Mar 65
NASA APPROVAL
MIT APPROVAL 18 Mar 65
MIT APPROVAL

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HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006323
SCALE NONE
WT
SHEET 2 OF 4

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006323 | A

REVISIONS					
SYM	DESCRIPTION	DR	CHK	DATE	APPROVED
-	INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WR
A	REVISED PER TDRR 20619			8/17/65	WR

TABLE II

ACCEPTANCE INSPECTION							
TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS $T_A = 25° \pm 3°C$ UNLESS SPECIFIED	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1							
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071				LTPD*= 10 MAX ACC NO.= 3	LTPD*= 10 MAX ACC NO. = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = 30$ V; $I_E = 0$		100	~~uA~~ NA	100%	LTPD** = 2 (COMBINED) MAX ACC NO.= 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	$V_{CB} = 30$ V; $I_E = 0$, $T_A = +150°C$		200	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C = 100$ uA; $I_E = 0$	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	$V_{EB} = 3$ V; $I_C = 0$		100	~~nA~~		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E = 100$ uA; $I_C = 0$	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE*	$V_{CEO\,SUST}$	$I_C =$ 30 mA PULSED $I_B = 0$	30		V		
COLLECTOR-EMITTER BREAKDOWN	V_{CEO}	$I_C = 1$ma: $I_B = 0$	40		V		
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	$V_{CE} = 30$ V: $R_{BE} = 100$ K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	$V_{BE} = +0.4V$: $V_{CE} = 30V$		10	uA		
DC CURRENT GAIN **	h_{FE}	$I_C = +500$ mA; $V_{CE} = +10$ V	25				
DC CURRENT GAIN **	h_{FE}	$I_C = +150$ mA; $V_{CE} = +10$ V	40	120			
DC CURRENT GAIN **	h_{FE}	$I_C = +10$ mA; $V_{CE} = +10$ V	30				
BASE-EMITTER SATURATION VOLTAGE **	$V_{BE\,SAT}$	$I_C = 500$ mA; $I_B = 50$ mA	1.10	1.30	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE(sat)}$	$I_C = 150$ mA; $I_B = 15$ mA		0.40	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE(sat)}$	$I_C = 500$ mA; $I_B = 50$ mA		1.0	V		
COLLECTOR CAPACITANCE	C_{obo}	$V_{CB} = -10$ V; $I_E = 0$; F = 0.14 mc		8	PF	LTPD***=5 MAX ACC NO =0	LTPD***=5 MAX ACC NO =0
TURN ON TIME	t_{on}	$I_{B1} = I_{B2} \approx 15$ mA; $I_C \approx 150$ mA $t_w > 400$ nsec 2% DUTY CYCLE		35	NSEC		
TURN OFF TIME	t_{off}	$I_{B1} = I_{B2} \approx 15$ mA; $I_C \approx 150$ mA $t_w > 400$ nsec 2% DUTY CYCLE		40	NSEC		

* LTPD PER MIL-S-19500, TABLE II OR III

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
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± ± ±
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LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN DMS 9FEB65
CHECKED 10Feb65
APPROVED
APPROVED Eldon C Hall 18Mar65
APPROVED MIT W Kupfer 18Mar65
APPROVED MSC 3/18/65
DATE

TRANSISTOR, SILICON, TYPE NPN, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006323
SCALE
SHEET 3 OF 4

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WH
A		REVISED PER TDRR 20619			8/12/65	WH

TABLE III

TEST	QUALITY DEMONSTRATION TESTS MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD*** = 20 MAX ACC NO. = 1
SUBGROUP 2*· THERMAL SHOCK SEAL TEST	METHOD 1056.1 (+150 °C TO −65°C, 5 CYCLES) SEE NOTE 2.B		LTPD*** = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3*· STORAGE LIFE	METHOD 1031.1 Tstg = 150° ± 5°C, 1000 HOURS		LTPD*** = 10 (COMBINED) MAX ACC NO.= 3
SHOCK	METHOD 2016.1 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL		
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM.		
CONSTANT ACCELERATION	METHOD 2006, 20,000 G Y AXIS		
SUBGROUP 4 OPERATION LIFE	METHOD 1026.1 P = 350 MILLIWATTS V_{CE} = +20 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		*** = 10 MAX ACC NO.= 3
SUBGROUP 5*· LEAD TENSION (COND. A) LEAD FATIGUE (COND. E)	METHOD 2036.1 4 POUNDS LOAD FOR 10 SECONDS 3 ARCS		LTPD*** = 20 (COMBINED) MAX ACC NO.= 3

* PER MIL-S-19500 TABLE [illegible]

** TESTS TO BE PERFORMED IN ORDER INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB}=+30 V, I_E = 0	±50% ****
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB}=+3 V, I_C = 0	±50%****
DC CURRENT GAIN	hFE	V_{CE} = +10 V, I_C =150 mA	±10%****
END POINTS FOR SUBGROUPS 3 & 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = +30 V, I_E = 0	±100%****
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COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} =+40 V, I_E = 0	±100% *
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MASTER

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NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN		9FEB65
CHECKED	A. Caggiano	10Feb65
APPROVED		
APPROVED	Eldon C Hall	18 Mar 65
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APPROVED MSC		3/12/65
		DATE

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HOUSTON, TEXAS

TRANSISTOR, SILICON
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006323
SCALE		SHEET 4 OF 4

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 17476			10 Mar 65	WK
A		REVISED PER TDRR 20619			6/17/65	WK
B		REVISED PER TDRR 24263			11/30/65	WK

REQUIREMENTS:

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(8) TEMP. RANGE, STORAGE: -65°C TO +150°C

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(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
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CAMBRIDGE, MASS.

		DATE
DRAWN		10 Feb 65
CHECKED		10 Feb 65
APPROVED		
APPROVED	Eldon C Hall	19 Mar 65
APPROVED MIT		10 Mar 65
APPROVED MSC		3/11/65

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CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006323
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 17476	15 Mar 65	WK
A	REVISED PER TDRR 20619	8/17/65	WK
B	REVISED PER TDRR 24263	11/30/65	WK

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	MIL-STD-750 TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK *	METHOD 1056, CONDITION B (+150°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE * (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, Tstg = 150° ± 5°C, $72 {}^{+8}_{-4}$ HOURS		
CONSTANT ACCELERATION *	METHOD 2006 (20,000 G) Y AXIS		
POWER, BURN-IN *	METHOD 1026 P = 350 MILLIWATTS V_{CE} = +20.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168 {}^{+12}_{-6}$ HOURS		
SEAL TEST *	SEE NOTE 2.B		

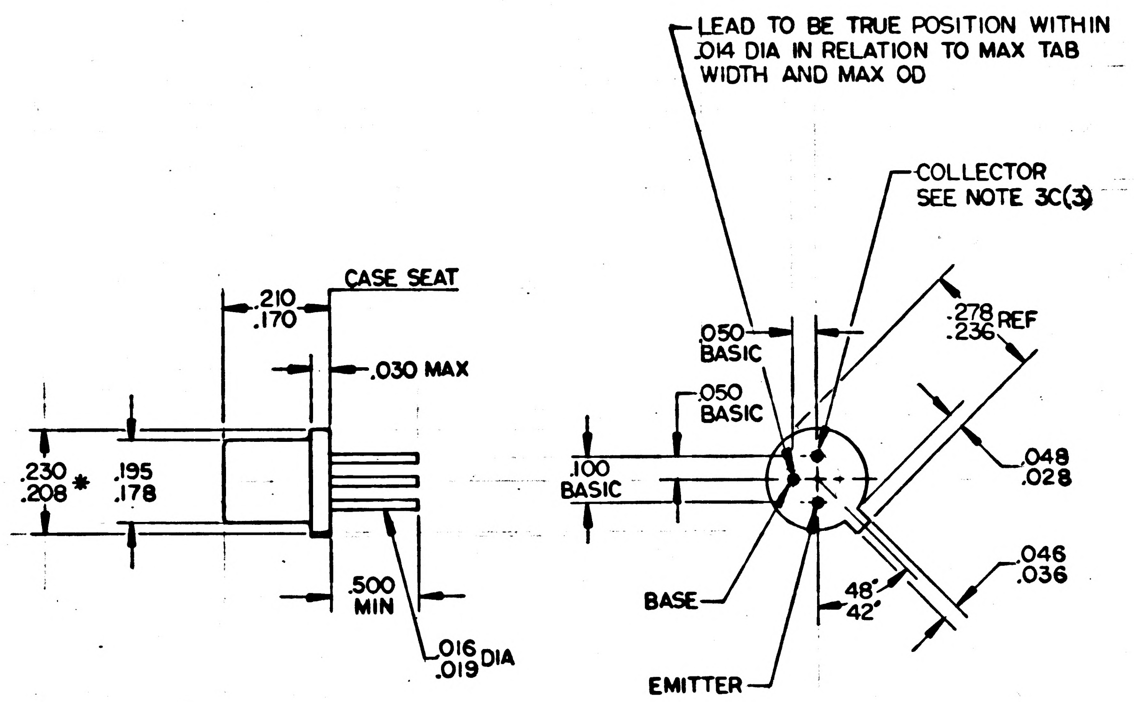
*TEST TO BE PERFORMED IN ORDER INDICATED

**PULSE ≤ 300u SECS AT ≤ 2% DUTY CYCLE.

***LTPD OR λ PER MIL-S-19500D, TABLE CI OR CII

****THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 10 NANOAMPERES MAY BE CONSIDERED TO BE 10 NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

● CURRENTS TO WITHIN ±10%



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FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

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APPROVAL Eldon C Hall 18 Mar 65
NASA APPROVAL
MIT APPROVAL 18 Mar 65
MIT APPROVAL

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SPECIFICATION CONTROL DRAWING

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NASA DRAWING NO. 1006323
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REVISIONS

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-	INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WR
A	REVISED PER TDRR 20619			8/17/65	WR
B	REVISED PER TDRR 24263			11/30/65	WR

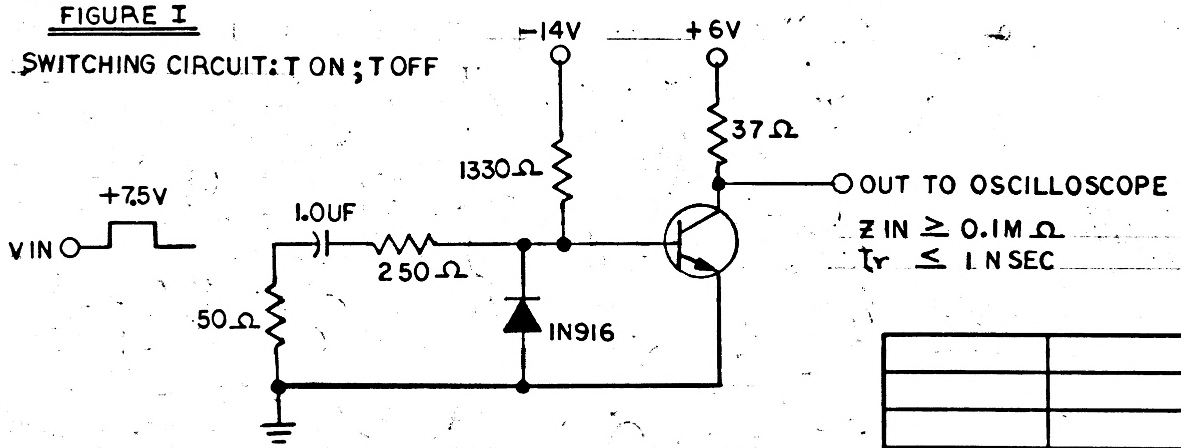
TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS $T_A = 25° \pm 3°C$ UNLESS SPECIFIED	LIMIT MIN	LIMIT MAX	UNITS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071				LTPD*** = 10 MAX ACC NO. = 3	LTPD*** = 10 MAX ACC NO. = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 30 V; I_E = 0		50	nA	100%	LTPD** = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} = 30 V; I_E = 0, T_A = +150°C		200	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = 100uA; I_E = 0	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = 3 V; I_C = 0		100	nA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = 100uA; I_C = 0	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE**	V_{CEO} SUST	I_C = 30mA PULSED I_B = 0	35		V		
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE} = 30 V: R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE} = +0.4V: V_{CE} = 40V		10	uA		
DC CURRENT GAIN **	h_{FE}	I_C = +500 mA; V_{CE} = +10 V	25				
DC CURRENT GAIN **	h_{FE}	I_C = +150 mA; V_{CE} = +10 V	40	120			
DC CURRENT GAIN **	h_{FE}	I_C = +10 mA; V_{CE} = +10 V	30				
BASE-EMITTER SATURATION VOLTAGE **	V_{BE} SAT	I_C = 500 mA; I_B = 50 mA	1.10	1.30	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE(sat)}$	I_C = 150 mA; I_B = 15 mA		0.40	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE(sat)}$	I_C = 500 mA; I_B = 50 mA		1.0	V		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = -10 V; I_E = 0; F = 0.14 mc		8	PF	LTPD***=5 MAX ACC NO =0	LTPD***=5 MAX ACC NO =0
TURN ON TIME } TEST IN CIRCUIT OF FIGURE I	t_{on}	I_{B1} ≈ 15 mA; I_C ≈ 150 mA t_w > 400 nsec 2% DUTY CYCLE		35	NSEC		
TURN OFF TIME	t_{off}	I_{B1} = I_{B2} ≈ 15 mA; I_C ≈ 150 mA t_w > 400 nsec 2% DUTY CYCLE		40	NSEC		

FIGURE I

SWITCHING CIRCUIT: T ON ; T OFF



VOLTAGE IN: VIN = +7.5V

PULSE WIDTH: PW = 0.5USEC

TOTAL RISE, FALL: Tr + Tf ≤ 6NSEC

IMPEDANCE IN: Z IN = 50 Ω

MASTER

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MATERIAL

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CAMBRIDGE, MASS.

DRAWN PMS 9FEB65
CHECKED 10Feb65
APPROVED
APPROVED Eldon C Hall 18Mar65
APPROVED MIT 18Mar65
APPROVED MSC 3/18/65
DATE

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TRANSISTOR, SILICON,
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
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DRAWING NO. 1006323
SCALE
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1006323 B

REVISIONS						
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-		INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WH
A		REVISED PER TDRR 20619			8/17/65	WH
B		REVISED PER TDRR 24263			11/30/65	WH

TABLE III

	QUALITY DEMONSTRATION TESTS		
TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	 OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD*** = 20 MAX ACC NO. = 1
SUBGROUP 2* THERMAL SHOCK SEAL TEST	METHOD 1056.1 (+150 °C TO –65°C, 5 CYCLES) SEE NOTE 2.B		LTPD*** = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3* STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031.1 Tstg = 150 ° ± 5°C, 1000 HOURS METHOD 2016.1 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G Y AXIS		LTPD*** = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026 .1 P = 350 MILLIWATTS V_{CE} = +20 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		*** = 10 MAX ACC NO.= ~~8~~ 3
SUBGROUP 5* LEAD TENSION (COND. A) LEAD FATIGUE (COND. E)	METHOD 2036 .1 4 POUNDS LOAD FOR 10 SECONDS 3 ARCS		LTPD*** = 20 (COMBINED) MAX ACC NO.= 3

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2 COLLECTOR CUTOFF CURRENT EMITTER-BASE REVERSE CURRENT DC CURRENT GAIN	 I_{CBO} I_{EBO} hFE	 V_{CB} = 30 V, I_E = 0 V_{EB} =+3 V, I_C = 0 V_{CE} = +10 V, I_C =150 mA	 ±50% **** ±50%**** ±10%****
END POINTS FOR SUBGROUPS 3 & 4 COLLECTOR CUTOFF CURRENT EMITTER-BASE REVERSE CURRENT DC CURRENT GAIN	 I_{CBO} I_{EBO} hFE	 V_{CB} = +30 V, I_E = 0 V_{EB} +3 V, I_C = 0 V_{CE} = +10 V, I_C = 150 mA	 ±100%**** ±100%**** ±20%****
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = +40 V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = +3 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = +10 V, I_C = 150 mA	[illegible] *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF [illegible]. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN [illegible] NANOAMPERES MAY BE CONSIDERED TO BE [illegible] NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

MASTER

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MATERIAL

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN		9FEB65
CHECKED		10Feb65
APPROVED		
APPROVED	Ellen C Hall	19Mar65
APPROVED MIT		18Mar65
APPROVED MSC		3/17/65
		DATE

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TYPE NPN, SWITCHING

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SCALE		SHEET 4 OF 4

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B		REVISED PER TDRR 24263			11/30/65	WK
C		REVISED PER TDRR 25023			1/11/66	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. MARKING:

(1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6323). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL. A LEAKAGE RATE OF 1 X 10^{-8} CC-ATM-SEC OR GREATER SHALL CONSTITUTE A FAILURE.

C. ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

(1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

(2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

COLLECTOR CUTOFF CURRENT
COLLECTOR-BASE BREAKDOWN VOLTAGE
EMITTER-BASE BREAKDOWN VOLTAGE
EMITTER-BASE REVERSE CURRENT
COLLECTOR-EMITTER SUSTAINING VOLTAGE
COLLECTOR-EMITTER CURRENT
COLLECTOR-EMITTER THRESHOLD CURRENT
DIRECT CURRENT GAIN
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE
COLLECTOR CAPACITANCE
TURN-ON AND TURN-OFF TIME

(3) QUALITY DEMONSTRATION TESTING:

PER TABLE III ON LOTS MORE THAN 500 UNITS USING ACCEPTABLE UNITS FROM SUBGROUP 2 OF TABLE II FOR SUBGROUP 2,3, & 4 OF TABLE III. SUBGROUPS 1 & 5 MAY USE ELECTRICAL REJECTS FROM THE SAME LOT.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) "A CERTIFICATE OF COMPLIANCE WITH PARA 2.C (1) OR 2.C(3). UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED UNDER SEPARATE COVER WITH TEST DATA FOR EACH LOT SHIPMENT.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150° C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

(1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 35 VDC
(2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC
(3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC
(4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES
(5) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 50°C/WATT
(6) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 350°C/WATT
(7) TEMP. RANGE, JUNCTION, OPERATING: -65°C TO +150°C
(8) TEMP. RANGE, STORAGE: -65°C TO +150°C

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL NPN

(2) CASE: METAL CASE AND METAL HEADER HERMETICALLY SEALED (JEDEC TO -18)

(3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

(4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:

(1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

MASTER

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CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN H Jones 10 Feb 65
CHECKED Coggins 10 Feb 65
APPROVED
APPROVED Ellen C Hall 18 Mar 65
APPROVED MIT W Kupfer 18 Mar 65
APPROVED MSC 3/1/65
DATE

TRANSISTOR, SILICON,
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SPECIFICATION CONTROL DRAWING

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SIZE C
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PRE-ELECTRICAL TEST PROCESSING			
TEST	MIL-STD-750 TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK *	METHOD 1056, CONDITION B (+150°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE * (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, $T_{stg} = 150° \pm 5°C$, $72 \begin{smallmatrix}+8\\-4\end{smallmatrix}$ HOURS	↓	↓
CONSTANT ACCELERATION *	METHOD 2006 (20,000 G) Y AXIS	↓	↓
POWER, BURN-IN *	METHOD 1026 P = 350 MILLIWATTS V_{CE} = +20.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168 \begin{smallmatrix}+12\\-6\end{smallmatrix}$ HOURS	↓	↓
SEAL TEST *	SEE NOTE 2.B	↓	↓

*TEST TO BE PERFORMED IN ORDER INDICATED

**PULSE $\leq$ 300u SECS AT $\leq$ 2% DUTY CYCLE.

***LTPD OR λ PER MIL-S-19500D, TABLE CI OR CII

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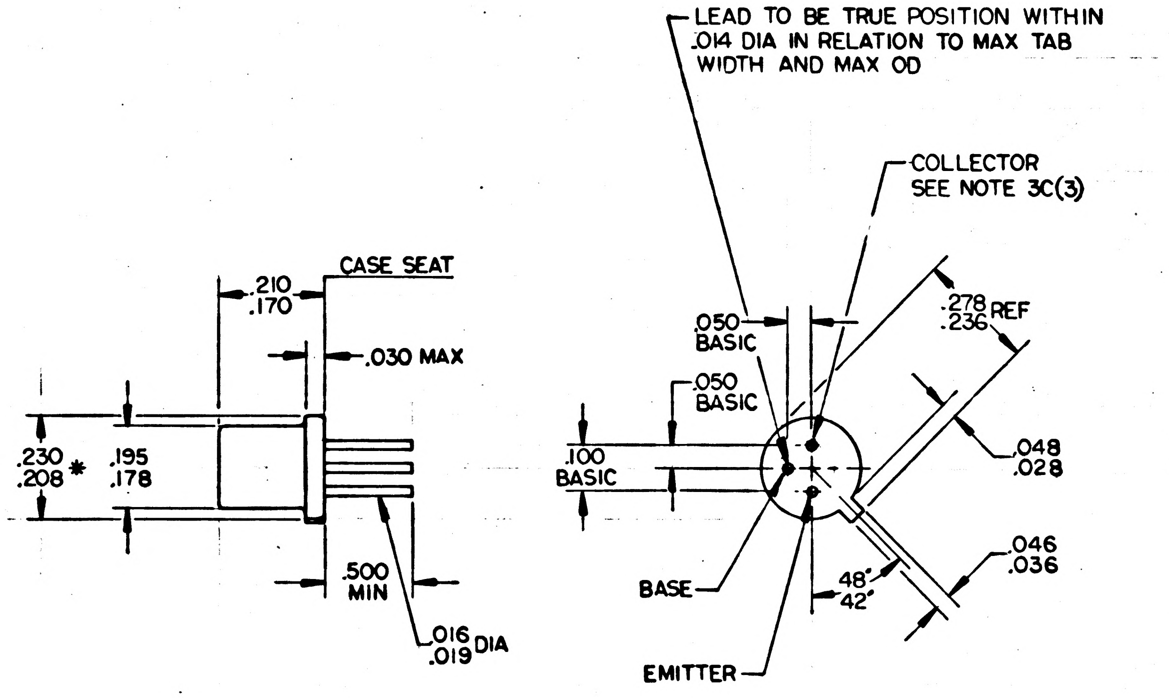

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FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Chelun DATE 3 FEB 65
CHECKED 8 FEB 65
APPROVAL
APPROVAL Eldon C Hall 18 Mar 65
NASA APPROVAL
MIT APPROVAL 18 Mar 65
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WT
SHEET 2 OF 4

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006323 C

REVISIONS					
SYM	DESCRIPTION	DR	CHK	DATE	APPROVED
-	INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WK
A	REVISED PER TDRR 20619			8/17/65	WK
B	REVISED PER TDRR 24263			11/30/65	WK
C	REVISED PER TDRR 25023			1/11/66	WK

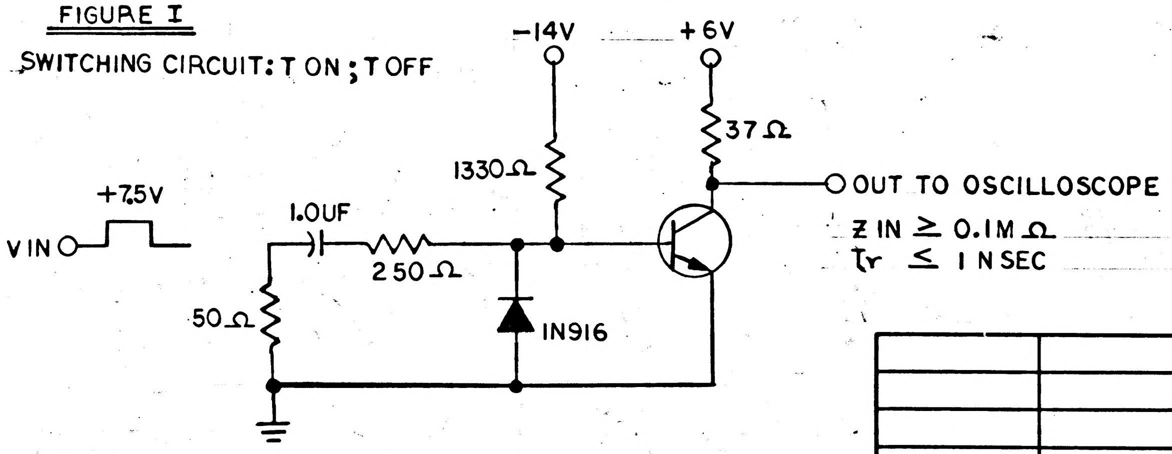
TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS T_A = 25° ± 3°C UNLESS SPECIFIED	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071				LTPD*** = 10 MAX ACC NO. = 3	LTPD*** = 10 MAX ACC NO. = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 30 V; I_E = 0		50	nA	100%	LTPD** = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} = 30 V; I_E = 0, T_A = +150°C		200	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = 100uA; I_E = 0	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = 3 V; I_C = 0		100	nA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = 100uA; I_C = 0	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE**	V_{CEO} SUST	I_C = 30mA PULSED I_B = 0	35		V		
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE} = 30 V: R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE} = +0.4V: V_{CE} = 40V		10	uA		
DC CURRENT GAIN **	h_{FE}	I_C = +500 mA; V_{CE} = +10 V	25				
DC CURRENT GAIN **	h_{FE}	I_C = +150 mA; V_{CE} = +10 V	40	120			
DC CURRENT GAIN **	h_{FE}	I_C = +10 mA; V_{CE} = +10 V	30				
BASE-EMITTER SATURATION VOLTAGE **	V_{BE} SAT	I_C = 500 mA; I_B = 50 mA	1.10	1.30	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE(sat)}$	I_C = 150 mA; I_B = 15 mA		0.40	V		
COLLECTOR-EMITTER SATURATION VOLTAGE**	$V_{CE(sat)}$	I_C = 500 mA; I_B = 50 mA		1.0	V		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = -10 V; I_E = 0; F = 0.14 mc		8	PF		
TURN ON TIME } TEST IN CIRCUIT OF FIGURE I	t_{on}	I_{B1} ≈ 15 mA; I_C ≈ 150 mA t_w > 400 nsec 2% DUTY CYCLE		25	NSEC	LTPD*** = 5 MAX ACC NO = 0	LTPD*** = 5 MAX ACC NO = 0
TURN OFF TIME	t_{off}	I_{B1} = I_{B2} ≈ 15 mA; I_C ≈ 150 mA t_w > 400 nsec 2% DUTY CYCLE		40	NSEC		

FIGURE I

SWITCHING CIRCUIT: T ON ; T OFF



VOLTAGE IN: VIN = +7.5V
PULSE WIDTH: PW = 0.5USEC
TOTAL RISE, FALL: $T_r + T_f \leq$ 6NSEC
IMPEDANCE IN: Z IN = 50 Ω

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN DMS 9FEB65
CHECKED 10Feb65
APPROVED
APPROVED Ellen C Hall 18Mar65
APPROVED MIT W Kupfer 18Mar65
APPROVED MSC 3/18/65
DATE

TRANSISTOR, SILICON, TYPE NPN, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006323
SCALE
SHEET 3 OF 4

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006323 C

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WH
A		REVISED PER TDRR 20619			8/17/65	WH
Ⓜ B		REVISED PER TDRR 24263			11/30/65	WH
C		REVISED PER TDRR 25023			1/11/66	WH

TABLE III

	QUALITY DEMONSTRATION TESTS		
TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	 OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD*** = 20 MAX ACC NO. = 1
SUBGROUP 2* THERMAL SHOCK SEAL TEST	METHOD 1056.1 (+150 °C TO −65°C, 5 CYCLES) SEE NOTE 2.B		LTPD*** = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3* STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031.1 Tstg = 150 ° ± 5°C, 1000 HOURS METHOD 2016.1 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G Y AXIS		LTPD*** = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026 .1 P = 350 MILLIWATTS V_{CE} = +20 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		*** = 10 MAX ACC NO.= B 3
SUBGROUP 5* LEAD TENSION (COND. A) LEAD FATIGUE (COND. E)	METHOD 2036 .1 4 POUND LOAD FOR 10 SECONDS 3 ARCS		LTPD*** = 20 (COMBINED) MAX ACC NO.= 3

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 30 V, I_E = 0	±50% ****
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = +3 V, I_C = 0	±50%****
DC CURRENT GAIN	hFE	V_{CE} = +10 V, I_C =150 mA	±10%****
END POINTS FOR SUBGROUPS 3 & 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = +30 V, I_E = 0	±100%****
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} +3 V, I_C = 0	±100%****
DC CURRENT GAIN	hFE	V_{CE} = +10 V, I_C = 150 mA	±20%****
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = +10 V, I_E = 0	±100% *
EMITTER CUTOFF [illegible]	I_{EBO}	V_{EB} = +3 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = +10 V, I_C = 150 mA	[illegible] *

* [illegible] MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED [illegible] THE INITIAL VALUE AND THE END OF [illegible] OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN [illegible] MAY BE [illegible] TO BE [illegible] FOR [illegible] CHANGE.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN		9FEB65
CHECKED		10Feb65
APPROVED		
APPROVED	Ellen C Hall	19 Mar 65
APPROVED MIT	W Kupfer	18Mar65
APPROVED MSC		3/12/65
		DATE

TRANSISTOR, SILICON
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006323
SCALE		SHEET 4 OF 4

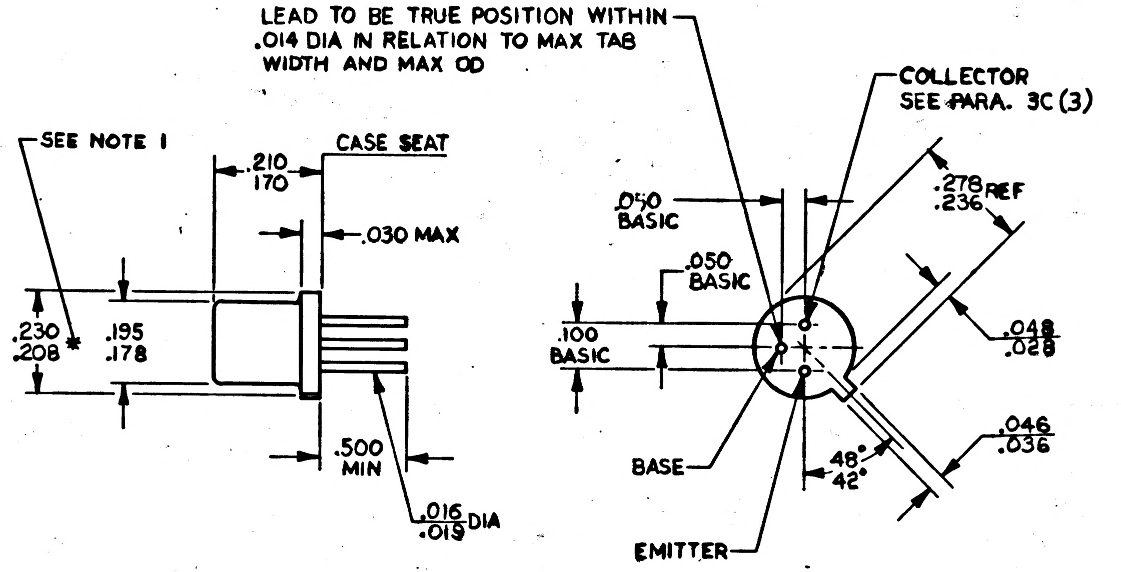
MASTER

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	REPLACES REV C WITH CHANGE PER TDRR 32570	FEB 67	gws RCW

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - E. PROCESSED LOTS MUST MEET THE ACCEPTANCE REQUIREMENTS OF ND 1002313. PROCESSING IN ACCORDANCE WITH ND 1002313 SHALL BE PERFORMED AT LOCATION SPECIFIED BY THE BUYER.
   - F. MARKING:
     - (1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6323). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.
   - G. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
   - B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL. A LEAKAGE RATE OF 1 X 10^{-8} CC-ATM-SEC OR GREATER SHALL CONSTITUTE A FAILURE.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I, AS LISTED BELOW:
     - (1) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE I SHALL BE PERFORMED AS LISTED BELOW:
       - COLLECTOR CUTOFF CURRENT
       - COLLECTOR-BASE BREAKDOWN VOLTAGE
       - EMITTER-BASE BREAKDOWN VOLTAGE
       - EMITTER-BASE REVERSE CURRENT
       - COLLECTOR-EMITTER SUSTAINING VOLTAGE
       - COLLECTOR-EMITTER CURRENT
       - COLLECTOR-EMITTER THRESHOLD CURRENT
       - DIRECT CURRENT GAIN
       - BASE-EMITTER SATURATION VOLTAGE
       - COLLECTOR-EMITTER SATURATION VOLTAGE
       - COLLECTOR CAPACITANCE
       - TURN-ON AND TURN-OFF TIME



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS + ___ −
3 PLACE DECIMALS + ___ −
ANGLES + ___ −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. JONES DATE 10 FEB 65
CHECKED A. CAGGIANO 10 FEB 65
APPROVAL ELDON C. HALL 18 MAR 65
CONTRACT NAS 9-497
NASA APPROVAL J. MICHAELS 18 MAR 65
MIT APPROVAL W. KUPFER 18 MAR 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

SIZE
CODE IDENT NO. 80230
1006323
SCALE NONE
SHEET 1 of 3

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	REPLACES REV C WITH CHANGE PER TDRR 32570	1 FEB 67	JWL / RCG

REQUIREMENTS: (CONTINUED)

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
  (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.
  (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150°C.

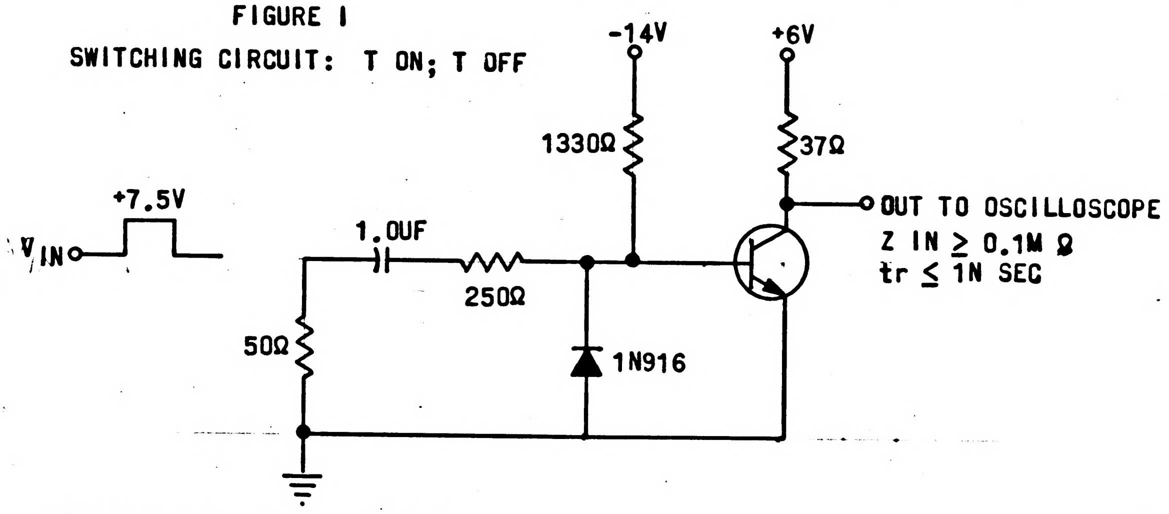
B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.
  (1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 35 VDC.
  (2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC.
  (3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC.
  (4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES.
  (5) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 50°C/WATT.
  (6) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 350°C/WATT.
  (7) TEMP. RANGE, JUNCTION, OPERATING: -65°C TO +150°C.
  (8) TEMP. RANGE, STORAGE: -65°C TO +150°C.

C. CONSTRUCTION:
  (1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL NPN.
  (2) CASE: METAL CASE AND METAL HEADER HERMETICALLY SEALED (JEDEC TO -18).
  (3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
  (4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:
  (1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
  (2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25°C ± 3°C.

FIGURE I

SWITCHING CIRCUIT: T ON; T OFF



VOLTAGE IN: $V_{IN} = +7.5V$
PULSE WIDTH: PW = 0.5U SEC
TOTAL RISE, FALL: $t_r + t_f \leq$ 6N SEC
IMPEDANCE IN: $Z_{IN} = 50\Omega$

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + − 3 PLACE DECIMALS + − ANGLES + −	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	DRAWN H. JONES DATE 10 FEB 65 CHECKED A. CAGGIANO 10 FEB 65 APPROVAL ELDON C. HALL 10 FEB 65	TRANSISTOR, SILICON, TYPE NPN, SWITCHING
DO NOT SCALE THIS DRAWING	CONTRACT NAS 9-497	SPECIFICATION CONTROL DRAWING
MATERIAL SEE REQUIREMENTS	NASA APPROVAL J MICHAELS 18 MAR 65	SIZE CODE IDENT NO. 80230 1006323
APPROVAL	MIT APPROVAL W KUPFER 18 MAR 65	SCALE NONE SHEET 2 of

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	REPLACES REV C WITH CHANGE PER TDRR 32570	1 FEB 67	RCG

TABLE I

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS T_A = 25° ± 3°C UNLESS SPECIFIED	LIMIT MIN	LIMIT MAX	UNITS	TESTING REQUIRED
SUBGROUP 1						
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071				LTPD = 10 (NOTE 1) MAX ACC NO. = 3
SUBGROUP 2						
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB}=30 V; I_E=0		100	NA	100%
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB}=30 V; I_E=0, T_A=+150°C		200	µA	
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C=100µA; I_E=0	60		V	
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB}=3 V; I_C=0		100	NA	
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E=100µA; I_C=0	5		V	
COLLECTOR-EMITTER SUSTAINING VOLTAGE (NOTE 2)	$V_{CEO\ SUST}$	I_C=30 mA PULSED; I_B=0	35		V	
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE}=30 V; R_{BE}=100 K		10	µA	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE}=+0.4V; V_{CE}=40V		10	µA	
DC CURRENT GAIN (NOTE 2)	h_{FE}	I_C=+500 mA; V_{CE}=+10V	25			
DC CURRENT GAIN (NOTE 2)	h_{FE}	I_C=+150 mA; V_{CE}=+10V	40	120		
DC CURRENT GAIN (NOTE 2)	h_{FE}	I_C=+10 mA; V_{CE}=+10V	30			
BASE-EMITTER SATURATION VOLTAGE (NOTE 2)	$V_{BE(SAT)}$	I_C=500 mA; I_B=50 mA	1.00	1.30	V	
COLLECTOR-EMITTER SATURATION VOLTAGE (NOTE 2)	$V_{CE(sat)}$	I_C=150 mA; I_B=15 mA		0.40	V	
COLLECTOR-EMITTER SATURATION VOLTAGE (NOTE 2)	$V_{CE(sat)}$	I_C=500 mA; I_B=50 mA		1.0	V	100%
COLLECTOR CAPACITANCE	C_{ob}	V_{CB}=-10V; I_E=0; F=0.14 mc		8	PF	LTPD = 5 (NOTE 3) MAX ACC NO. = 0
TURN ON TIME } TEST IN CIRCUIT OF FIGURE 1	t_{on}	I_{B1} ≈ 15 mA (NOTE 4); I_C ≈ 150 mA (NOTE 4) t_w > 400 nsec 2% DUTY CYCLE		25	NSEC	
TURN OFF TIME	t_{off}	I_{B1} = I_{B2} ≈ 15mA (NOTE 4); I_C ≈ 150mA (NOTE 4) t_w > 400 nsec 2% DUTY CYCLE		40	NSEC	

NOTES:

1. LTPD = 5, MAXIMUM ACCEPT NO. = 1, REJECT = 2.
2. PULSE ≤ 300 µSECS. AT ≤ 2% DUTY CYCLE.
3. LTPD OR λ PER MIL-S-19500 D, TABLE C1 OR CII.
4. CURRENTS TO WITHIN ±10%.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS + −
3 PLACE DECIMALS + −
ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN H. JONES DATE 10 FEB 65
CHECKED A. CAGGIANO 10 FEB 65
APPROVAL ELDON C. HALL 18 MAR 65
CONTRACT NAS 9-497
NASA APPROVAL J MICHAELS 18 MAR 65
MIT APPROVAL W KUPFER 18 MAR 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006323
SCALE NONE
SHEET 3 of

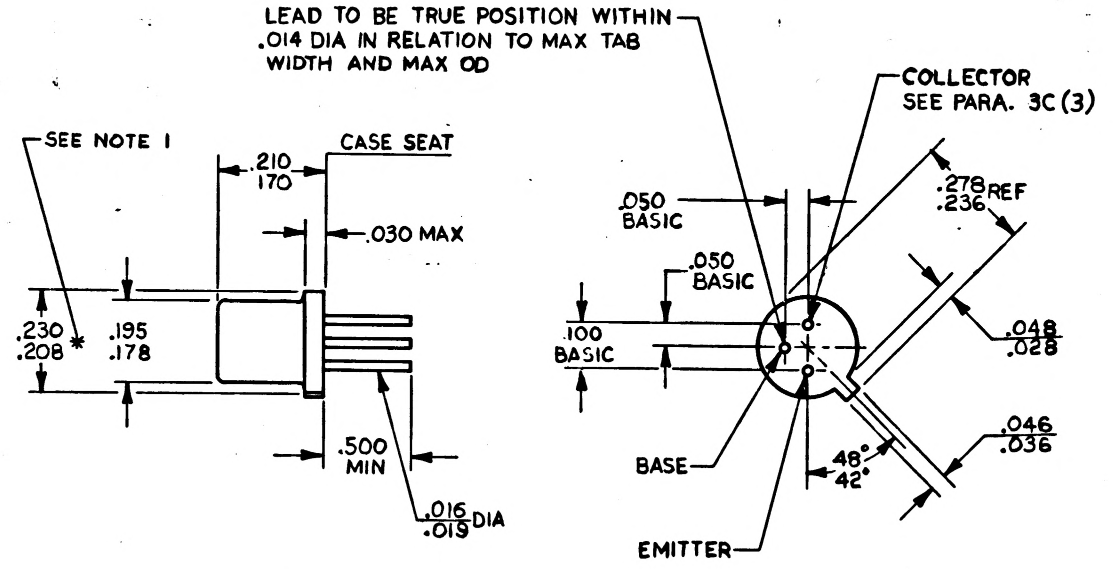
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	REPLACES REV C WITH CHANGE PER TDRR 32570	1 FEB 67	JWS RCG
	E	REVISED PER TDRR 32869	15 FEB 67	JWS RCG

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - E. PROCESSED LOTS MUST MEET THE ACCEPTANCE REQUIREMENTS OF ND 1002313. PROCESSING IN ACCORDANCE WITH ND 1002313 SHALL BE PERFORMED AT LOCATION SPECIFIED BY THE BUYER.
   - F. MARKING:
     - (1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6323). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.
   - G. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
   - B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL. A LEAKAGE RATE OF 1 X 10^{-8} CC-ATM-SEC OR GREATER SHALL CONSTITUTE A FAILURE.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I, AS LISTED BELOW:
     - (1) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE I SHALL BE PERFORMED AS LISTED BELOW:
       - COLLECTOR CUTOFF CURRENT
       - COLLECTOR-BASE BREAKDOWN VOLTAGE
       - EMITTER-BASE BREAKDOWN VOLTAGE
       - EMITTER-BASE REVERSE CURRENT
       - COLLECTOR-EMITTER SUSTAINING VOLTAGE
       - COLLECTOR-EMITTER CURRENT
       - COLLECTOR-EMITTER THRESHOLD CURRENT
       - DIRECT CURRENT GAIN
       - BASE-EMITTER SATURATION VOLTAGE
       - COLLECTOR-EMITTER SATURATION VOLTAGE
       - COLLECTOR CAPACITANCE
       - TURN-ON AND TURN-OFF TIME

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS + ___ − 3 PLACE DECIMALS + ___ − ANGLES + ___ −

DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. JONES DATE 10 FEB 65
CHECKED A. CAGGIANO 10 FEB 65
APPROVAL ELDON C. HALL 18 MAR 65
CONTRACT NAS 9-497
NASA APPROVAL J. MICHAELS 18 MAR 65
MIT APPROVAL W. KUPFER 18 MAR 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006323
SCALE NONE
SHEET 1 of 3

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	REPLACES REV C WITH CHANGE PER TDRR 32570	1 FEB 67	JWS RCG
	E	REVISED PER TDRR 32869	16 FEB 67	JWS RCG

REQUIREMENTS: (CONTINUED)

D. VENDOR SUPPLIER DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
- (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.
- (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

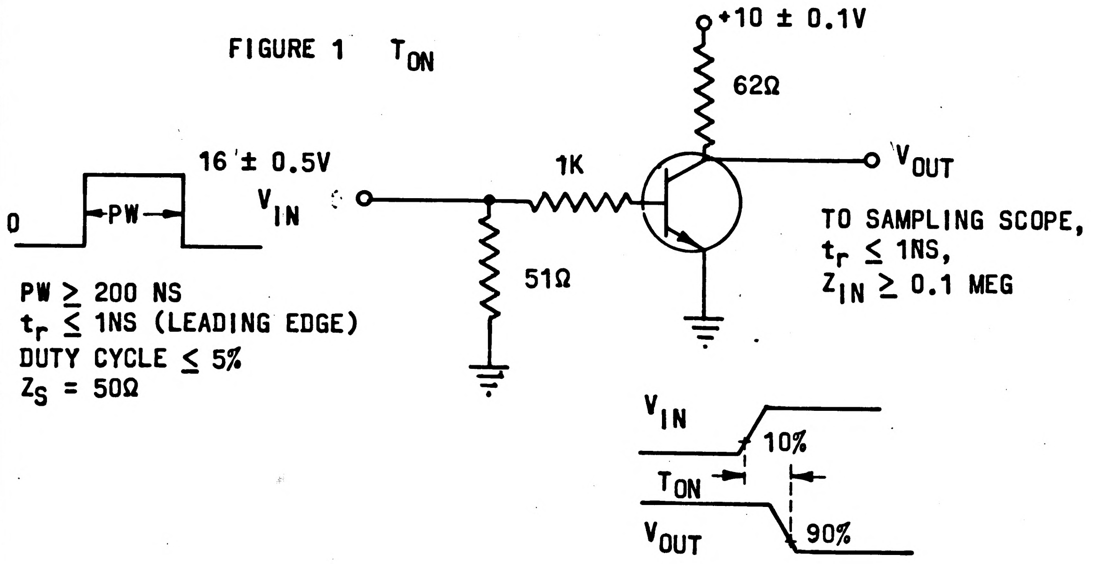
A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150°C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.
- (1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 35 VDC.
- (2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC.
- (3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC.
- (4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES.
- (5) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 50°C/WATT.
- (6) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 350°C/WATT.
- (7) TEMP. RANGE, JUNCTION, OPERATING: -65°C TO +150°C.
- (8) TEMP. RANGE, STORAGE: -65°C TP +150°C.

C. CONSTRUCTION:
- (1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL NPN.
- (2) CASE: METAL CASE AND METAL HEADER HERMETICALLY SEALED (JEDEC TO -18).
- (3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
- (4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND1015402.

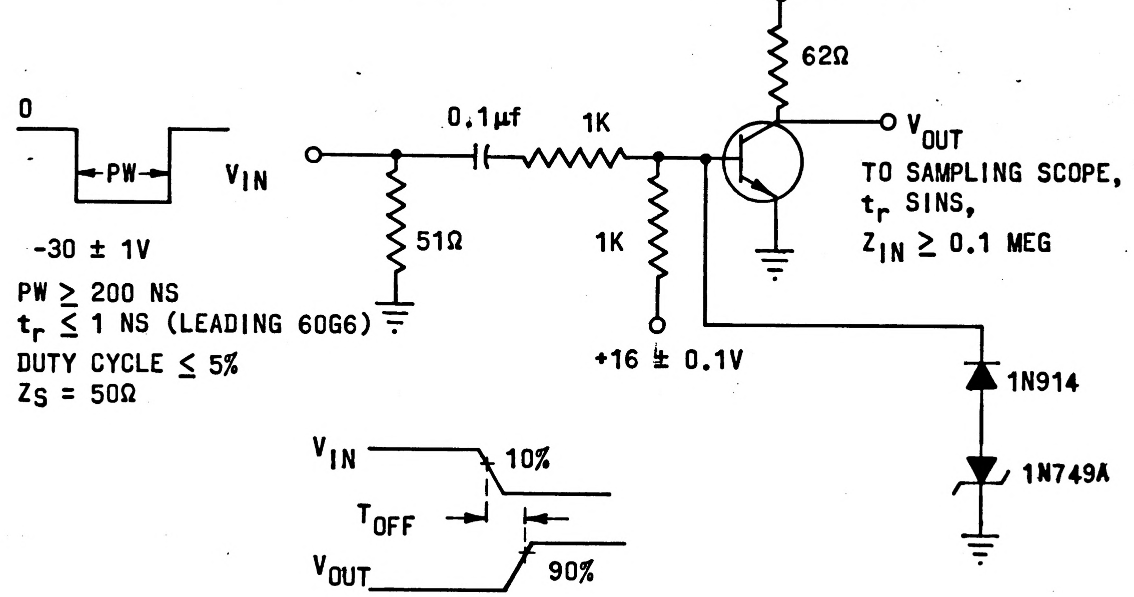
D. QUALITY ASSURANCE REQUIREMENTS:
- (1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
- (2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25°C ± 3°C.

FIGURE 1 T_{ON}



+10 ± 0.1V
62Ω
16 ± 0.5V
0
PW
V_{IN}
1K
V_{OUT}
51Ω
TO SAMPLING SCOPE,
$t_r \leq$ 1NS,
$Z_{IN} \geq$ 0.1 MEG
PW ≥ 200 NS
$t_r \leq$ 1NS (LEADING EDGE)
DUTY CYCLE ≤ 5%
Z_S = 50Ω
V_{IN}
10%
T_{ON}
V_{OUT}
90%

FIGURE 2 T_{OFF}



+10±0.1V
62Ω
0
PW
V_{IN}
0.1µf
1K
V_{OUT}
TO SAMPLING SCOPE,
t_r SINS,
$Z_{IN} \geq$ 0.1 MEG
-30 ± 1V
51Ω
1K
PW ≥ 200 NS
$t_r \leq$ 1 NS (LEADING 60G6)
DUTY CYCLE ≤ 5%
Z_S = 50Ω
+16 ± 0.1V
1N914
1N749A
V_{IN}
10%
T_{OFF}
V_{OUT}
90%

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS + −
3 PLACE DECIMALS + −
ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN H. JONES DATE 10 FEB 65
CHECKED A. CAGGIANO 10 FEB 65
APPROVAL ELDON C. HALL 10 FEB 65
CONTRACT NAS 9-497
NASA APPROVAL J. MICHAELS 18 MAR 65
MIT APPROVAL W KUPFER 18 MAR 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1006323
SCALE NONE
SHEET 2 OF

MIL-1068C D

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	REPLACES REV C WITH CHANGE PER TDRR 32570	1 FEB 67	RCG
	E	REVISED PER TDRR 32869	10 FEB 67	JWL RCG

TABLE I

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS T_A = 25° ± 3°C UNLESS SPECIFIED	LIMIT MIN	LIMIT MAX	UNITS	TESTING REQUIRED
SUBGROUP 1						
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071				LTPD = 10 (NOTE 1) MAX ACC NO. = 3
SUBGROUP 2						
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB}=30 V; I_E=0		100	NA	100%
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB}=30 V; I_E=0, T_A=+150°C		200	μA	
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C=100μA; I_E=0	60		V	
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB}=3 V; I_C=0		100	NA	
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E=100μA; I_C=0	5		V	
COLLECTOR-EMITTER SUSTAINING VOLTAGE (NOTE 2)	V_{CEO} SUST	I_C=30 mA PULSED; I_B=0	35		V	
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE}=30 V; R_{BE}=100 K		10	μA	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE}=+0.4V; V_{CE}=40V		10	μA	
DC CURRENT GAIN (NOTE 2)	h_{FE}	I_C=+500 mA; V_{CE}=+10V	25			
DC CURRENT GAIN (NOTE 2)	h_{FE}	I_C=+150 mA; V_{CE}=+10V	40	120		
DC URRENT GAIN (NOTE 2)	h_{FE}	I_C=+10 mA; V_{CE}=+10V	30			
BASE-EMITTER SATURATION VOLTAGE (NOTE 2)	$V_{BE(SAT)}$	I_C=500 mA; I_B=50 mA	1.00	1.30	V	
COLLECTOR-EMITTER SATURATION VOLTAGE (NOTE 2)	$V_{CE(sat)}$	I_C=150 mA; I_B=15 mA		0.40	V	
COLLECTOR-EMITTER SATURATION VOLTAGE (NOTE 2)	$V_{CE(sat)}$	I_C=500 mA; I_B=50 mA		1.0	V	100%
COLLECTOR CAPACITANCE	C_{ob}	V_{CB}=-10V; I_E=0; F=0.14 mc		8	PF	LTPD = 5 (NOTE 3) MAX ACC NO. = 0
TURN ON TIME TEST IN CIRCUIT OF FIGURE 1	t_{on}	I_{B1} ≈ 15 mA (NOTE 4); I_C ≈ 150 mA (NOTE 4) t_w > 400 nsec 2% DUTY CYCLE		25	NSEC	
TURN OFF TIME TEST IN CIRCUIT OF FIGURE 2	t_{off}	I_{B1} = I_{B2} ≈ 15mA (NOTE 4); I_C ≈ 150mA (NOTE 4) t_w > 400 nsec 2% DUTY CYCLE		40	NSEC	

NOTES:

1. LTPD = 5, MAXIMUM ACCEPT NO. = 1, REJECT = 2.
2. PULSE ≤ 300 μSECS. AT ≤ 2% DUTY CYCLE.
3. LTPD OR λ PER MIL-S-19500 D, TABLE CI OR CII.
4. CURRENTS TO WITHIN ±10%.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS ± · 3 PLACE DECIMALS ± · ANGLES ±	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN H. JONES DATE 10 FEB 65 CHECKED A. CAGGIANO 10 FEB 65 APPROVAL ELDON C. HALL 18 MAR 65 CONTRACT NAS 9-497	TRANSISTOR, SILICON, TYPE NPN, SWITCHING SPECIFICATION CONTROL DRAWING
MATERIAL SEE REQUIREMENTS	NASA APPROVAL J MICHAELS 18 MAR 65	SIZE C · CODE IDENT NO. 80230 · 1006323
APPROVAL	MIT APPROVAL W KUPFER 18 MAR 65	SCALE NONE · SHEET 3 of

—	1006323

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A 17476 PER TDRR			18 Mar 65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500/290 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. MARKING:

(1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) OR AS MANY SIGNIFICANT DIGITS AS POSSIBLE (E.G. 6323). OTHER MARKING SUCH AS MANUFACTURER'S IDENTIFICATION AND TYPE NUMBER IS PERMISSIBLE.

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

B. SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC AND A HOT GLYCERINE BUBBLE TEST FOR GROSS LEAKS. THE LEAK TEST SHALL BE PERFORMED IN ACCORDANCE WITH MIL-STD-202C METHOD 112. TEST CONDITION C SHALL BE USED FOR THE HELIUM OR RADIFLO TEST. TEST CONDITION A SHALL BE USED FOR THE GROSS LEAK TEST EXCEPT THAT GLYCERINE SHALL REPLACE THE MINERAL OIL. A LEAKAGE RATE OF 1 X 10^{-8} CC-ATM-SEC OR GREATER SHALL CONSTITUTE A FAILURE.

C. ELECTRICAL CHARACTERISTICS: PER TABLES I, II, AND III AS LISTED BELOW:

(1) PRE-ELECTRICAL TEST PROCESSING: ON LOTS OF 500 OR LESS, THE TESTS OF TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II.

(2) ELECTRICAL TESTING: THE TESTS LISTED IN TABLE II SHALL BE PERFORMED AS LISTED BELOW:

COLLECTOR CUTOFF CURRENT
COLLECTOR-BASE BREAKDOWN VOLTAGE
EMITTER-BASE BREAKDOWN VOLTAGE
EMITTER-BASE REVERSE CURRENT
COLLECTOR-EMITTER SUSTAINING VOLTAGE
COLLECTOR-EMITTER CURRENT
COLLECTOR-EMITTER THRESHOLD CURRENT
DIRECT CURRENT GAIN
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE
COLLECTOR CAPACITANCE
TURN-ON AND TURN-OFF TIME

(3) QUALITY DEMONSTRATION TESTING:

PER TABLE III ON LOTS MORE THAN 500 UNITS USING ACCEPTABLE UNITS FROM SUBGROUP 2 OF TABLE II FOR SUBGROUP 2,3, & 4 OF TABLE III. SUBGROUPS 1 & 5 MAY USE ELECTRICAL REJECTS FROM THE SAME LOT.

D. VENDOR SUPPLIED DATA: EACH SHIP ACCOMPANIED BY THE FOLLOWING DOC

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL ASS 2. REQUIREMENT.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) "A CERTIFICATE OF COMPLIANCE WITH PARA 2.C (1) OR 2.C(3). UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED UNDER SEPARATE COVER WITH TEST DATA FOR EACH LOT SHIPMENT.

3. DESIGN:

A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +200°C.

B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT.

(1) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): 30 VDC
(2) COLLECTOR-BASE VOLTAGE (V_{CBO}): 60 VDC
(3) EMITTER-BASE VOLTAGE (V_{EBO}): 5 VDC
(4) COLLECTOR CURRENT (I_C): 600 MILLIAMPERES
(5) POWER DISSIPATION (PT)
0.4 WATTS AT 25°C AMBIENT TEMPERATURE
1.8 WATTS AT 25°C CASE TEMPERATURE
(6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT
(7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 485°C/WATT
(8) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
(9) TEMPERATURE RANGE, STORAGE: -65°C TO +300°C

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL NPN

(2) CASE: METAL CASE AND METAL HEADER HERMETICALLY SEALED (JEDEC TO -18)

(3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

(4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH ND 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:

(1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

(2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25° ± 3°C.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	H Jones	10 Feb 65
CHECKED	C Cuggins	10 Feb 65
APPROVED		
APPROVED	Ellen C Hall	18 Mar 65
APPROVED MIT	W Kupfer	18 Mar 65
APPROVED MSC	W Michael	3/18/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
—	C	1006323
SCALE		SHEET 1 OF 4

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— | 1006323

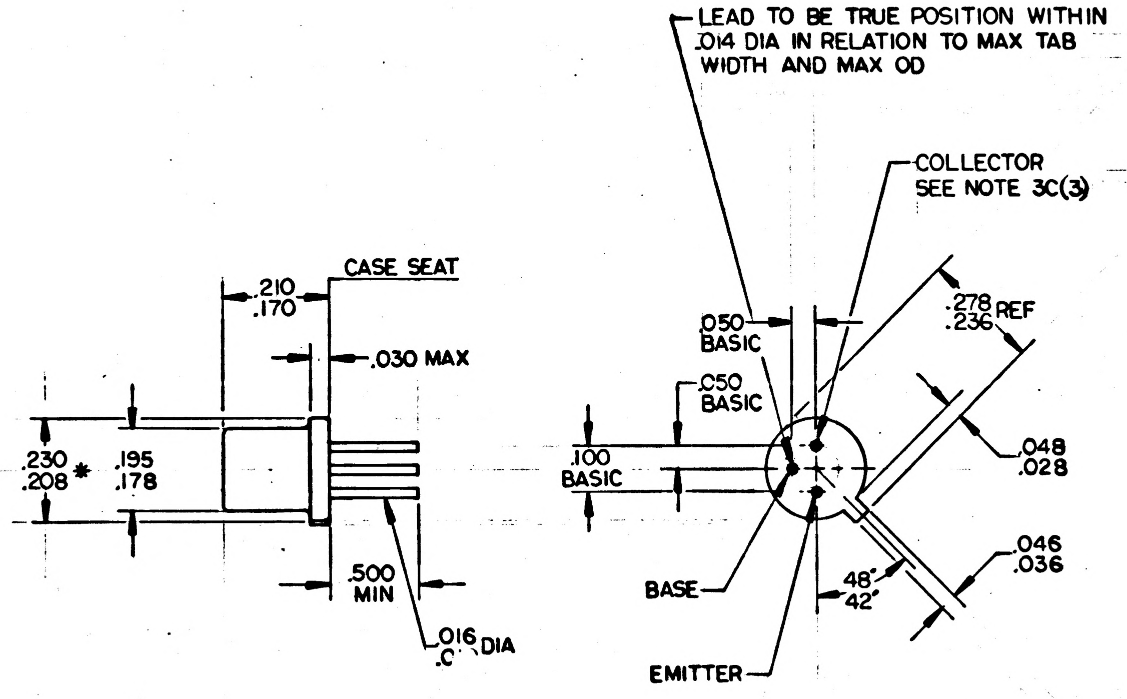
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 17476	19Mar65	WK

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE (HIGH TEMPERATURE STABILIZATION)	METHOD 1031, T_{stg} = 300° ± 5°C, 72^{+8}_{-4} HOURS	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 270 MILLIWATTS V_{CE} = +11.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168^{+12}_{-6} HOURS	↓	↓
SEAL TEST	SEE NOTE 2.B	↓	↓



LEAD TO BE TRUE POSITION WITHIN .014 DIA IN RELATION TO MAX TAB WIDTH AND MAX OD
COLLECTOR SEE NOTE 3C(3)
CASE SEAT
.210
.170
.030 MAX
.230
.208
*
.195
.178
.500 MIN
.016 .0 DIA
.050 BASIC
.050 BASIC
.100 BASIC
.278 .236 REF
.048 .028
.046 .036
48° 42°
BASE
EMITTER

MASTER

NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 3FEB65
CHECKED [illegible] 8 FEB 65
APPROVAL
APPROVAL Eldon C Hall 18 Mar 65
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 18 Mar 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006323
SCALE NONE WT SHEET 2 OF 4

4 3 2 1

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— 1006323

REVISIONS					
SYM	DESCRIPTION	DR	CHK	DATE	APPROVED
-	INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WK

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	MIL-STD-750 TEST CONDITIONS T_A = 25° ± 3°C UNLESS SPECIFIED	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071				LTPD* = 10 MAX ACC NO.= 3	LTPD* = 10 MAX ACC NO. = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 30 V; I_E = 0		100	~~mA~~ NA	100%	LTPD* = 2 (COMBINED) MAX ACC NO.= 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} = 30 V; I_E =0, T_A = +150°C		200	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = 100uA; I_E = 0	60		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = 3 V; I_C = 0		100	~~mA~~		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = 100uA; I_C = 0	5		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	I_C = 30mA PULSED I_B = 0	30		V		
COLLECTOR-EMITTER CURRENT RES. RETURN	I_{CER}	V_{CE} = 30 V; R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE} = +0.4V;V_{CE} = 30 V		10	uA		
DC CURRENT GAIN	h_{FE}	I_C = +500 mA; V_{CE} = +10 V	25				
DC CURRENT GAIN	h_{FE}	I_C = +150 mA; V_{CE} = +10 V	40	120			
DC CURRENT GAIN	h_{FE}	I_C = +10 mA; V_{CE} = +10 V	30				
BASE-EMITTER SATURATION VOLTAGE	V_{BE} SAT	I_C = 500 mA; I_B = 50 mA	1.05	1.35	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE(sat)}$	I_C = 150 mA; I_B = 15 mA		0.40	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE(sat)}$	I_C = 500 mA; I_B = 50 mA		1.0	V		
COLLECTOR CAPACITANCE	C_{obo}	V_{CB} = -10 V; I_E = 0; F = 0.14 mc		8	PF		
TURN ON TIME	t_{on}	$I_{B1} = I_{B2} \approx 15$ mA; $I_C \approx 150$ mA t_w > 400 nsec 2% DUTY CYCLE		25	NSEC		
TURN OFF TIME	t_{off}	$I_{B1} = I_{B2} \approx 15$ mA; $I_C \approx 150$ mA t_w > 400 nsec 2% DUTY CYCLE		40	NSEC		

* LTPD PER MIL-S-19500D, TABLE CI OR II

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	DMS	9FEB65
CHECKED		10Feb65
APPROVED		
APPROVED	Eldon C Hall	18Mar65
APPROVED MIT	W Kupfer	18Mar65
APPROVED MSC		3/18/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
DRAWING NO. 1006323
SCALE
SHEET 3 OF 4

4 3 2 1

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—	1006323

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 17476			18Mar65	WH

TABLE III

	QUALITY DEMONSTRATION TESTS		
TEST	MIL-STD-750 TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO. = 1
SUBGROUP 2** THERMAL SHOCK SEAL TEST	METHOD 1056.1 (+200°C TO +65°C, 5 CYCLES) SEE NOTE 2.B		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031.1 Tstg = 200° ± 5°C, 1000 HOURS METHOD 2016.1 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026 .1 P = 270 MILLIWATTS V_{CE} = +11 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		* = 10 MAX ACC NO.= B 3
SUBGROUP 5** LEAD TENSION (COND. A) LEAD FATIGUE (COND. E)	METHOD 2036 .1 4 POUND LOAD FOR 10 SECONDS 6 ARCS		LTPD = 20 (COMBINED) MAX ACC NO.= 3

* PER MIL-S-19500D TABLE CI OR II

** TESTS TO BE PERFORMED IN ORDER INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 40 V, I_E = 0	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = +3 V, I_C = 0	±50% *
DC CURRENT GAIN	hFE	V_{CE} = +10 V, I_C = 150 mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = +40 V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = +3 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = +10 V, I_C = 150 mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 NANOAMPERES MAY BE CONSIDERED TO BE 5 NANOAMPERES FOR CALCULATING PERCENTAGE CHANGE.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	W. Jones	9FEB65
CHECKED	A. Caggiano	10Feb65
APPROVED		
APPROVED	Eldon C Hall	18Mar65
APPROVED MIT	W Kupfer	18Mar65
APPROVED MSC		3/12/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON
TYPE NPN, SWITCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
—	C	1006323
SCALE		SHEET 4 OF 4

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006324 A

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
REVISIONS						
—		INITIAL RELEASE CLASS A PER TDRR 19689			5-26-65	WK.
A		REVISED PER TDRR 20880			7-20-65	MDM

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-15305 TYPE LT4K, GRADE 1, CLASS B AS MODIFIED BY THE REQUIREMENTS OF THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002060 EXCEPT THAT IMMERSION PER MIL-C-15305 SHALL BE METHOD A (NO SALT).

E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE INDUCTANCE VALUE RANGE, DC RESISTANCE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100% UNLESS OTHERWISE SPECIFIED)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) LEAD MATERIAL: WELDABLE, GOLD PLATED IRON-NICKEL ALLOY (DUMET) PER ND 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT. THE EXPOSED PORTION OF THE LEADS SHALL BE FREE OF SOLDER.

(3) TORQUE:

(a) STARTING: 0.1 IN OZ MINIMUM

(b) PREVAILING: 2.5 IN OZ MAXIMUM

(c) MAXIMUM TORQUE: UNIT SHALL BE CAPABLE OF WITHSTANDING 3.5 IN OZ MAX. WITH THE TUNING SLUG AT EITHER STOP. UTMOST CARE SHOULD BE USED NOT TO EXCEED THIS LIMIT.

B. ELECTRICAL CHARACTERISTICS:

(1) INDUCTANCE TUNING RANGE: FROM 8 MICROHENRIES TO 15 MICROHENRIES AT 2.0 MEGACYCLES ± 1% USING A BOONTON 260A Q METER (OR EQUIVALENT) WITH A 420 PF OR 790 PF ± 5% ARCO ELECTRONICS DUR-MICA CAPACITOR (OR EQUIVALENT) IN PARALLEL WITH THE COIL. 420 PF AT 8 UH AND 790 PF AT 15 UH.

(2) Q-FACTOR: 30 MIN AT 8 MICROHENRIES AND 50 MIN AT 15 MICROHENRIES USING THE SAME EQUIPMENT SPECIFIED IN PARAGRAPH 2.B.(1).

(3) DC RESISTANCE: 1.9 OHMS MAX.

(4) RESONANT FREQUENCY: 15 MEGACYCLES MINIMUM.

(5) INDUCTANCE - TEMP COEF: ± 150 PPM/C° FROM 0°C TO +70°C. TEST ONE (1) SAMPLE PER LOT

(6) TEST VOLTAGE: 100 VRMS BETWEEN WINDING AND THE TUNING SLUG WHEN IN THE MAXIMUM INDUCTANCE POSITION.

(7) DISTRIBUTED CAPACITANCE: (TWO (2) FREQUENCY METHOD)

8 PICOFARADS ± 5% AT 15 MICROHENRIES

7.3 PICOFARADS ± 5% AT 11 MICROHENRIES

7.2 PICOFARADS ± 5% AT 8 MICROHENRIES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:

(1) CERTIFICATE OF COMPLIANCE TO ND 1015404.

(2) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

(3) CERTIFICATE OF COMPLIANCE WITH SPECIAL CONDITIONING.

(4) TEST DATA FROM SPECIAL CONDITIONING.

3. DESIGN:

A. OPERATING LIFE: 2000 HOURS MINIMUM AT MAXIMUM CURRENT AND TEMPERATURE RATINGS. THE ADJUSTMENT SCREW SHALL BE CAPABLE OF 100 CYCLES OF OPERATION. ONE CYCLE EQUALS ADJUSTMENT ALL THE WAY IN AND ALL THE WAY OUT.

B. CONSTRUCTION: PLASTIC CASE WITH AN ALUMINUM (LEAD SCREW) TUNING SHAFT WHICH CONTROLS THE BONDED FERROUS SLUG. THE UNIT SHALL HAVE AN ADEQUATE "O" RING SEAL ON THE TUNING SHAFT TO PREVENT POTTING AND MOISTURE PENETRATION.

C. OPERATING TEMPERATURE RANGE: 0°C TO +70°C.

D. CURRENT RATING (MAXIMUM): 450 MILLIAMPERES. UNDER THIS CONDITION THE TEMPERATURE RISE WILL BE 35°C SO THE AMBIENT SHOULD NOT EXCEED 70°C.

E. LEAD FATIGUE: EACH LEAD SHALL BE CAPABLE OF MEETING THE PULL AND BEND TEST, HOWEVER THE SAME LEAD SHALL NOT BE TESTED FOR BOTH. NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

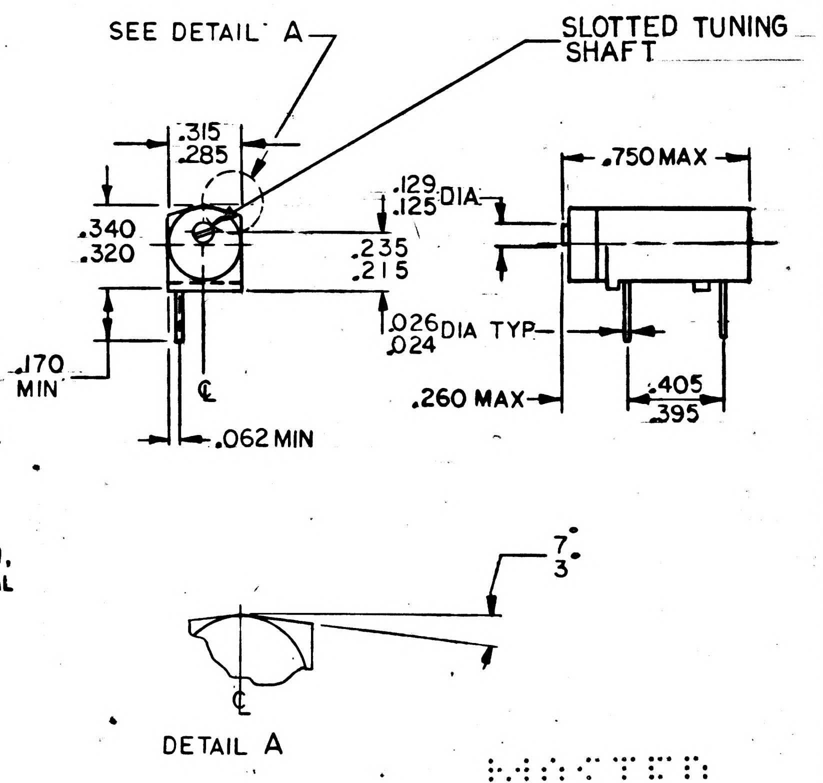
BEND TEST (DISCARD TESTED UNITS): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION.

4. SPECIAL CONDITIONING: EACH LOT SHALL BE TEMPERATURE CYCLED BY THE VENDOR AND TEST DATA SUPPLIED WITH EACH SHIPMENT.

STEP 1 MEASURE AND RECORD THE INDUCTANCE AND Q AT THE MID RANGE VALUE.

STEP 2 PERFORM SIX (6) CYCLES OF 125°C FOR 30 MIN, 25°C FOR 15 MIN, -55°C FOR 30 MIN. AFTER THE 6TH CYCLE PERFORM AN ADDITIONAL 125°C FOR 30 MIN AND THEN WITHIN 2 MIN MEASURE INDUCTANCE AND Q. THE Q SHOULD BE WITHIN SPECIFIED LIMITS AND THE INDUCTANCE SHOULD BE WITHIN 10% OF THE ORIGINAL VALUE. PERFORM THE SEVENTH -55°C CYCLE AND WITHIN 1/2 HOUR THE INDUCTANCE SHOULD BE WITHIN 5% AND THE Q SHOULD BE WITHIN THE SPECIFIED LIMIT.

CAUTION SEE NOTE 2A(3)(c)



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN EWS 10APR65
CHECKED Tom Adrian 13APR65
APPROVED
APPROVED Eldon C Hall 26 May 65
APPROVED MIT W Kupfer 26 May 65
APPROVED MSC 5/26/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006324
SCALE NONE
SHEET 1 OF 1

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B 1006324

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19689			5-26-65	WK.
A		REVISED PER TDRR 20880			7-20-65	M.I.M.
B		REVISED PER TDRR 21863			9/8/65	WK

REQUIREMENTS:

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C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002060 EXCEPT THAT IMMERSION PER MIL-C-15305 SHALL BE METHOD A (NO SALT).

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2. ACCEPTANCE AND INSPECTION: (100% UNLESS OTHERWISE SPECIFIED)

A. MECHANICAL PROPERTIES:

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(2) LEAD MATERIAL: WELDABLE, GOLD PLATED IRON-NICKEL ALLOY (DUMET) PER ND 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT. THE EXPOSED PORTION OF THE LEADS SHALL BE FREE OF SOLDER.

(3) TORQUE:

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(b) PREVAILING: 2.5 IN OZ MAXIMUM

(c) MAXIMUM TORQUE: UNIT SHALL BE CAPABLE OF WITHSTANDING 3.5 IN OZ MAX. WITH THE TUNING SLUG AT EITHER STOP. UTMOST CARE SHOULD BE USED NOT TO EXCEED THIS LIMIT.

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(4) RESONANT FREQUENCY: 15 MEGACYCLES MINIMUM.

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(4) TEST DATA FROM SPECIAL CONDITIONING.

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B. CONSTRUCTION: PLASTIC CASE WITH AN ALUMINUM (LEAD SCREW) TUNING SHAFT WHICH CONTROLS THE BONDED FERROUS SLUG. THE UNIT SHALL HAVE AN ADEQUATE "O" RING SEAL ON THE TUNING SHAFT TO PREVENT POTTING AND MOISTURE PENETRATION.

C. OPERATING TEMPERATURE RANGE: 0°C TO +70°C.

D. CURRENT RATING (MAXIMUM): 450 MILLIAMPERES. UNDER THIS CONDITION THE TEMPERATURE RISE WILL BE 35°C SO THE AMBIENT SHOULD NOT EXCEED 70°C.

E. LEAD FATIGUE: EACH LEAD SHALL BE CAPABLE OF MEETING THE PULL AND BEND TEST, HOWEVER THE SAME LEAD SHALL NOT BE TESTED FOR BOTH. NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

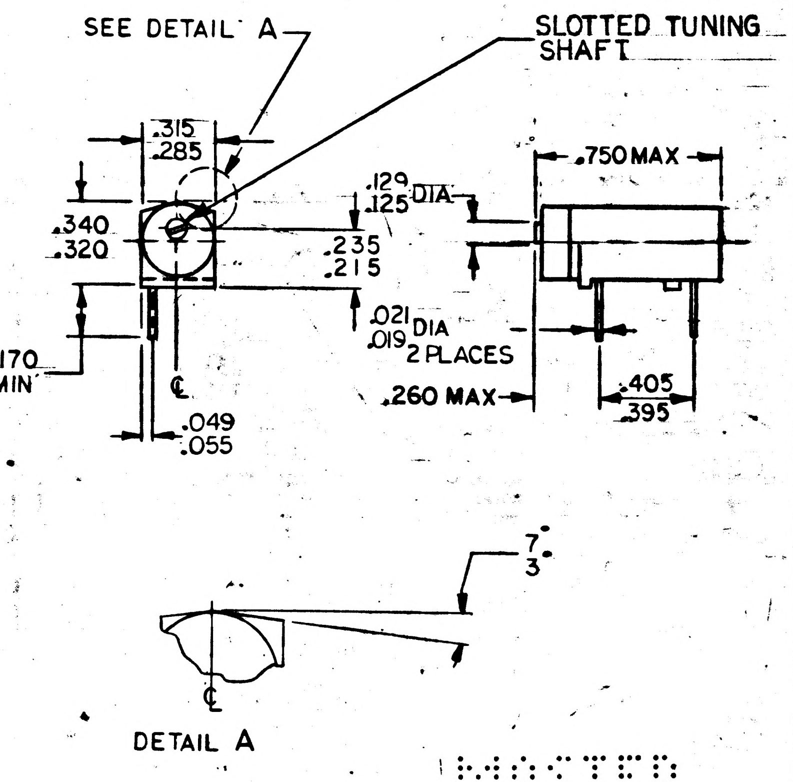
BEND TEST (DISCARD TESTED UNITS): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION.

4. SPECIAL CONDITIONING: EACH LOT SHALL BE TEMPERATURE CYCLED BY THE VENDOR AND TEST DATA SUPPLIED WITH EACH SHIPMENT.

STEP 1 MEASURE AND RECORD THE INDUCTANCE AND Q AT THE MID RANGE VALUE.

STEP 2 PERFORM SIX (6) CYCLES OF 125°C FOR 30 MIN, 25°C FOR 15 MIN, -55°C FOR 30 MIN. AFTER THE 6TH CYCLE PERFORM AN ADDITIONAL 125°C FOR 30 MIN AND THEN WITHIN 2 MIN MEASURE INDUCTANCE AND Q. THE Q SHOULD BE WITHIN SPECIFIED LIMITS AND THE INDUCTANCE SHOULD BE WITHIN 10% OF THE ORIGINAL VALUE. PERFORM THE SEVENTH -55°C CYCLE AND WITHIN 1/2 HOUR THE INDUCTANCE SHOULD BE WITHIN 5% AND THE Q SHOULD BE WITHIN THE SPECIFIED LIMIT.

CAUTION SEE NOTE 2A(3)(c)



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	FMA	10APR65
CHECKED	Tom Adrian #8M	13APR65
APPROVED		
APPROVED	Eldon C Hall	26 May 65
APPROVED MIT	W Kupfer	26 May 65
APPROVED MSC	W Malach	5/26/65
		DATE

COIL, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006324
SCALE NONE		SHEET 1 OF 1

1006324 C

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19689			5-26-65	WK.
A		REVISED PER TDRR 20880			7-20-65	MDM
B		REVISED PER TDRR 21863			9/8/65	WK
C		REVISED PER TDRR 28152			4/14/66	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-15305 TYPE LT4K, GRADE 1, CLASS B AS MODIFIED BY THE REQUIREMENTS OF THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002060 EXCEPT THAT IMMERSION PER MIL-C-15305 SHALL BE METHOD A (NO SALT).

E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE INDUCTANCE VALUE RANGE, DC RESISTANCE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100% UNLESS OTHERWISE SPECIFIED)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) LEAD MATERIAL: WELDABLE, GOLD PLATED IRON-NICKEL ALLOY (DUMET) PER ND 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT. THE EXPOSED PORTION OF THE LEADS SHALL BE FREE OF SOLDER.

(3) TORQUE:

(a) STARTING: 0.1 IN OZ MINIMUM

(b) PREVAILING: 2.5 IN OZ MAXIMUM

(c) MAXIMUM TORQUE: UNIT SHALL BE CAPABLE OF WITHSTANDING 3.5 IN OZ MAX. WITH THE TUNING SLUG AT EITHER STOP. UTMOST CARE SHOULD BE USED NOT TO EXCEED THIS LIMIT.

B. ELECTRICAL CHARACTERISTICS:

(1) INDUCTANCE TUNING RANGE: FROM 8 MICROHENRIES TO 15 MICROHENRIES AT 2.0 MEGACYCLES ± 1% USING A BOONTON 260A Q METER (OR EQUIVALENT) WITH A 420 PF OR 790 PF ± 5% ARCO ELECTRONICS DUR-MICA CAPACITOR (OR EQUIVALENT) IN PARALLEL WITH THE COIL. 420 PF AT 15 UH AND 790 PF AT 8 UH.

(2) Q-FACTOR: 30 MIN AT 8 MICROHENRIES AND 50 MIN AT 15 MICROHENRIES USING THE SAME EQUIPMENT SPECIFIED IN PARAGRAPH 2.B.(1).

(3) DC RESISTANCE: 1.9 OHMS MAX.

(4) RESONANT FREQUENCY: 15 MEGACYCLES MINIMUM.

(5) INDUCTANCE - TEMP COEF: ± 150 PPM/C° FROM 0°C TO +70°C. TEST ONE (1) SAMPLE PER LOT

(6) TEST VOLTAGE: 100 VRMS BETWEEN WINDING AND THE TUNING SLUG WHEN IN THE MAXIMUM INDUCTANCE POSITION.

(7) DISTRIBUTED CAPACITANCE: (TWO (2) FREQUENCY METHOD) 8 PICOFARADS MAXIMUM OVER THE FREQUENCY RANGE OF 8 TO 15 MICROHENRIES

~~[illegible]~~

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:

(1) CERTIFICATE OF COMPLIANCE TO ND 1015404.

(2) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

(3) CERTIFICATE OF COMPLIANCE WITH SPECIAL CONDITIONING.

(4) TEST DATA FROM SPECIAL CONDITIONING.

3. DESIGN:

A. OPERATING LIFE: 2000 HOURS MINIMUM AT MAXIMUM CURRENT AND TEMPERATURE RATINGS. THE ADJUSTMENT SCREW SHALL BE CAPABLE OF 100 CYCLES OF OPERATION. ONE CYCLE EQUALS ADJUSTMENT ALL THE WAY IN AND ALL THE WAY OUT.

B. CONSTRUCTION: PLASTIC CASE WITH AN ALUMINUM (LEAD SCREW) TUNING SHAFT WHICH CONTROLS THE BONDED FERROUS SLUG. THE UNIT SHALL HAVE AN ADEQUATE "O" RING SEAL ON THE TUNING SHAFT TO PREVENT POTTING AND MOISTURE PENETRATION.

C. OPERATING TEMPERATURE RANGE: 0°C TO +70°C.

D. CURRENT RATING (MAXIMUM): 200 MILLIAMPERES. UNDER THIS CONDITION THE TEMPERATURE RISE WILL BE 35°C SO THE AMBIENT SHOULD NOT EXCEED 70°C.

E. LEAD FATIGUE: EACH LEAD SHALL BE CAPABLE OF MEETING THE PULL AND BEND TEST, HOWEVER THE SAME LEAD SHALL NOT BE TESTED FOR BOTH. NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

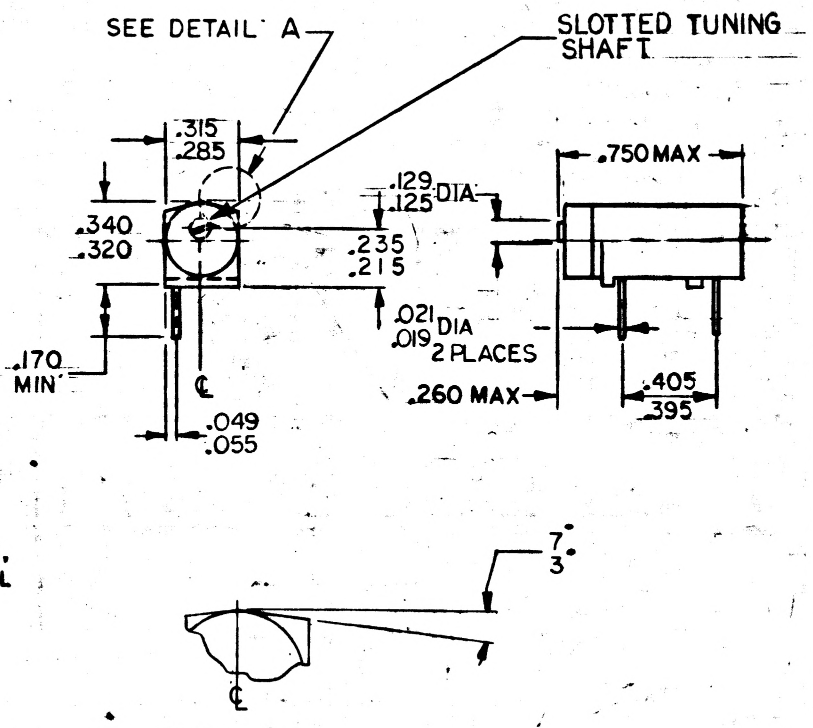
BEND TEST (DISCARD TESTED UNITS): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION.

4. SPECIAL CONDITIONING: EACH LOT SHALL BE TEMPERATURE CYCLED BY THE VENDOR AND TEST DATA SUPPLIED WITH EACH SHIPMENT.

STEP 1 MEASURE AND RECORD THE INDUCTANCE AND Q AT THE MID RANGE VALUE.

STEP 2 PERFORM SIX (6) CYCLES OF 125°C FOR 30 MIN, 25°C FOR 15 MIN, -55°C FOR 30 MIN. AFTER THE 6TH CYCLE PERFORM AN ADDITIONAL 125°C FOR 30 MIN AND THEN WITHIN 2 MIN MEASURE INDUCTANCE AND Q. THE Q SHOULD BE WITHIN SPECIFIED LIMITS AND THE INDUCTANCE SHOULD BE WITHIN 10% OF THE ORIGINAL VALUE. PERFORM THE SEVENTH -55°C CYCLE AND WITHIN 1/2 HOUR THE INDUCTANCE SHOULD BE WITHIN 5% AND THE Q SHOULD BE WITHIN THE SPECIFIED LIMIT.

CAUTION SEE NOTE 2A(3)(c)



DETAIL A

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 10APR65
CHECKED 13APR65
APPROVED
APPROVED Eldon C Hall 26May65
APPROVED MIT W Kupfer 26May65
APPROVED MSC 5/26/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006324
SCALE NONE
SHEET 1 OF 1

1006324 C

4 3 2 1

—	1006324

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19689			5-26-65	WK.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-15305 TYPE LT4K, GRADE 1, CLASS B AS MODIFIED BY THE REQUIREMENTS OF THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS ~~OF ND 1002060~~ EXCEPT THAT IMMERSION PER MIL-C-15305 SHALL BE METHOD A (NO SALT).

E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE INDUCTANCE VALUE RANGE, DC RESISTANCE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100% UNLESS OTHERWISE SPECIFIED)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) LEAD MATERIAL: WELDABLE, GOLD PLATED IRON-NICKEL ALLOY (DUMET) PER ND 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT. THE EXPOSED PORTION OF THE LEADS SHALL BE FREE OF SOLDER.

(3) TORQUE:

(a) STARTING: 0.1 IN OZ MINIMUM

(b) PREVAILING: 2.5 IN OZ MAXIMUM

(c) MAXIMUM TORQUE: UNIT SHALL BE CAPABLE OF WITHSTANDING 3.5 IN OZ MAX. WITH THE TUNING SLUG AT EITHER STOP. UTMOST CARE SHOULD BE USED NOT TO EXCEED THIS LIMIT.

B. ELECTRICAL CHARACTERISTICS:

(1) INDUCTANCE TUNING RANGE: FROM 8 MICROHENRIES TO 15 MICROHENRIES AT 2.0 MEGACYCLES ± 1% USING A BOONTON 260A Q METER (OR EQUIVALENT) WITH A 420 PF OR 790 PF ± 5% ARCO ELECTRONICS DUR-MICA CAPACITOR (OR EQUIVALENT) IN PARALLEL WITH THE COIL. 420 PF AT 8 UH AND 790 PF AT 15 UH.

(2) Q-FACTOR: 50 MIN AT 8 MICROHENRIES AND 80 MIN AT 15 MICROHENRIES USING THE SAME EQUIPMENT SPECIFIED IN PARAGRAPH 2.B.(1).

(3) DC RESISTANCE: 1.9 OHMS MAX.

(4) RESONANT FREQUENCY: 15 MEGACYCLES MINIMUM.

(5) INDUCTANCE - TEMP COEF: ± 150 PPM/C° FROM 0°C TO +70°C.

(6) TEST VOLTAGE: 100 VRMS BETWEEN WINDING AND THE TUNING SLUG WHEN IN THE MAXIMUM INDUCTANCE POSITION.

(7) DISTRIBUTED CAPACITANCE:

7 PICOFARADS ± 1% AT 13 MICROHENRIES

6.6 PICOFARADS ± 1% AT 11 MICROHENRIES

6.1 PICOFARADS ± 1% AT 9 MICROHENRIES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:

(1) CERTIFICATE OF COMPLIANCE TO ND 1015404.

(2) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

(3) CERTIFICATE OF COMPLIANCE WITH SPECIAL CONDITIONING.

(4) TEST DATA FROM SPECIAL CONDITIONING.

3. DESIGN:

A. OPERATING LIFE: 2000 HOURS MINIMUM AT MAXIMUM CURRENT AND TEMPERATURE RATINGS. THE ADJUSTMENT SCREW SHALL BE CAPABLE OF 100 CYCLES OF OPERATION. ONE CYCLE EQUALS ADJUSTMENT ALL THE WAY IN AND ALL THE WAY OUT.

B. CONSTRUCTION: PLASTIC CASE WITH AN ALUMINUM (LEAD SCREW) TUNING SHAFT WHICH CONTROLS THE BONDED FERROUS SLUG. THE UNIT SHALL HAVE AN ADEQUATE "O" RING SEAL ON THE TUNING SHAFT TO PREVENT POTTING AND MOISTURE PENETRATION.

C. OPERATING TEMPERATURE RANGE: 0°C TO +70°C.

D. CURRENT RATING (MAXIMUM): 450 MILLIAMPERES. UNDER THIS CONDITION THE TEMPERATURE RISE WILL BE 35°C SO THE AMBIENT SHOULD NOT EXCEED 70°C.

E. LEAD FATIGUE: EACH LEAD SHALL BE CAPABLE OF MEETING THE PULL AND BEND TEST, HOWEVER THE SAME LEAD SHALL NOT BE TESTED FOR BOTH. NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

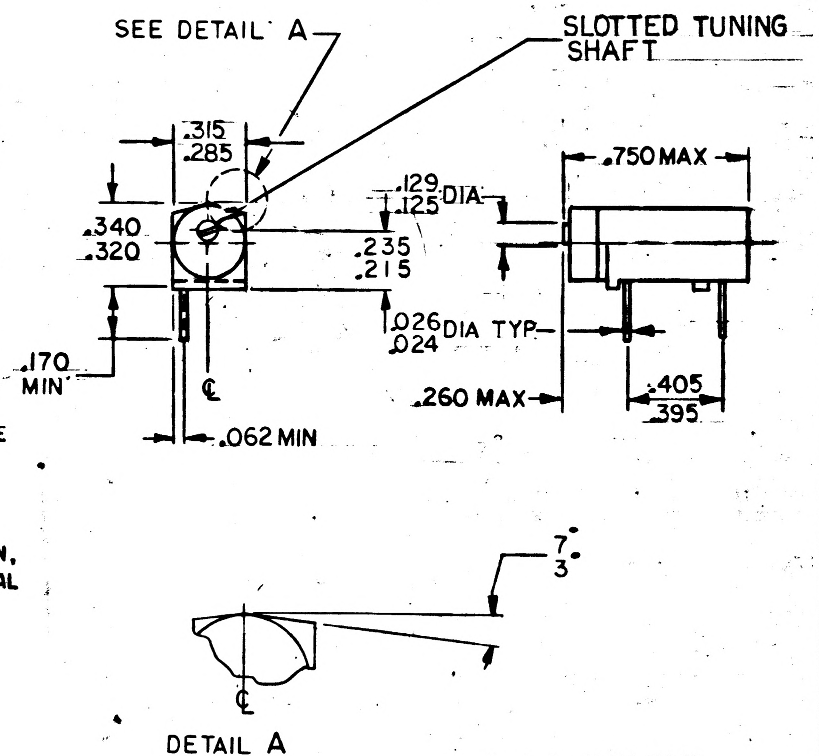
BEND TEST (DISCARD TESTED UNITS): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION.

4. SPECIAL CONDITIONING: EACH LOT SHALL BE TEMPERATURE CYCLED BY THE VENDOR AND TEST DATA SUPPLIED WITH EACH SHIPMENT.

STEP 1 MEASURE AND RECORD THE INDUCTANCE AND Q AT THE MID RANGE VALUE.

STEP 2 PERFORM SIX (6) CYCLES OF 125°C FOR 30 MIN, 25°C FOR 15 MIN, -55°C FOR 30 MIN. AFTER THE 6TH CYCLE PERFORM AN ADDITIONAL 125°C FOR 30 MIN AND THEN WITHIN 2 MIN MEASURE INDUCTANCE AND Q. THE Q SHOULD BE WITHIN SPECIFIED LIMITS AND THE INDUCTANCE SHOULD BE WITHIN 10% OF THE ORIGINAL VALUE. PERFORM THE SEVENTH -55°C CYCLE AND WITHIN 1/2 HOUR THE INDUCTANCE SHOULD BE WITHIN 5% AND THE Q SHOULD BE WITHIN THE SPECIFIED LIMIT.

CAUTION SEE NOTE 2A(3)(c)



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN FWB 10APR65
CHECKED Tom Adrian 78M 13APR65
APPROVED
APPROVED Eldon C Hall 26 May 65
APPROVED MIT W Kupfer
APPROVED MSC 5/26/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
DRAWING NO. 1006324
SCALE NONE
SHEET 1 OF 1

4 3 2 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006325

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 18236			4-13-65	LK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27, GRADE 5, CLASS S, EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.

E. PART MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, SERIAL NUMBER, TERMINAL IDENTIFICATION, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100% UNLESS OTHERWISE SPECIFIED).

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) MARKING: AS SPECIFIED FOR PART MARKING.

B. ELECTRICAL CHARACTERISTICS:

(1) STANDARD TEST CONDITIONS:

INPUT VOLTAGE (ACROSS LEADS 1 & 3): 35 VRMS ± 2%, 800 ± 8 CPS SINE WAVE WITH 1.0% MAXIMUM HARMONIC DISTORTION.

NO LOAD ACROSS LEADS 4 & 5 AND NO CONTROL CURRENT THRU LEADS 6 & 7.

(2) PRIMARY (LEADS 1 AND 3, CENTERTAPPED AT 2):

(a) PARALLEL INDUCTANCE (STANDARD TEST CONDITION): 500 MILLIHENRIES MINIMUM.

(b) PARALLEL INDUCTANCE (STANDARD TEST COND. + 5 MADC THRU LEADS 6 & 7): 100 MILLIHENRIES ± 20%.

(c) CENTERTAP BALANCE (STANDARD TEST CONDITION): VOLTAGES MEASURED FROM CENTERTAP TO EITHER END SHALL BE SUCH THAT THE SMALLER SHALL BE NO LESS THAN 98% OF THE LARGER.

(d) DC RESISTANCE (1-3): 2.4 OHMS MAXIMUM.

(3) SECONDARY (LEADS 4 AND 5):

(a) VOLTAGE: 275 VRMS ± 5% (STANDARD TEST CONDITIONS)

(b) DC RESISTANCE: 200 OHMS MAXIMUM.

(4) CONTROL WINDING (LEADS 6 AND 7):

(a) VOLTAGE: 100 MVRMS MAXIMUM (STANDARD TEST CONDITIONS)

(b) DC RESISTANCE: 400 OHMS MAXIMUM.

(5) DIELECTRIC WITHSTANDING VOLTAGE: 1275 VRMS ON SECONDARY WINDING (4-5), 500 VRMS ON ALL OTHERS PER MIL-T-27

(6) CORE LOSS: 0.7 WATTS MAXIMUM (STANDARD TEST CONDITIONS)

(7) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION :

(1) CERTIFIED TEST DATA FOR BURN-IN REQUIREMENT (NOTE 4).

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(3) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

3. DESIGN:

A. OPERATING LIFE: UNITS SHALL BE CAPABLE OF CONTINUOUS UNINTERRUPTED OPERATION AS SPECIFIED HEREIN FOR 2000 HOURS.

B. CONSTRUCTION:

(1) CASE: UNIT SHALL BE ENCAPSULATED WITH A MINIMUM POTTING COVERAGE OF 0.031 INCH OVER CORE AND WINDINGS.

(2) LEAD MATERIAL: WELDABLE, UNCOATED, ANNEALED NICKEL PER ND 1015400.

(3) LEAD STRENGTH: EACH LEAD SHALL BE CAPABLE OF MEETING THE FOLLOWING TESTS - HOWEVER THE SAME LEAD WILL NOT BE TESTED FOR BOTH. NO MECHANICAL DAMAGE TO ENCAPSULANT OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER TESTING.

LEAD PULL: 4 POUND MINIMUM AXIAL PULL APPLIED WITHOUT SHOCK.

LEAD FATIGUE (BEND); DISCARD TESTED UNITS: HOLD UNIT IN SUCH A MANNER THAT A 2 POUND WEIGHT CAN BE SUSPENDED FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE UNIT BODY, WHILE IN A PLANE, THROUGH A 90° ARC IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION, AND THEN BACK 90° TO THE ORIGINAL POSITION.

(4) INTERNAL WIRE: MAGNET WIRE SHALL BE 0.0025 DIA (NO. 42 AWG) MINIMUM.

4. SPECIAL CONDITIONING: ALL UNITS SHALL BE BURNED IN BY SUPPLIER (SEE TEST CIRCUIT - FIG. 1) AND CERTIFIED TEST DATA SUPPLIED WITH EACH SHIPMENT.

A. OPERATING CONDITIONS: OPERATE THE UNIT AT 85°C AMBIENT FOR 50 HOURS IN THE BURN-IN TEST CIRCUIT (FIG. 1).

B. MEASUREMENTS: INDUCTANCE AND DC RESISTANCE SHALL BE MEASURED (AND RECORDED) BEFORE AND AFTER BURN-IN AT (25°C) ROOM TEMPERATURE.

C. REJECTION: ANY UNIT THAT CHANGES MORE THAN 5% BETWEEN INITIAL AND FINAL MEASUREMENT SHALL NOT BE SHIPPED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN J.P. Leonard 17FEB65
CHECKED J. Wolkowitz 18FEB65
APPROVED
APPROVED Eldon C Hall 9 Apr 65
APPROVED MIT W Kupfer 13 Apr 65
APPROVED MSC W J Rhine 4-13-65
DATE

SATURABLE REACTOR

SPECIFICATION CONTROL DRAWING

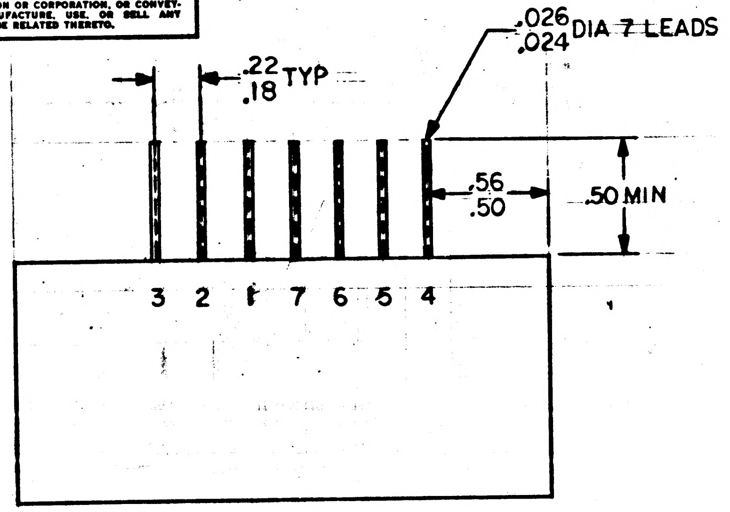
CODE IDENT NO. ——
SIZE C
DRAWING NO. 1006325
SCALE NONE
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006325

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 19236			4-13-65	CK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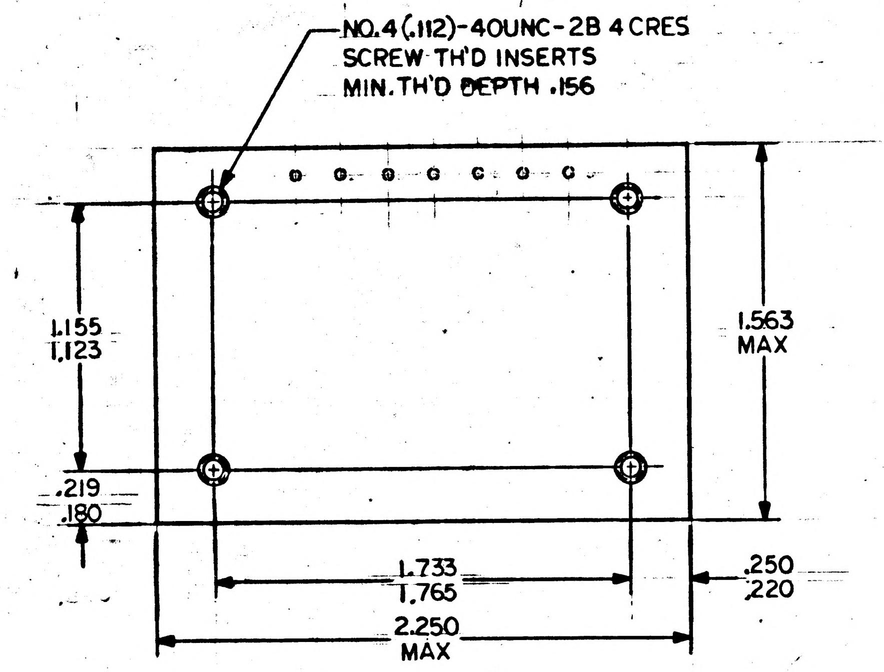
.024 DIA 7 LEADS
.22
.18 TYP
.56
.50
.50 MIN
3 2 1 7 6 5 4


NO.4(.112)-40UNC-2B 4 CRES
SCREW TH'D INSERTS
MIN. TH'D DEPTH .156
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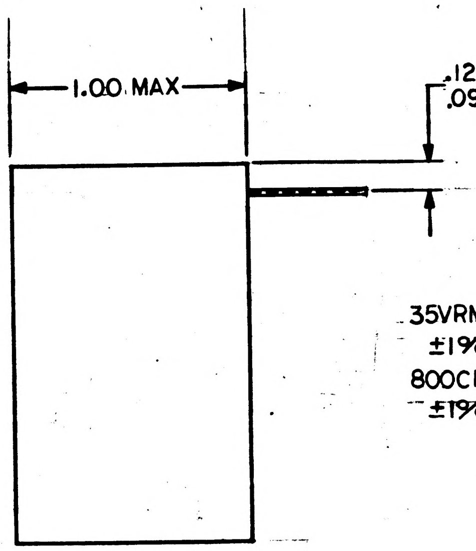
1.123
.219
.180
1.733
1.765
2.250
MAX
.250
.220
1.563
MAX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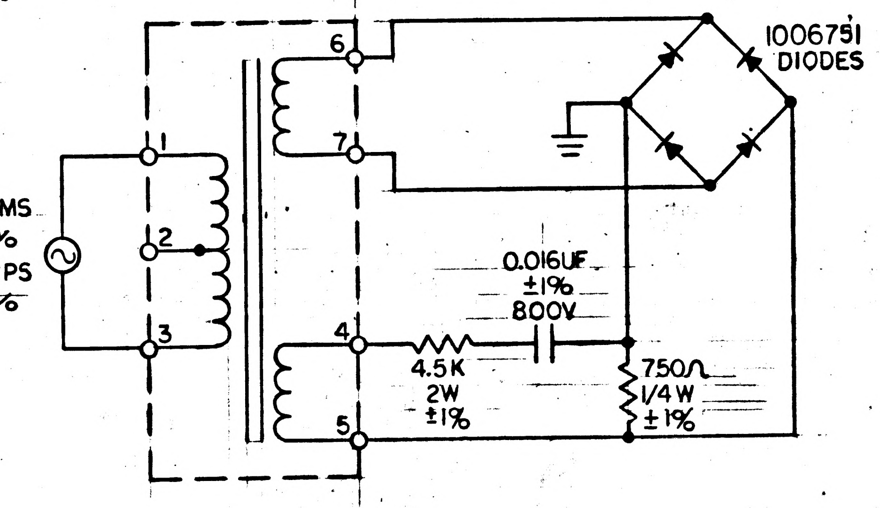

35VRMS
±1%
800CPS
±1%
1
2
3
4
5
6
7
1006751
DIODES
0.016UF
±1%
800V
4.5K
2W
±1%
750Ω
1/4W
±1%

FIG. 1 - BURN IN CIRCUIT

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	J. J. Leonard	17FEB65
CHECKED	[illegible]	18FEB65
APPROVED		
APPROVED	Eldon C Hall	9 April 65
APPROVED MIT	W [illegible]	13 Apr 65
APPROVED MSC	W J Rhine	4-13-65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SATURABLE REACTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
DRAWING NO. 1006325
SCALE NONE
SHEET 2 OF 2

1006328

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 18120			6Apr65	GK

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27, GRADE 5, CLASS S EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.

   E. PART MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, INDUCTANCE VALUE, DC RESISTANCE, LOT CODE, SERIAL NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

   F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100% UNLESS OTHERWISE SPECIFIED):

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED FOR PART MARKING.

   B. ELECTRICAL CHARACTERISTICS:

      (1) INDUCTANCE: 80 MICROHENRIES ± 15% AT 7.0 AMPERES DC ± 10%. TEST FREQUENCY IS 50 KC ± 1% AT 5 VRMS ± 10%.

      (2) DC RESISTANCE: 0.022OHMS MAXIMUM.

      (3) DIELECTRIC WITHSTANDING VOLTAGE: 500 VRMS BETWEEN THE WINDING AND ANY SURFACE (RESTING ON A METAL PLATE) NOT HAVING LEADS.

      (4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC. BETWEEN THE WINDING AND ANY SURFACE (RESTING ON A METAL PLATE) NOT HAVING LEADS.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

      (2) CERTIFIED TEST DATA FOR BURN-IN REQUIREMENT (NOTE 4).

3. DESIGN:

   . CONSTRUCTION:

      (1) CASE: UNIT SHALL BE ENCAPSULATED WITH A MINIMUM POTTING COVERAGE OF 0.031 INCH OVER CORE AND WINDING.

      (2) LEAD MATERIAL: ANNEALED TINNED COPPER WIRE.

      (3) LEAD PULL: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING (WITHOUT MECHANICAL DAMAGE OR LACK OF PERFORMANCE) A 4 POUND MINIMUM AXIAL PULL, APPLIED WITHOUT SHOCK.

      (4) INTERNAL WIRE: MAGNET WIRE SHALL BE 0.0028 DIA (NO. 41 AWG) MINIMUM.

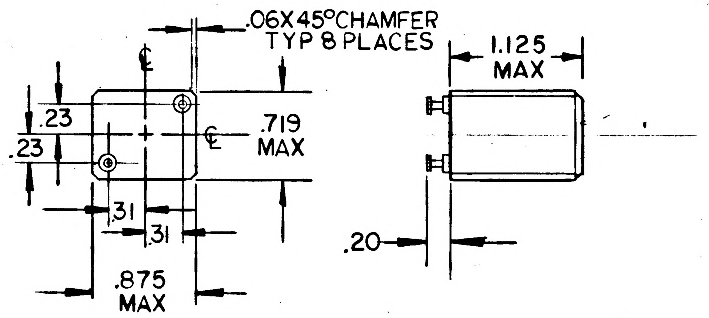
   [illegible]

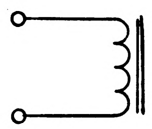
4. SPECIAL CONDITIONING: ALL UNITS SHALL BE BURNED IN BY THE SUPPLIER AND CERTIFIED TEST DATA SUPPLIED WITH EACH SHIPMENT.

   A. OPERATING CONDITIONS: OPERATE THE UNIT AT 85°C AMBIENT FOR 50 HOURS WITH 7.0 AMPERES DC FLOWING.

   B. MEASUREMENTS: INDUCTANCE AND DC RESISTANCE SHALL BE MEASURED (AND RECORDED) BEFORE AND WITHIN 4 HOURS AFTER BURN-IN AT (25°C) ROOM TEMPERATURE.

   C. REJECTION: ANY UNIT THAT EXCEEDS TOLERANCE SPECIFIED HEREIN, OR CHANGES MORE THAN 5% BETWEEN INITIAL AND FINAL MEASUREMENTS, SHALL NOT BE SHIPPED.




ELECTRICAL SCHEMATIC

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS XX±01 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	C. Mazza	17FEB65
CHECKED	J. Wolfrom	17FEB65
APPROVED	M. McGinity	6APR65
APPROVED	Eldon C. Hall	6Apr65
APPROVED MIT	W. Kupfer	6Apr65
APPROVED MSC	W. J. Blair	4-6-65
		DATE

INDUCTOR,
80uh
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
—	C	1006328

SCALE NONE
SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE CLASS A PER TDRR 17476	18Mar65	WR
A	REVISED PER TDRR 21591	9/8/65	WR

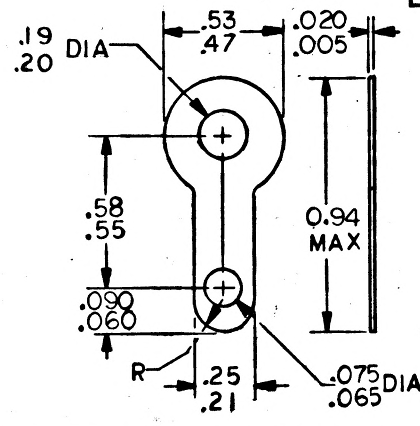
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.
   - D. THE PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002054
   - E. PART MARKING: UNITS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, LOT CODE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). POLARITY SHALL ALSO BE MARKED.
   - F. PREPARATION FOR DELIVERY: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS. PACKAGE MARKING SHALL BE IN ACCORDANCE WITH ND 1002215.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) TERMINAL: LEAD SHALL BE ALLOY NO. 52 SOLDER DIPPED.
     - (3) MARKING: AS SPECIFIED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) REVERSE CURRENT (I_R)
     - (2) FORWARD VOLTAGE (V_F)
     - (3) RECOVERY TIME (T_{RR})
     - (4) REVERSE BREAKDOWN (PIV)
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:
     - (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

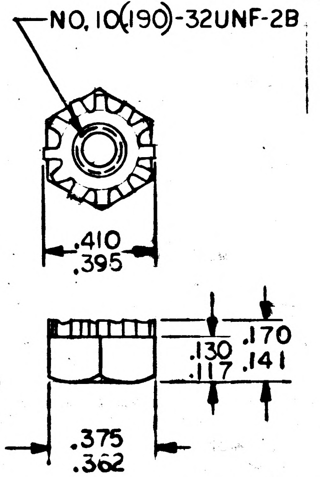
3. DESIGN REQUIREMENTS:
   - A. ELECTRICAL RATINGS AT 25°C.
     - (1) MAXIMUM RMS VOLTAGE (V_{AC}): 140 VOLTS (INTO RESISTIVE LOAD).
     - (2) MAXIMUM AVERAGE FORWARD CURRENT: 14 AMPERES.
     - (3) MAXIMUM FORWARD SURGE CURRENT: 150 AMPS, 1/2 CYCLE, 60 CPS, OPERATING AT CASE TEMPERATURE (T_C) 100°C.
   - B. TEMPERATURE RATINGS:
     - (1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.
     - (2) STORAGE TEMPERATURE: -65°C TO +175°C.
     - (3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT
   - C. CONSTRUCTION:
     - (1) SEMICONDUCTOR MATERIAL: SILICON.
     - (2) CASE MATERIAL: NICKEL PLATED STEEL.
     - (3) STUD MATERIAL: NICKEL PLATED COPPER ALLOY.
     - (4) STUD TORQUE: SHALL BE CAPABLE OF 30 INCH-POUNDS MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



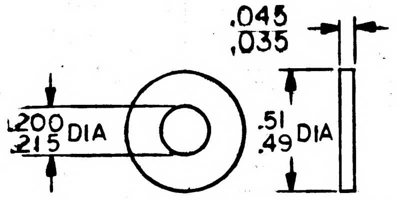
MATL: BERYLLIUM COPPER, SILVER PLATED

SOLDER-LUG



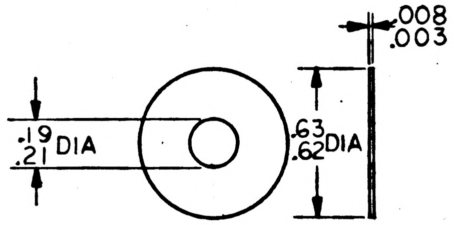
MATL: BRASS, NICKEL PLATED

LOCK NUT



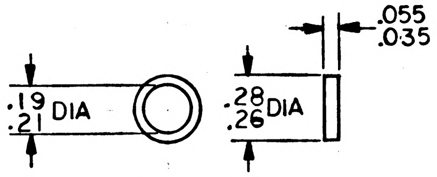
MATL: BRASS, NICKEL PLATED

WASHER



MATL: MICA

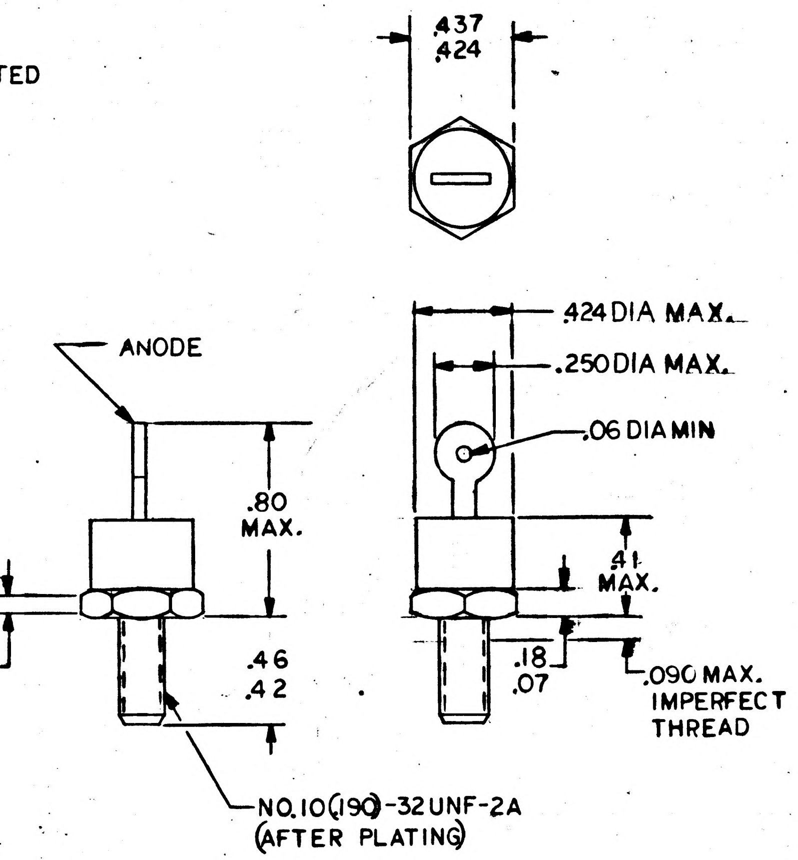
INSULATING WASHER
2 REQ'D



MATL: TEFLON

INSULATING SPACER

MASTER



PACKAGE REF DO-4

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
CONTRACT NO.
DRAWN B Kal... DATE 11FEB65
CHECKED Alegri 11Feb65
APPROVAL
APPROVAL Eldon C Hall 18Mar65
APPROVAL
NASA APPROVAL 3/17/65
MIT APPROVAL W Guyer 18Mar65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, RECTIFIER,
POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006329
SCALE NONE	WT	SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006329 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
–	INITIAL RELEASE CLASS A PER TDRR 17476	18Mar65	WK
A	REVISED PER TDRR 21591	9/8/65	WK

TABLE I - ELECTRICAL CHARACTERISTICS

PARAMETER	MIL-STD-750 TEST CONDITIONS T_C = 25° ± 3°C UNLESS SPECIFIED	SYMBOL	LIMITS		UNIT
			MIN	MAX	
REVERSE VOLTAGE, PEAK	I_R = 10 MA	V_R	200	-	VOLTS
REVERSE CURRENT	V_R = 30 VDC, T_C = 100°C	I_R	-	10	MA
FORWARD VOLTAGE	I_F = 14 ADC	V_F	-	1.3	VDC
	I_F = 7 ADC	V_F	-	1.0	VDC
RECOVERY TIME, REVERSE	FROM I_F = 1.0 A TO V_R = 30 VDC SEE FIGURE 2	t_{rr}	-	160	NANO-SEC

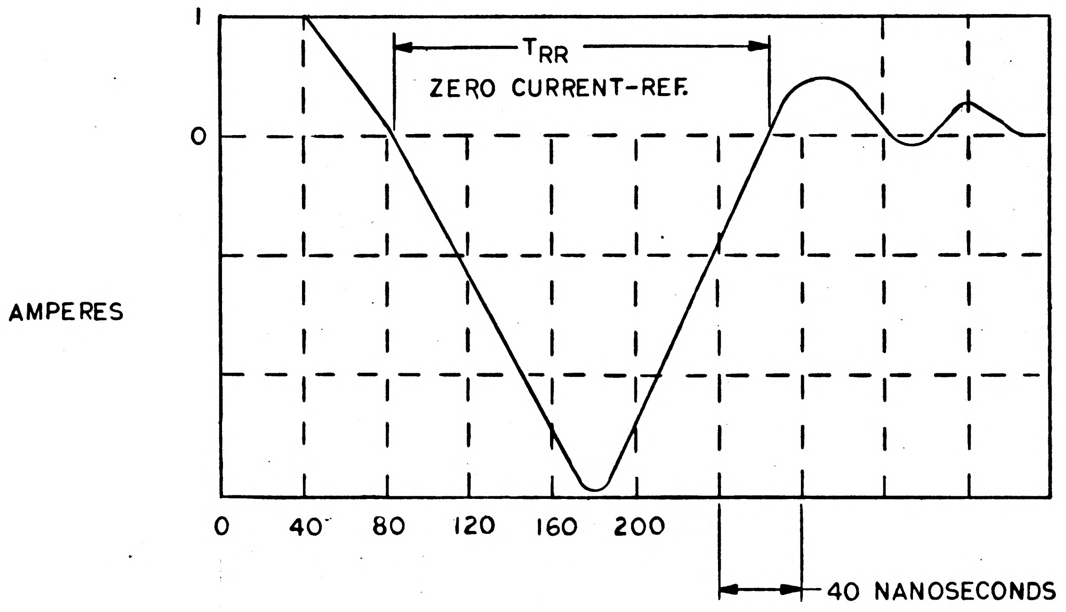


FIG. I TYPICAL RECOVERY PATTERN

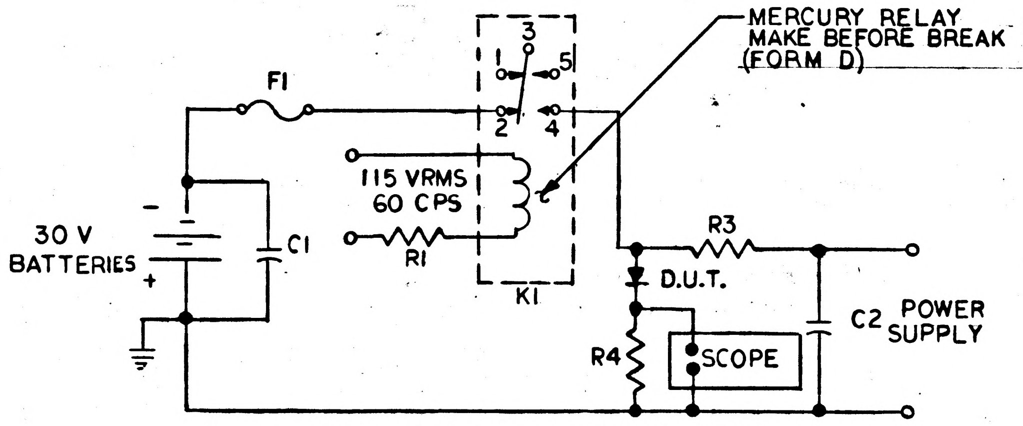


FIG.2 RECOVERY TIME TEST CIRCUIT

BATTERIES - 5 BURGESS 4F44 (6 VOLT) SERIES
C1, C2 - 1 UF ± 10% 300 VDC OIL FILLED
R1 - 10 K 2 W 5%
R3 - 30 OHM 30 WATTS 10% CARBON FILM NON-INDUCTIVE
R4 - 1 OHM 10 W 1% NON-INDUCTIVE
K1 - HGP-1002 CLARE
F1 - SLO-BLO-1 AMP
SCOPE - TEXTRONIX 541 OR 545 WITH 53/54 K PREAMPLIFIER;
P-6000 1:10 ISOLATION PROBE OR EQUIVALENT.
POWER SUPPLY - 35 VOLTS AT 1.0 AMPERS MINIMUM, RIPPLE 3 MILLIVOLTS OR LESS, OUTPUT IMPEDANCE 1/2 OHM MAXIMUM, DC TO 2000 CPS.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
CONTRACT NO.
DRAWN B Katsul DATE 11 FEB65
CHECKED 11 feb 65
APPROVAL
APPROVAL Eldon C Hall 11 Mar 65
APPROVAL
NASA APPROVAL 3/11/65
MIT APPROVAL 18 Mar 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, RECTIFIER,
POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006329
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

– 1006329

SYM	DESCRIPTION	DATE	APPROVED
–	INITIAL RELEASE CLASS A PER TDRR 17476	18Mar65	WK

REQUIREMENTS:

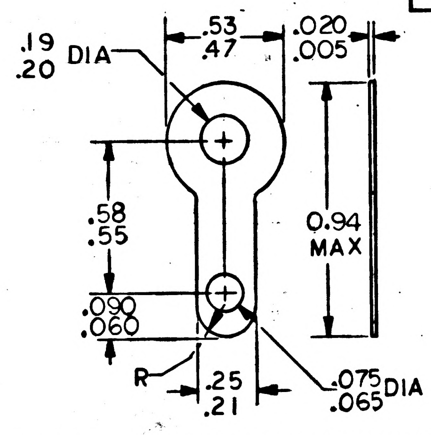
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.
   - D. THE PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - E. PART MARKING: UNITS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, LOT CODE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). POLARITY SHALL ALSO BE MARKED.
   - F. PREPARATION FOR DELIVERY: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS. PACKAGE MARKING SHALL BE IN ACCORDANCE WITH ND 1002215.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) TERMINAL: LEAD SHALL BE ALLOY NO. 52 SOLDER DIPPED.
     - (3) MARKING: AS SPECIFIED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) REVERSE CURRENT (I_R)
     - (2) FORWARD VOLTAGE (V_F)
     - (3) RECOVERY TIME (T_{RR})
     - (4) MAXIMUM OVERSHOOT (I_{OS})
     - (5) REVERSE BREAKDOWN (PIV)
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:
     - (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

3. DESIGN REQUIREMENTS:
   - A. ELECTRICAL RATINGS AT 25°C.
     - (1) MAXIMUM RMS VOLTAGE (V_{AC}): 140 VOLTS (INTO RESISTIVE LOAD).
     - (2) MAXIMUM AVERAGE FORWARD CURRENT: 14 AMPERES.
     - (3) MAXIMUM FORWARD SURGE CURRENT: 150 AMPS, 1/2 CYCLE, 60 CPS, OPERATING AT CASE TEMPERATURE (T_C) 100°C.
   - B. TEMPERATURE RATINGS:
     - (1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.
     - (2) STORAGE TEMPERATURE: -65°C TO +175°C.
     - (3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT
   - C. CONSTRUCTION:
     - (1) SEMICONDUCTOR MATERIAL: SILICON.
     - (2) CASE MATERIAL: NICKEL PLATED STEEL.
     - (3) STUD MATERIAL: NICKEL PLATED COPPER ALLOY.
     - (4) STUD TORQUE: SHALL BE CAPABLE OF 30 INCH-POUNDS MAXIMUM.

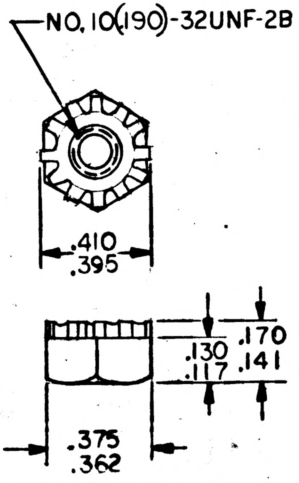
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



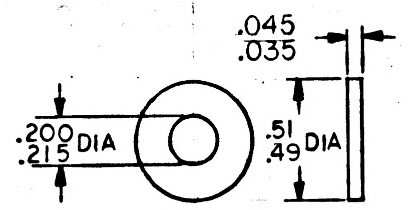
MATL: BERYLLIUM COPPER, SILVER PLATED

SOLDER-LUG



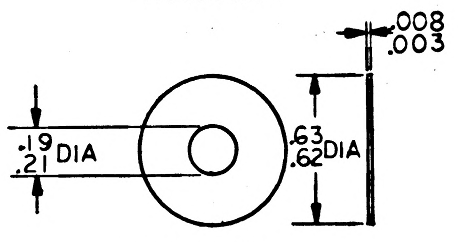
MATL: BRASS, NICKEL PLATED

LOCK NUT



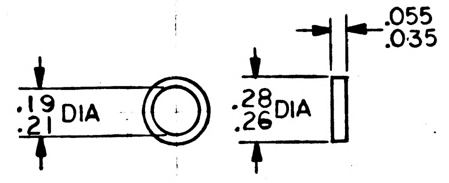
MATL: BRASS, NICKEL PLATED

WASHER



MATL: MICA

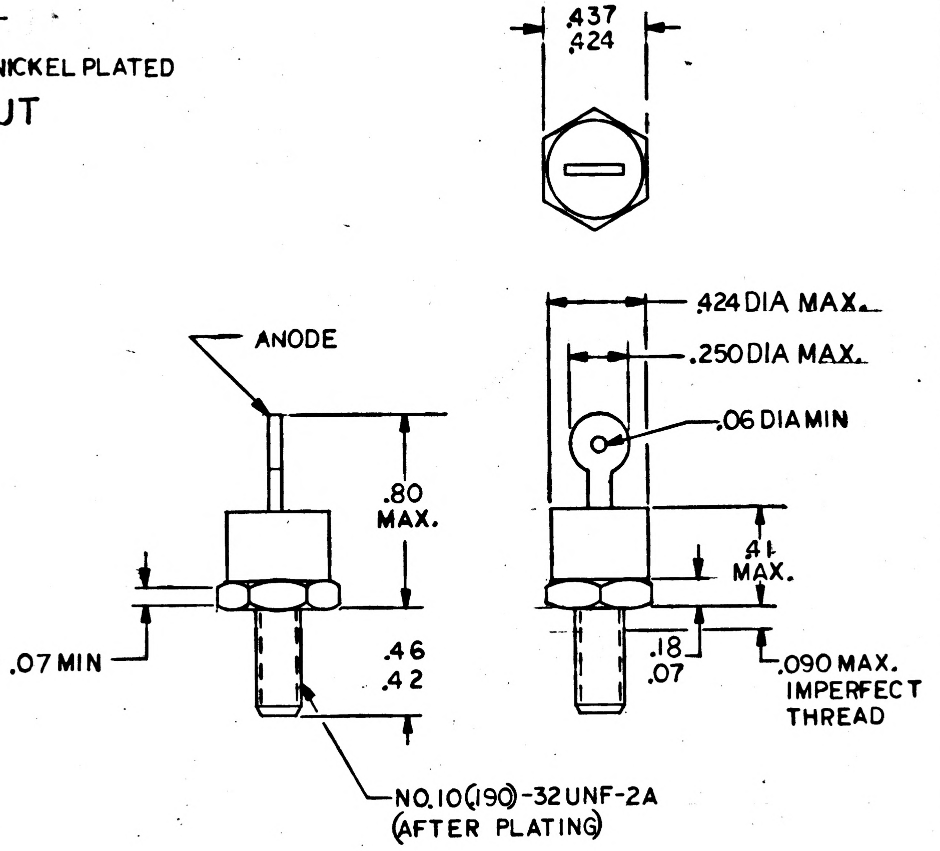
INSULATING WASHER
2 REQ'D



MATL: TEFLON

INSULATING SPACER

MASTER



PACKAGE REF DO-4

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
CONTRACT NO.
DRAWN B Kalynch DATE 11FEB65
CHECKED [illegible] 11 Feb 65
APPROVAL
APPROVAL Eldon C Hall 18 Mar 65
APPROVAL
NASA APPROVAL [illegible] 3/1/65
MIT APPROVAL [illegible] 18 Mar 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, RECTIFIER, POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006329
SCALE NONE
WT
SHEET 1 OF 2

—	1006329

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE CLASS A PER TDRR 17476	18 Mar 65	WR

TABLE I - ELECTRICAL CHARACTERISTICS

PARAMETER	MIL-STD-750 TEST CONDITIONS $T_C = 25° \pm 3°C$ UNLESS SPECIFIED	SYMBOL	LIMITS		UNIT
			MIN	MAX	
REVERSE VOLTAGE, PEAK	I_R = 10 MA	V_R	200	-	VOLTS
REVERSE CURRENT	V_R = 30 VDC, T_C = 100°C	I_R	-	10	MA
FORWARD VOLTAGE	I_F = 14 ADC	V_F	-	1.3	VDC
	I_F = 7 ADC	V_F	-	1.0	VDC
RECOVERY TIME, REVERSE	FROM I_F = 1.0 A TO V_R = 30 VDC SEE FIGURE 2	t_{rr}	-	200	NANO-SEC
PEAK OVERSHOOT	AS MEASURED DURING t_{rr} TEST	I_{OS}	-	3	A

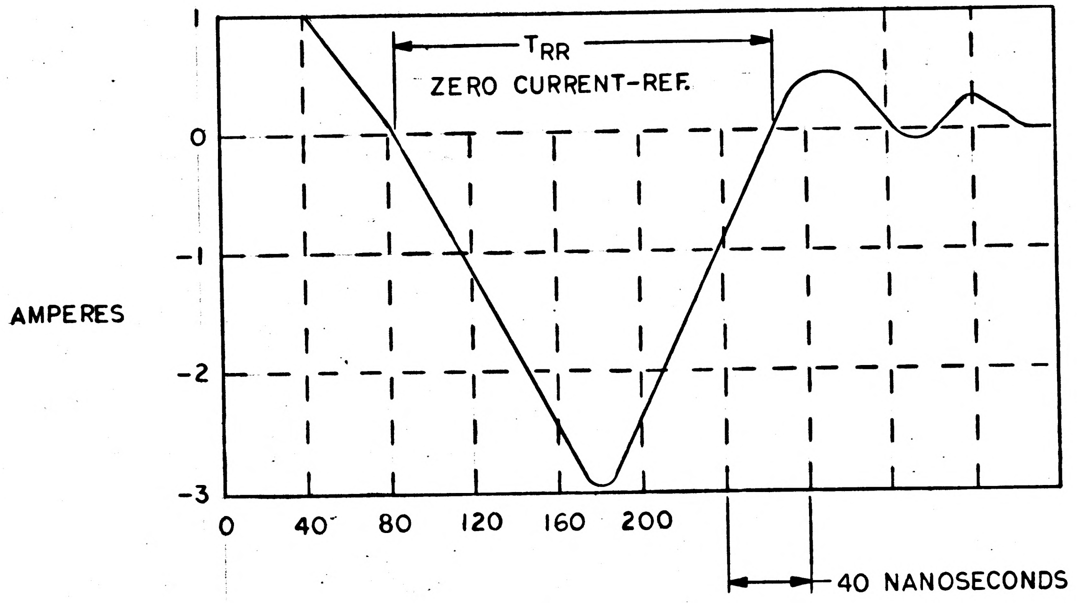


FIG. 1 TYPICAL RECOVERY PATTERN

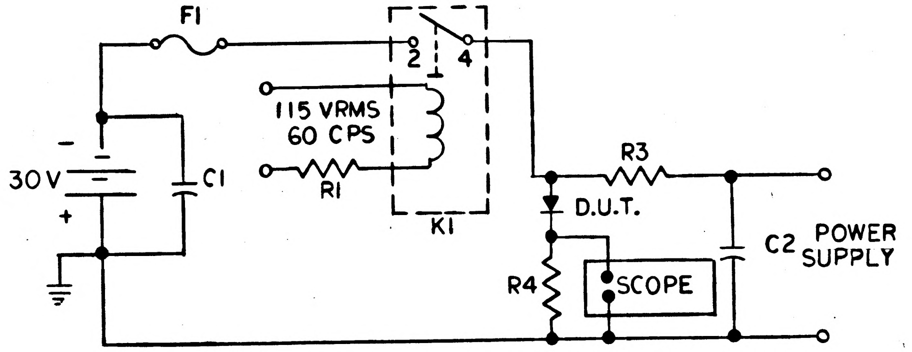


FIG.2 RECOVERY TIME TEST CIRCUIT

BATTERIES - 5 BURGESS 4F4H (6 VOLT) SERIES
C1, C2 - 1 UF ± 10% 300 VDC OIL FILLED
R1 - 10 K 2 W 5%
R3 - 30 OHM 30 WATTS 10% CARBON FILM NON-INDUCTIVE
R4 - 1 OHM 10 W 1% NON-INDUCTIVE
K1 - HGP-1002 CLARE
F1 - SLO-BLO-1 AMP
SCOPE - TEXTRONIX 541 OR 545 WITH 53/54 K PREAMPLIFIER;
P-6000 1:10 ISOLATION PROBE OR EQUIVALENT.
POWER SUPPLY - 35 VOLTS AT 1.0 AMPERS MINIMUM, RIPPLE 3 MILLIVOLTS OR LESS, OUTPUT IMPEDANCE 1/2 OHM MAXIMUM, DC TO 2000 CPS.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
CONTRACT NO.
DRAWN B Katsulis DATE 11 FEB 65
CHECKED [illegible] 11 Feb 65
APPROVAL
APPROVAL Eldon C Hall 11 Mar 65
APPROVAL
NASA APPROVAL W Michael 3/11/65
MIT APPROVAL W Kupfer 18 Mar 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, RECTIFIER,
POWER-FAST SWITCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006329
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	1006330

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 18487			4-21-65	

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. RESISTORS SHALL MEET THE REQUIREMENTS OF MIL-R-23379 TYPE RWP22, CHARACTERISTIC F WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. RESISTORS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.

E. MARKING: RESISTORS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER), RESISTANCE VALUE, TOLERANCE, POWER RATING ~~[illegible]~~

F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 2.

(1) SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. ELECTRICAL CHARACTERISTICS:

(1) RESISTANCE AND TOLERANCE AS SPECIFIED IN TABULATION.

(2) TEMPERATURE COEFFICIENT: ±100 PARTS PER MILLION PER DEGREE CENTIGRADE OVER THE RANGE FROM MINUS 65°C TO PLUS 275°C.

B. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING DOCUMENTATION WITH EACH SHIPMENT.

(1) A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS OF THIS DRAWING.

(2) DATA REQUIREMENTS OF PARAGRAPH 4 SPECIFIED HEREIN.

(3) CERTIFICATES OF COMPLIANCE SHALL CONTAIN THE FOLLOWING INFORMATION PURCHASE ORDER NUMBER, PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER) QUANTITY AND DATE OF SHIPMENT.

3. DESIGN:

A. LEAD MATERIAL: TINNED COPPER. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

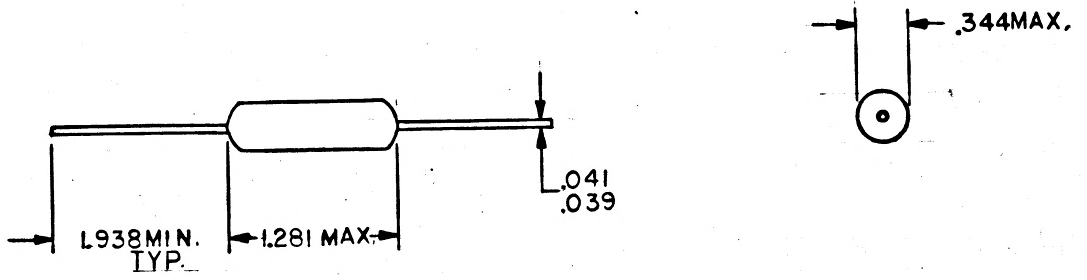
B. POWER RATING: 10 WATTS AT 25°C DERATED LINEARLY TO ZERO AT 275°C.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. TEMPERATURE CYCLING:
RESISTORS SHALL BE TEMPERATURE CYCLED PER MIL-STD-202, METHOD 102 CONDITION C. RESISTANCE SHALL BE MEASURED AT 25°C BEFORE TEMPERATURE CYCLING. RESISTANCE SHALL BE MEASURED AT 25°C NOT LESS THAN ONE HOUR BUT WITHIN A 24 HOUR PERIOD AFTER THE LAST CYCLE. RESISTORS SHALL SHOW NO EVIDENCE OF MECHANICAL DAMAGE, NOR SHALL THERE BE ANY EVIDENCE OF CHANGE IN RESISTOR COATING, ENCLOSURE OR OTHER PARTS WHICH WILL RESULT IN DEGRADATION OF PERFORMANCE. AS A RESULT OF THIS TEST THERE SHALL BE NO CHANGE IN RESISTANCE IN EXCESS OF 0.5 PERCENT PLUS 0.05 OHM.

B. BURN IN:
RESISTORS SHALL BE BURNED IN AT 25°C FOR 100 HOURS AT RATED POWER BY THE MANUFACTURER PRIOR TO SHIPMENT. RESISTANCE SHALL BE MEASURED AT 25°C BEFORE BURN IN. RESISTANCE SHALL BE MEASURED AT 25°C NOT LESS THAN ONE HOUR BUT WITHIN A 24 HOUR PERIOD AFTER BURN IN. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.5% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED.

C. DATA REQUIREMENTS: THE VENDOR MUST FURNISH THE FOLLOWING DATA WITH EACH SHIPMENT FOR EACH RESISTOR: RESISTANCE MEASUREMENTS, DATA CONCERNING ANY CATASTROPHIC FAILURE OCCURRING DURING CONDITIONING, NUMBER BURNED IN, NUMBER OF FAILURES INCLUDING APPROXIMATE HOURS BEFORE FAILING AND INDICATION OF TYPE OF FAILURE



DASH NO.	RESISTANCE OHMS	TOLERANCE
-001	0.120	± 1%

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN BKatula 11FEB65
CHECKED Seger 11Feb65
APPROVED
APPROVED Ellen C Hall 15Apr65
APPROVED MIT WKupfer 21Apr65
APPROVED NASA 4-21-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED, WIREWOUND PRECISION, POWERTYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006330
SCALE NONE
SHEET 1 OF 1

— 1006332

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 18486			4-21-65	

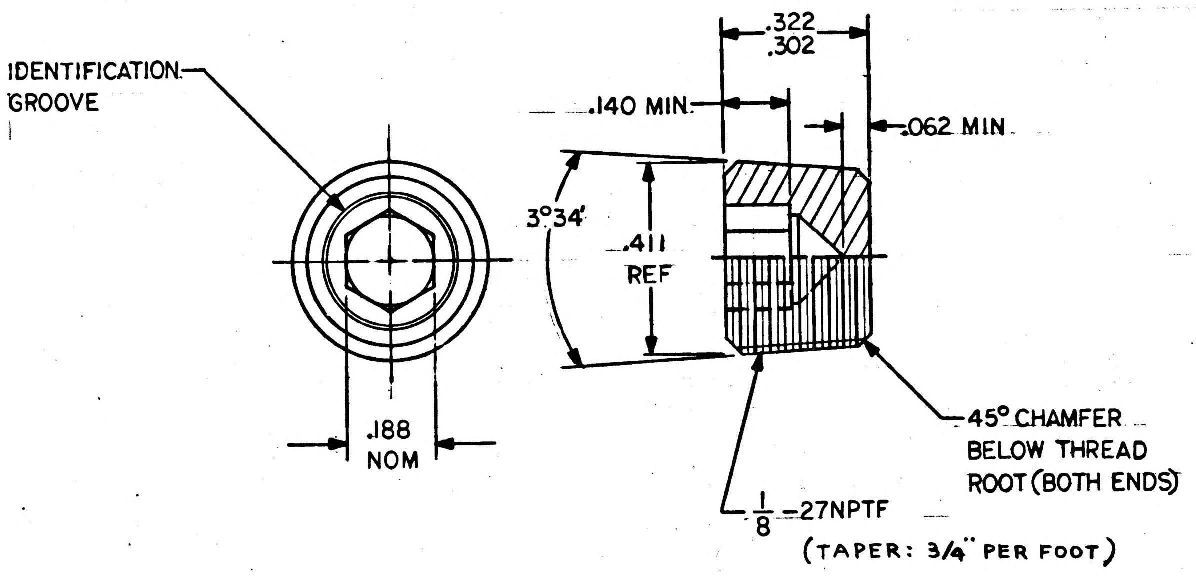
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.
   - C. PREPARATION FOR DELIVERY: PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 7.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. DIMENSIONS AND TOLERANCES AS SPECIFIED HEREIN.
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH THE MATERIAL REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:
   - A. MATERIAL: CORROSION RESISTING STEEL PER QQ-S-763 CLASS 316, CONDITION B.
     - (1) PASSIVATE: PER MIL-STD-171, PAR 5.4.2



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	J.P. Leonard	18MAR65
CHECKED	Tom Adrian	19MAR65
APPROVED		
APPROVED	Ellen C Hall	15April65
APPROVED MIT	W Kupfer	21Apr65
APPROVED NASA		4-21-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLUG, PIPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
—	C	1006332
SCALE NONE		SHEET 1 OF 1

MASTER

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS							
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 20101			6-15-65		
A		REVISED PER TDRR 21419	JWP		8/24/65	WR	

TABLE I

DASH NO.	TAPE WIDTH ±.005
-001	.275
-002	.625
-003	.688
-004	1.032
-005	.375
-006	.547

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS SPECIFIED BY MIL-D-70327.

B. MATERIAL DESCRIBED HEREIN SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-R-9300 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: INDIVIDUAL ROLLS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH A MINIMUM OF THE MANUFACTURER'S NAME AND OR SYMBOL, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-R-9300 .

(1) PACKAGING: DOMESTIC SHIPMENT

(2) PACKING: DOMESTIC SHIPMENT

(3) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES (AS RECEIVED):

(1) WIDTH: SEE TABLE I.

(2) THICKNESS: 0.0035 - 0.0040

(3) RESIN CONTENT (IGNITION TO CONSTANT WEIGHT 1050°F FOR 60 MINUTES MIN): 60% ± 5% BY WEIGHT.

B. MECHANICAL PROPERTIES (AFTER CURING FOR 45 MINUTES MAXIMUM AT 340° ± 10°F UNDER A PRESSURE OF 250 PSI MAXIMUM):

(1) FLEXURAL STRENGTH (.03 THK): IN ACCORDANCE WITH MIL-P-13949.

C. ELECTRICAL CHARACTERISTICS (CURED PER NOTE 2.B.):

(1) DIELECTRIC CONSTANT (1.0 MEGACYCLE): 4.4 MAX.

(2) LOSS TANGENT (1.0 MEGACYCLE): 0.045 MAX.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

MASTER

3. DESIGN:

A. STORAGE LIFE: 3 MONTHS MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL PACKAGES AT TEMPERATURES OF 60°F MAXIMUM, A RELATIVE HUMIDITY OF 50% MAXIMUM, AND IN THE ABSENCE OF ULTRA VIOLET LIGHT

B. DESCRIPTION: STYLE 108 GLASS CLOTH IN ACCORDANCE WITH MIL-Y-1140, FORM 4, CLASS C; UNIFORMLY IMPREGNATED WITH AN EPOXY RESIN WHICH HAS BEEN ADVANCED TO THE B-STAGE AND SLIT TO THE TAPE DIMENSIONS SHOWN IN TABLE I.

C. LENGTH OF ROLLS: 72 YARDS NOMINAL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	H. Wong DMS	8MAY65
CHECKED	E. Urban WBM	17MAY65
APPROVED		
APPROVED	Ellen C Hall	11 Jun 65
APPROVED MIT	M G Murley	6-15-65
APPROVED MSC		6/15/65
		DATE

TAPE, GLASS, EPOXY RESIN IMPREGNATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006333
SCALE NONE		SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 20101			6-16-65		
A		REVISED PER TDRR 21419			8/24/65	WK	
B		REVISED PER TDRR 23172			[illegible]	WK	

TABLE I

DASH NO.	TAPE WIDTH ±.005
-001	.275
-002	.625
-003	.688
-004	1.032
-005	.375
-006	.547

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS SPECIFIED BY MIL-D-70327.

B. MATERIAL DESCRIBED HEREIN SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-R-9300 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: INDIVIDUAL ROLLS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH A MINIMUM OF THE MANUFACTURER'S NAME AND OR SYMBOL, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-R-9300 .

(1) PACKAGING: DOMESTIC SHIPMENT

(2) PACKING: DOMESTIC SHIPMENT

(3) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES (AS RECEIVED):

(1) WIDTH: SEE TABLE I.

(2) THICKNESS: .005-.006

(3) RESIN CONTENT (IGNITION TO CONSTANT WEIGHT 1050°F FOR 60 MINUTES MIN): 46±2 % BY WEIGHT.

B. MECHANICAL PROPERTIES (AFTER CURING FOR 45 MINUTES MAXIMUM AT 340° ± 10°F UNDER A PRESSURE OF 250 PSI MAXIMUM):

(1) FLEXURAL STRENGTH (.03 THK): IN ACCORDANCE WITH MIL-P-13949.

C. ELECTRICAL CHARACTERISTICS (CURED PER NOTE 2.B.):

(1) DIELECTRIC CONSTANT (1.0 MEGACYCLE): 4.4 MAX.

(2) LOSS TANGENT (1.0 MEGACYCLE): 0.045 MAX.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

MASTER

3. DESIGN:

A. STORAGE LIFE: 3 MONTHS MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL PACKAGES AT TEMPERATURES OF 60°F MAXIMUM, A RELATIVE HUMIDITY OF 50% MAXIMUM, AND IN THE ABSENCE OF ULTRA VIOLET LIGHT

B. DESCRIPTION: STYLE 116 GLASS CLOTH IN ACCORDANCE WITH MIL-Y-1140, FORM 4, CLASS C; UNIFORMLY IMPREGNATED WITH AN EPOXY RESIN WHICH HAS BEEN ADVANCED TO THE B-STAGE AND SLIT TO THE TAPE DIMENSIONS SHOWN IN TABLE I.

C. LENGTH OF ROLLS: 72 YARDS NOMINAL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. Wong DMS 8 MAY 65
CHECKED E. Urban WSM 17 MAY 65
APPROVED
APPROVED 11 June 65
APPROVED MIT 6-15-65
APPROVED MSC 6/15/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE, GLASS, EPOXY RESIN IMPREGNATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006333
SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 20101			6-15-65	
A		REVISED PER TDRR 21419	Lup		8/24/65	WK
B		REVISED PER TDRR 23172			12/17/65	WK
C		REVISED PER TDRR 26548			3/1/66	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS SPECIFIED BY MIL-D-70327.

B. MATERIAL DESCRIBED HEREIN SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-R-9300 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: INDIVIDUAL ROLLS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH A MINIMUM OF THE MANUFACTURER'S NAME AND OR SYMBOL, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-R-9300 .

(1) PACKAGING: DOMESTIC SHIPMENT

(2) PACKING: DOMESTIC SHIPMENT

(3) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

TABLE I

DASH NO.	TAPE WIDTH ±.005
-001	.275
-002	.625
-003	.688
-004	1.032
-005	.375
-006	.547
-007	.190

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES (AS RECEIVED):

(1) WIDTH: SEE TABLE I.

(2) THICKNESS: .005-.006

(3) RESIN CONTENT (IGNITION TO CONSTANT WEIGHT 1050°F FOR 60 MINUTES MIN): 45 ± 3% BY WEIGHT.

(4) FLOW PERCENT (FOR 6 PLY) 15% ± 3% AT 340° ± 5°F AND 100 ± 10PSI

B. MECHANICAL PROPERTIES (AFTER CURING FOR 45 ± 5 MINUTES AT 340° ± 5°F UNDER A PRESSURE OF 250 PSI ± 10 PSI

(1) FLEXURAL STRENGTH (.03 THK): IN ACCORDANCE WITH MIL-P-13949.

C. ELECTRICAL CHARACTERISTICS (CURED PER NOTE 2.B.):

(1) DIELECTRIC CONSTANT (1.0 MEGACYCLE): 4.4 MAX.

(2) LOSS TANGENT (1.0 MEGACYCLE): 0.045 MAX.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

MASTER

3. DESIGN:

A. STORAGE LIFE: 3 MONTHS MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL PACKAGES AT TEMPERATURES OF 60°F MAXIMUM, A RELATIVE HUMIDITY OF 50% MAXIMUM, AND IN THE ABSENCE OF ULTRA VIOLET LIGHT

B. DESCRIPTION: STYLE 116 GLASS CLOTH IN ACCORDANCE WITH MIL-C-9084 TYPE II, UNIFORMLY IMPREGNATED WITH AN EPOXY RESIN WHICH HAS BEEN ADVANCED TO THE B-STAGE AND SLIT TO THE TAPE DIMENSIONS SHOWN IN TABLE I.

C. LENGTH OF ROLLS: 60 YARDS NOMINAL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	H. Wong DMS	8 MAY 65
CHECKED	E. Urban WSM	17 MAY 65
APPROVED		
APPROVED	Eldon C Hall	11 June 65
APPROVED MIT	W G Manley	6-15-65
APPROVED MSC		6/15/65
		DATE

TAPE, GLASS, EPOXY RESIN IMPREGNATED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006333
SCALE NONE		SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS SPECIFIED BY MIL-D-70327.

B. MATERIAL DESCRIBED HEREIN SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-R-9300 TYPE I EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: INDIVIDUAL ROLLS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH A MINIMUM OF THE MANUFACTURER'S NAME AND OR SYMBOL, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-R-9300 .

(1) PACKAGING: DOMESTIC SHIPMENT

(2) PACKING: DOMESTIC SHIPMENT

(3) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES (AS RECEIVED):

(1) WIDTH: SEE TABLE I.

(2) THICKNESS: .004-.006

(3) RESIN CONTENT (IGNITION TO CONSTANT WEIGHT 1050°F FOR 60 MINUTES MIN): 45 ± 3% BY WEIGHT.

(4) FLOW PERCENT (FOR 6 PLY): 15% ± 3% AT 340° ± 5°F AND 100 ± 10 PSI.

B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

~~B. AT 34 ... ER A PRESSURE OF 250 PSI MAXIMUM~~

~~C. (2) LOSS TANGENT (1.0 MEGACYCLE): 0.045 MAX~~

~~D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.~~

~~(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.~~

~~(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.~~

D. MECHANICAL PROPERTIES (AFTER CURING FOR 45 ± 5 MINUTES AT 340° ± 5°F UNDER A PRESSURE OF 250 PSI ± 10 PSI.

(1) FLEXURAL STRENGTH (.03 THK): IN ACCORDANCE WITH MIL-P-13949.

E. ELECTRICAL CHARACTERISTICS (CURED PER NOTE 3.B.):

(1) DIELECTRIC CONSTANT (1.0 MEGACYCLE): 4.4 MAX.

(2) LOSS TANGENT (1.0 MEGACYCLE): 0.045 MAX.

3. DESIGN:

A. STORAGE LIFE: 3 MONTHS MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL PACKAGES AT TEMPERATURES OF 60°F MAXIMUM, A RELATIVE HUMIDITY OF 50% MAXIMUM, AND IN THE ABSENCE OF ULTRA VIOLET LIGHT

B. DESCRIPTION: STYLE 116 GLASS CLOTH IN ACCORDANCE WITH MIL-C-9084 TYPE II, UNIFORMLY IMPREGNATED WITH AN EPOXY RESIN WHICH HAS BEEN ADVANCED TO THE B-STAGE AND SLIT TO THE TAPE DIMENSIONS SHOWN IN TABLE I.

C. LENGTH OF ROLLS: 60 YARDS NOMINAL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE I

DASH NO.	TAPE WIDTH ±.005
-001	.275
-002	.625
-003	.688
-004	1.032
-005	.375
-006	.547
-007	.190

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—	—	INITIAL RELEASE CLASS A PER TDRR 20101			6-15-65	—
A		REVISED PER TDRR 21419	JWP		8/24/65	WK
B		REVISED PER TDRR 23172			11/12/65	WK
C		REVISED PER TDRR 26548			3/1/66	WK
D		REVISED PER TDRR 28874			5-24-66	[illegible]

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. Wong DMS 3 MAY65
CHECKED E Urban 17 MAY65
APPROVED
APPROVED Ellen C Hall
APPROVED MIT M G Murley 6-15-65
APPROVED MSC 6/15/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE, GLASS, EPOXY RESIN IMPREGNATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006333
SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 20101			6-15-65		
A		REVISED PER TDRR 21419			8/24/65	WR	
B		REVISED PER TDRR 23172			10/19/65	WR	
C		REVISED PER TDRR 26548			3/1/66	WR	
D		REVISED PER TDRR 28874			5-24-66		
E		REVISED PER TDRR 30867	JI	RLW	12 SEP. '66		

TABLE I

DASH NO.	TAPE WIDTH ±.005
-001	.275
-002	.625
-003	.688
-004	1.032
-005	.375
-006	.547
-007	.190

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS SPECIFIED BY MIL-D-70327.

B. MATERIAL DESCRIBED HEREIN SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-R-9300 TYPE I EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: INDIVIDUAL ROLLS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH A MINIMUM OF THE MANUFACTURER'S NAME AND OR SYMBOL, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-R-9300.

(1) PACKAGING: DOMESTIC SHIPMENT

(2) PACKING: DOMESTIC SHIPMENT

(3) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES (AS RECEIVED):

(1) WIDTH: SEE TABLE I.

(2) THICKNESS: .006 NOMINAL

(3) RESIN CONTENT (IGNITION TO CONSTANT WEIGHT 1050°F FOR 60 MINUTES MIN): 45 ± 3% BY WEIGHT.

(4) FLOW PERCENT (FOR 6 PLY): 15% ± 3% AT 340° ± 5°F AND 100 ± 10 PSI.

B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

D. MECHANICAL PROPERTIES (AFTER CURING FOR 45 ± 5 MINUTES AT 340° ± 5°F UNDER A PRESSURE OF 250 PSI ± 10 PSI.

(1) FLEXURAL STRENGTH (.03 THK): IN ACCORDANCE WITH MIL-P-13949.

E. ELECTRICAL CHARACTERISTICS (CURED PER NOTE 3.B.):

(1) DIELECTRIC CONSTANT (1.0 MEGACYCLE): 4.4 MAX.

(2) LOSS TANGENT (1.0 MEGACYCLE): 0.045 MAX.

3. DESIGN:

A. STORAGE LIFE: 6 MONTHS MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL PACKAGES AT TEMPERATURES OF 40°F MAXIMUM, A RELATIVE HUMIDITY OF 50% MAXIMUM, AND IN THE ABSENCE OF ULTRA VIOLET LIGHT

B. DESCRIPTION: STYLE 116 GLASS CLOTH IN ACCORDANCE WITH MIL-C-9084 TYPE II, UNIFORMLY IMPREGNATED WITH AN EPOXY RESIN WHICH HAS BEEN ADVANCED TO THE B-STAGE AND SLIT TO THE TAPE DIMENSIONS SHOWN IN TABLE I.

C. LENGTH OF ROLLS: 60 YARDS NOMINAL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong DMS	8MAY65
CHECKED	E. Urban WBM	17MAY65
APPROVED		
APPROVED	Eldon C Hall	11June65
APPROVED MIT		6-15-65
APPROVED MSC		6/15/65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE, GLASS, EPOXY RESIN IMPREGNATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006333
SCALE NONE		SHEET 1 OF 1

1006333 E

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

TABLE I

DASH NO.	TAPE WIDTH ±.005
-001	.275
-002	.625
-003	.688
-004	1.032

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 20101			6-16-65	

REQUIREMENTS:

. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS SPECIFIED BY MIL-D-70327.

B. MATERIAL DESCRIBED HEREIN SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-R-9300 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: INDIVIDUAL ROLLS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH A MINIMUM OF THE MANUFACTURER'S NAME AND OR SYMBOL, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-R-9300 .

(1) PACKAGING: DOMESTIC SHIPMENT

(2) PACKING: DOMESTIC SHIPMENT

(3) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES (AS RECEIVED):

(1) WIDTH: SEE TABLE I.

(2) THICKNESS: 0.0035 - 0.0040

(3) RESIN CONTENT (IGNITION TO CONSTANT WEIGHT 1050°F FOR 60 MINUTES MIN): 60% ± 5% BY WEIGHT.

B. MECHANICAL PROPERTIES (AFTER CURING FOR 45 MINUTES MAXIMUM AT 340° ± 10°F UNDER A PRESSURE OF 250 PSI MAXIMUM):

(1) FLEXURAL STRENGTH (.03 THK): IN ACCORDANCE WITH MIL-P-13949.

C. ELECTRICAL CHARACTERISTICS (CURED PER NOTE 2.B.):

(1) DIELECTRIC CONSTANT (1.0 MEGACYCLE): 4.4 MAX.

(2) LOSS TANGENT (1.0 MEGACYCLE): 0.045 MAX.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

MASTER

3. DESIGN:

A. STORAGE LIFE: 3 MONTHS MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL PACKAGES AT TEMPERATURES OF 60°F MAXIMUM, A RELATIVE HUMIDITY OF 50% MAXIMUM, AND IN THE ABSENCE OF ULTRA VIOLET LIGHT

B. DESCRIPTION: STYLE 108 GLASS CLOTH IN ACCORDANCE WITH MIL-Y-1140, FORM 4, CLASS C; UNIFORMLY IMPREGNATED WITH AN EPOXY RESIN WHICH HAS BEEN ADVANCED TO THE B-STAGE AND SLIT TO THE TAPE DIMENSIONS SHOWN IN TABLE I.

C. LENGTH OF ROLLS: 72 YARDS NOMINAL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	H. Wang DMS	8MAY65
CHECKED	E. Urban WSM	17MAY65
APPROVED		
APPROVED	Ellen C Hall	11 June 65
APPROVED MIT	M G Murley	6-15-65
APPROVED MSC	W Milacek	6/15/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE, GLASS, EPOXY RESIN IMPREGNATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006333
SCALE NONE		SHEET 1 OF 1

1006336 A

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			
—	INITIAL RELEASE CLASS A PER TDRR 19616	4-27-65	WK
A	REVISED PER TDRR 19925	6/15/65	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

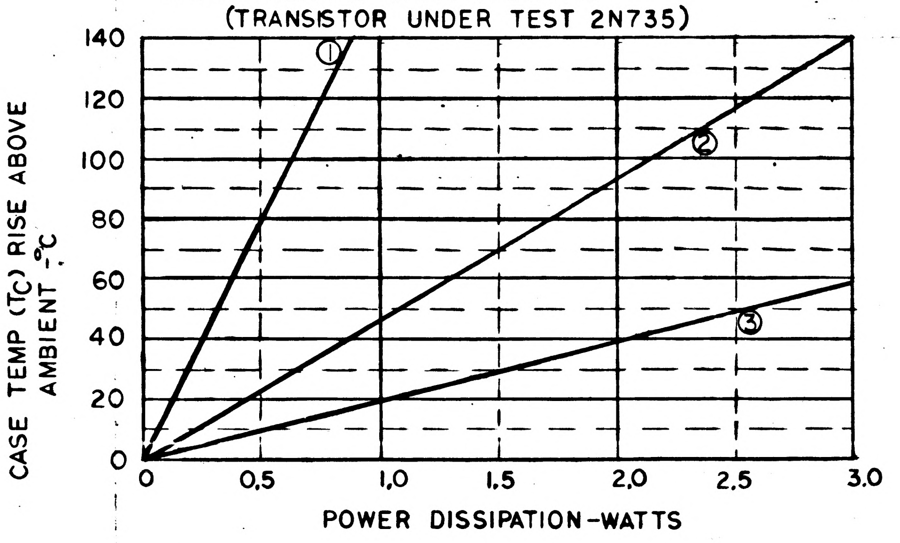
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. PART MARKING: PARTS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS, AND FINISH REQUIREMENTS.
     - [illegible]

3. DESIGN:
   - A. THERMAL RATING: SEE FIGURE 1.
   - B. CONSTRUCTION: TWO-PIECE HOLDER FOR TO-18 TRANSISTORS
     - (1) MATERIAL AND HARDNESS: ALUMINUM ALLOY 2024-T4 PER QQ-A-225.
     - (2) PROTECTIVE FINISH: ANODIZE PER MIL-A-8625, TYPE I, COLOR BLACK.

DASH NO	DESCRIPTION
-001	CAP & TAPPED BASE
-002	CAP & STUD MTG BASE

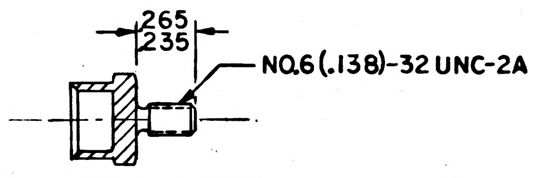
FIG. 1-THERMAL CHARACTERISTIC (TRANSISTOR UNDER TEST 2N735)



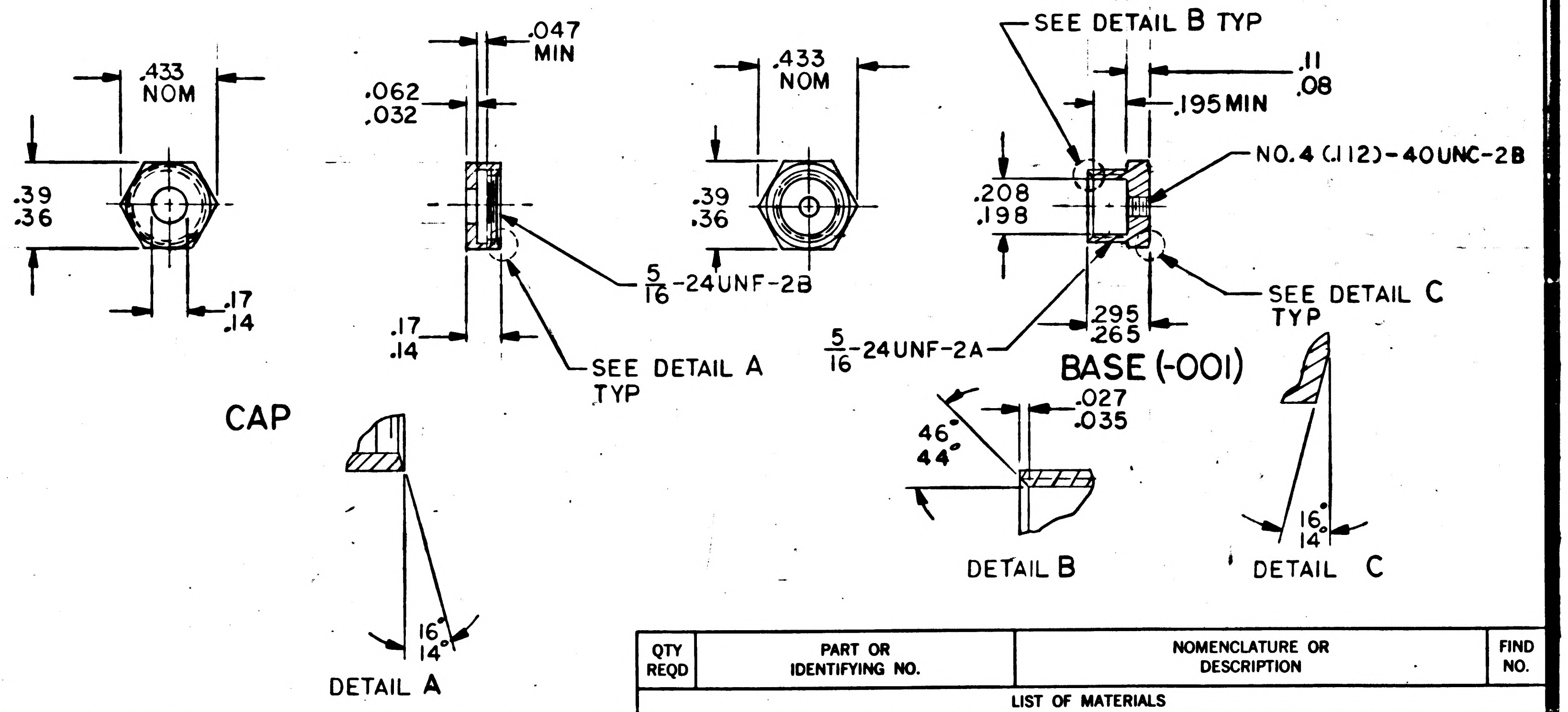
①=TO-18 CASE-NO HEAT SINK

②=TO-18 CASE IN HEAT SINK-NATURAL CONVECTION

③=TO-18 CASE IN HEAT SINK MOUNTED ON 6X6X.06 AL PLATE



BASE (-002)



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Mosey DATE 12APR65
CHECKED Tom Adrian 13APR65
APPROVAL McG
APPROVAL E J Diggs 4/22/65
NASA APPROVAL W J Rhine 4-27-65
MIT APPROVAL
MIT APPROVAL W Geoffer 21Apr65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HEATSINK, ELECTRICAL-
ELECTRONIC COMPONENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006336

SCALE NONE | WT | SHEET 1 OF 1

4 3 2 1

—	1006336

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 18616	4-27-65	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

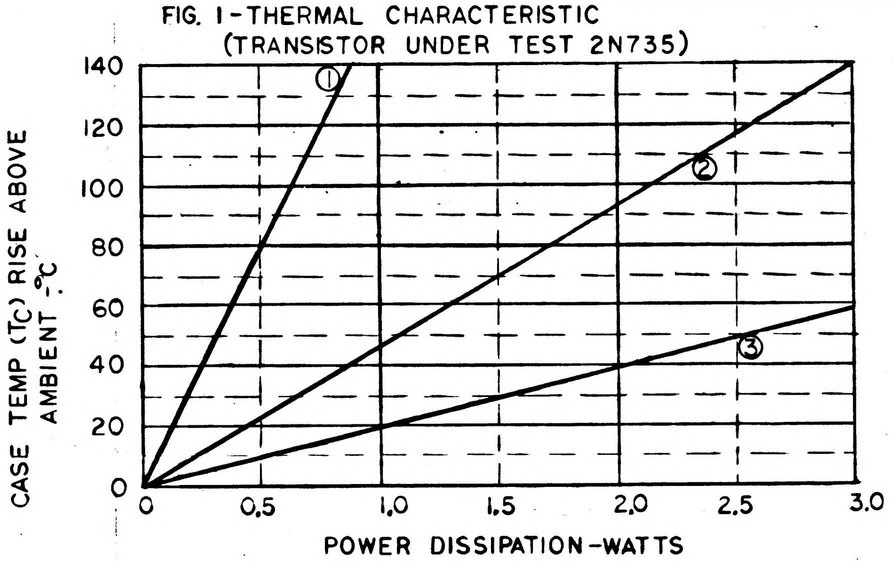
REQUIREMENTS:

1. GENERAL:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
    - C. PART MARKING: PARTS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
    - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.
        - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

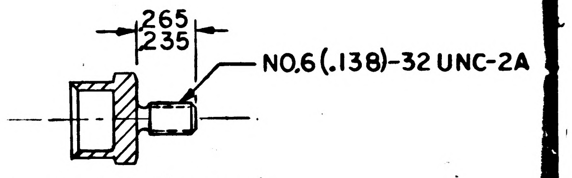
2. ACCEPTANCE AND INSPECTION:
    - A. MECHANICAL REQUIREMENTS:
        - (1) DIMENSIONS: AS DELINEATED HEREIN.
        - (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.
    - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
        - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS, AND FINISH REQUIREMENTS.

3. DESIGN:
    - A. THERMAL RATING: SEE FIGURE 1.
    - B. CONSTRUCTION: TWO-PIECE HOLDER FOR TO-18 TRANSISTORS
        - (1) MATERIAL AND HARDNESS: ALUMINUM ALLOY 2024-T4 PER QQ-A-225.
        - (2) PROTECTIVE FINISH: ANODIZE PER MIL-A-8625, TYPE I, COLOR BLACK.

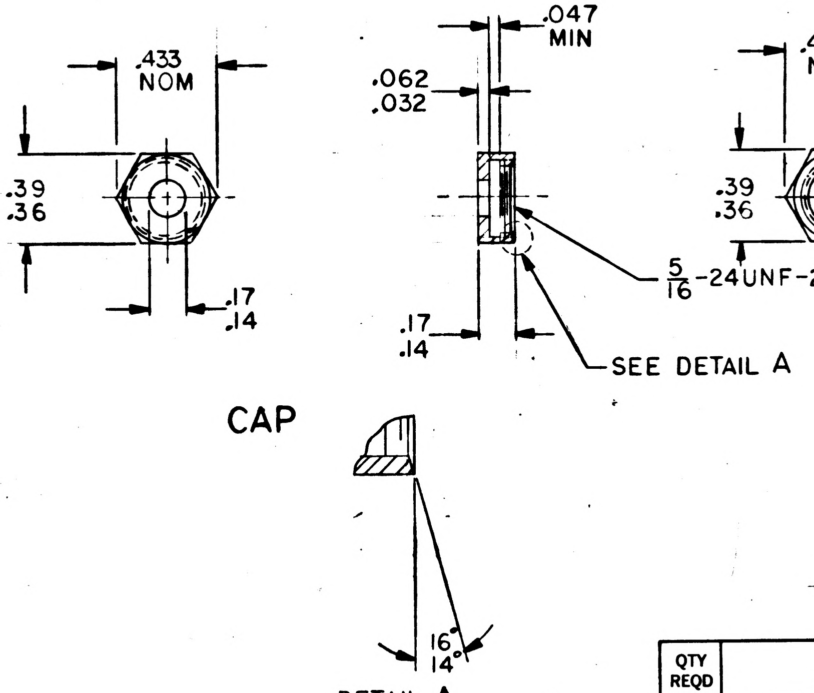
FIG. 1-THERMAL CHARACTERISTIC (TRANSISTOR UNDER TEST 2N735)



①=TO-18 CASE-NO HEAT SINK
②=TO-18 CASE IN HEAT SINK-NATURAL CONVECTION
③=TO-18 CASE IN HEAT SINK MOUNTED ON 6X6X.06 AL PLATE

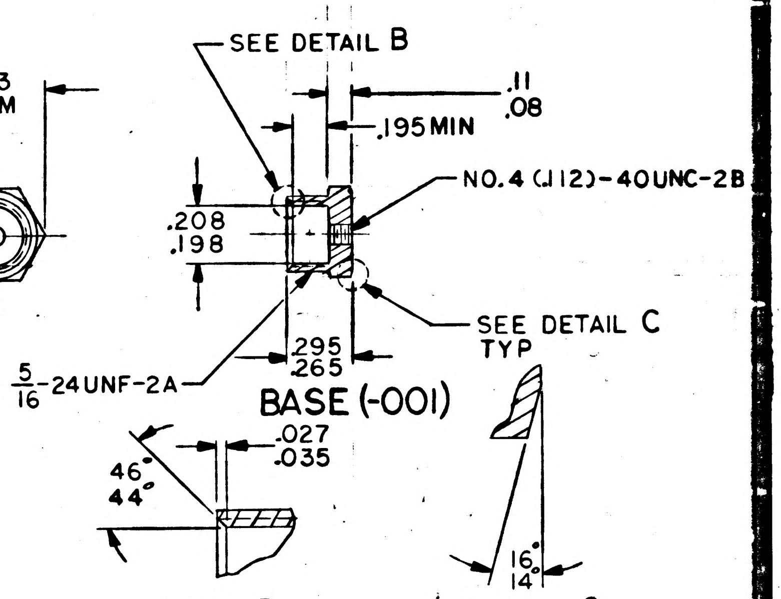


BASE (-002)



CAP

DETAIL A



BASE (-001)

DETAIL B

DETAIL C

DASH NO	DESCRIPTION
-001	CAP & TAPPED BASE
-002	CAP & STUD MTG BASE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Massey DATE 12APR65
CHECKED 13APR65
APPROVAL McG
APPROVAL E J Duggan 4/22/65
NASA APPROVAL W J 4-27-65
MIT APPROVAL
MIT APPROVAL W Cuffe 22Apr65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HEATSINK, ELECTRICAL-
ELECTRONIC COMPONENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
80230	C	1006336	
SCALE NONE	WT		SHEET 1 OF 1

MASTER

4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006338 A

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 20235			6-22-65	
A		REVISED PER TDRR 23457			11/2/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: CARTONS AND INDIVIDUAL TUBES SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME, PRODUCT DESIGNATION, NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) DATE OF MANUFACTURE AND EXPIRATION DATE.

D. PREPARATION FOR DELIVERY: PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE BEST COMMERCIAL PRACTICE.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. MARKING: AS SPECIFIED HEREIN.

B. PROPERTIES BEFORE CURING:

(1) APPEARANCE: PER TABLE I

(2) ODOR: ACETIC ACID (VINEGAR).

(3) SOLIDS CONTENT: CONTAINS NO SOLVENT. -92% SOLIDS MINIMUM, BY WEIGHT, RETAINED WHEN TESTED 24 HOURS @ 158° ± 2°F IN CIRCULATING AIR OVEN.

(4) FLOW OR SAG: 0.1 INCH MAXIMUM WHEN TESTED PER MIL-S-8802.

3. DESIGN:

A. THIS MATERIAL IS A ONE PART ROOM-TEMPERATURE VULCANIZING SILICONE RUBBER ADHESIVE SEALANT COMPOUND REQUIRING NO ADDITIONAL CURING AGENT ADDITIVE.

B. PROPERTIES AFTER CURING FOR ONE WEEK AT 77° ± 2°F AND 50% RELATIVE HUMIDITY.

(1) HARDNESS, SHORE A: 25 TO 40 PER ASTM METHOD D676.

(2) TENSILE STRENGTH: 300 PSI MINIMUM PER ASTM METHOD D412.

(3) ELONGATION: 300% MINIMUM PER ASTM METHOD D412.

(4) TEAR RESISTANCE: ~~30LB/INCH MIN.~~ LB/INCH PER ASTM METHOD D624, DIE B.

(5) LINEAR SHRINKAGE: 1% MAXIMUM.

(6) SPECIFIC GRAVITY: 1.07 ± 0.2 PER ASTM METHOD D297.

(7) VOLUME RESISTIVITY: 1 X 10^{15} MINIMUM OHM-CM PER ASTM METHOD D257.

(8) DIELECTRIC STRENGTH: PER ASTM METHOD D149. (SHORT TIME TEST) 75 MIL. SHEET THICKNESS, 1" ELECTRODE: 1" IN LENGTH WITH EDGES ROUNDED TO A RADIUS OF 1/8"; IN TRANSFORMER OIL: 380 VOLTS/MIL; MIN., @ 77° ± 2°F.

(9) DIELECTRIC CONSTANT: PER ASTM METHOD D150.

(a) AT 60 CPS: 2.8 TO 3.2

(b) AT 1.0 MC: 2.8 TO 3.2

(10) DISSIPATION FACTOR: PER ASTM METHOD D150.

60 TO 10^6 CPS: 0.0029 ± 0.0005

C. AMBIENT TEMPERATURE RANGE: THIS MATERIAL, WHEN CURED, SHALL BE CAPABLE OF WITHSTANDING TEMPERATURES FROM -75°F TO +300°F FOR EXTENDED PERIODS AND UP TO +500°F FOR SHORT PERIODS.

D. STORAGE LIFE: 6 MONTHS MINIMUM, 1 YEAR MAXIMUM AT TEMPERATURES BELOW 80°F, IN TIGHTLY CLOSED CONTAINERS.

TABLE I.

DASH NO.	COLOR
-000	WHITE PASTE
-001	BLACK
-002	TRANSPARENT

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN HBM 30MAR65
CHECKED 1APR65
APPROVED
APPROVED Eldon C Hall 21 Jun 65
APPROVED MIT 22 Jn 65
APPROVED MSC 6/24/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEALING COMPOUND,
SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006338
SCALE NONE
SHEET 1 OF 1

B 1006338

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 20235			6-22-65	
A		REVISED PER TDRR 23457			11/2/65	WK
B		REVISED PER TDRR 33708	A.N.	Own	7 AUG 67	

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: CARTONS AND INDIVIDUAL TUBES SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME, PRODUCT DESIGNATION, NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) DATE OF MANUFACTURE AND EXPIRATION DATE.

D. PREPARATION FOR DELIVERY: PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE BEST COMMERCIAL PRACTICE.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. MARKING: AS SPECIFIED HEREIN.

B. PROPERTIES BEFORE CURING:

(1) APPEARANCE: PER TABLE I

(2) ODOR: ACETIC ACID (VINEGAR).

(3) SOLIDS CONTENT: CONTAINS NO SOLVENT. -92% SOLIDS MINIMUM, BY WEIGHT, RETAINED WHEN TESTED 24 HOURS @ 158° ± 2°F IN CIRCULATING AIR OVEN.

(4) FLOW OR SAG: 0.1 INCH MAXIMUM WHEN TESTED PER MIL-S-8802.

3. DESIGN:

A. THIS MATERIAL IS A ONE PART ROOM-TEMPERATURE VULCANIZING SILICONE RUBBER ADHESIVE SEALANT COMPOUND REQUIRING NO ADDITIONAL CURING AGENT ADDITIVE.

B. PROPERTIES AFTER CURING FOR ONE WEEK AT 77° ± 2°F AND 50% RELATIVE HUMIDITY.

(1) HARDNESS, SHORE A: 25 TO 40 PER ASTM METHOD D676.

(2) TENSILE STRENGTH: 300 PSI MINIMUM PER ASTM METHOD D412.

(3) ELONGATION: 300% MINIMUM PER ASTM METHOD D412.

(4) TEAR RESISTANCE: ~~30LB/INCH MIN.~~ LB/INCH PER ASTM METHOD D624, DIE B.

(5) LINEAR SHRINKAGE: 1% MAXIMUM.

(6) SPECIFIC GRAVITY: 1.07 ± 0.2 PER ASTM METHOD D297.

(7) VOLUME RESISTIVITY: 1 X 10^{15} MINIMUM OHM-CM PER ASTM METHOD D257.

(8) DIELECTRIC STRENGTH: PER ASTM METHOD D149. (SHORT TIME TEST) 75 MIL. SHEET THICKNESS, 1" ELECTRODE: 1" IN LENGTH WITH EDGES ROUNDED TO A RADIUS OF 1/8"; IN TRANSFORMER OIL: 300 VOLTS/MIL; MIN., @ 77° ± 2°F.

(9) DIELECTRIC CONSTANT: PER ASTM METHOD D150.

(a) AT 60 CPS: 2.8 TO 3.2

(b) AT 1.0 MC: 2.8 TO 3.2

(10) DISSIPATION FACTOR: PER ASTM METHOD D150.

60 TO 10^6 CPS: 0.0029 ± 0.0005

C. AMBIENT TEMPERATURE RANGE: THIS MATERIAL, WHEN CURED, SHALL BE CAPABLE OF WITHSTANDING TEMPERATURES FROM -75°F TO +300°F FOR EXTENDED PERIODS AND UP TO +500°F FOR SHORT PERIODS.

D. STORAGE LIFE: 6 MONTHS MINIMUM, 1 YEAR MAXIMUM AT TEMPERATURES BELOW 80°F, IN TIGHTLY CLOSED CONTAINERS.

TABLE I.

DASH NO.	COLOR
-000	WHITE PASTE
-001	BLACK
-002	TRANSPARENT
-003	ALUMINUM

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

		DATE
DRAWN	HBM	30MAR65
CHECKED		1APR65
APPROVED		
APPROVED	Eldon C Hall	21 Jun 65
APPROVED MIT	W Coppler	22 Jun 65
APPROVED MSC	W Michael	6/21/65

SEALING COMPOUND,
SILICONE RUBBER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006338

SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006338

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 20235			6-22-65	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: CARTONS AND INDIVIDUAL TUBES SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME, PRODUCT DESIGNATION, NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER) DATE OF MANUFACTURE AND EXPIRATION DATE.

D. PREPARATION FOR DELIVERY: PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE BEST COMMERCIAL PRACTICE.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. MARKING: AS SPECIFIED HEREIN.

B. PROPERTIES BEFORE CURING:

(1) APPEARANCE: WHITE PASTE.

(2) ODOR: ACETIC ACID (VINEGAR).

(3) SOLIDS CONTENT: CONTAINS NO SOLVENT. -92% SOLIDS MINIMUM, BY WEIGHT, RETAINED WHEN TESTED 24 HOURS @ 158° ± 2°F IN CIRCULATING AIR OVEN.

(4) FLOW OR SAG: 0.1 INCH MAXIMUM WHEN TESTED PER MIL-S-8802.

3. DESIGN:

A. THIS MATERIAL IS A ONE PART ROOM-TEMPERATURE VULCANIZING SILICONE RUBBER ADHESIVE SEALANT COMPOUND REQUIRING NO ADDITIONAL CURING AGENT ADDITIVE.

B. PROPERTIES AFTER CURING FOR ONE WEEK AT 77° ± 2°F AND 50% RELATIVE HUMIDITY.

(1) HARDNESS, SHORE A: 25 TO 40 PER ASTM METHOD D676.

(2) TENSILE STRENGTH: 300 PSI MINIMUM PER ASTM METHOD D412.

(3) ELONGATION: 300% MINIMUM PER ASTM METHOD D412.

(4) TEAR RESISTANCE: ~~30LB/INCH MIN.~~ LB/INCH PER ASTM METHOD D624, DIE B.

(5) LINEAR SHRINKAGE: 1% MAXIMUM.

(6) SPECIFIC GRAVITY: 1.07 ± 0.2 PER ASTM METHOD D297.

(7) VOLUME RESISTIVITY: 1 X 10^{15} MINIMUM OHM-CM PER ASTM METHOD D257.

(8) DIELECTRIC STRENGTH: PER ASTM METHOD D149. (SHORT TIME TEST) 75 MIL. SHEET THICKNESS, 1" ELECTRODE: 1" IN LENGTH WITH EDGES ROUNDED TO A RADIUS OF 1/8"; IN TRANSFORMER OIL: 300 VOLTS/MIL; MIN., @ 77° ± 2°F.

(9) DIELECTRIC CONSTANT: PER ASTM METHOD D150.

(a) AT 60 CPS: 2.8 TO 3.2

(b) AT 1.0 MC: 2.8 TO 3.2

(10) DISSIPATION FACTOR: PER ASTM METHOD D150.

60 TO 10^6 CPS: 0.0029 ± 0.0005

C. AMBIENT TEMPERATURE RANGE: THIS MATERIAL, WHEN CURED, SHALL BE CAPABLE OF WITHSTANDING TEMPERATURES FROM -75°F TO +300°F FOR EXTENDED PERIODS AND UP TO +500°F FOR SHORT PERIODS.

D. STORAGE LIFE: 6 MONTHS MINIMUM, 1 YEAR MAXIMUM AT TEMPERATURES BELOW 80°F, IN TIGHTLY CLOSED CONTAINERS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	D. Moray 48M	30MAR65
CHECKED	Walkenay	1APR65
APPROVED		
APPROVED	Eldon C Hall	21 Jun 65
APPROVED MIT	W Cugler	22 Jun 65
APPROVED MSC	W Michael	6/24/65
		DATE

SEALING COMPOUND,
SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

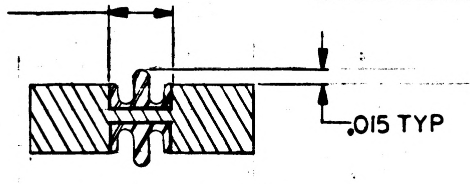
CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006338
SCALE NONE		SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006339

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CL. A PER TDRR 19607			5/26/65	WK



SECTION A–A
ENLARGED

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PART MARKING: UNITS SHALL BE MARKED: PER ND 1002019, USING INK PER ND1010920, ON THE SURFACE(S) INDICATED: WITH THE MANUFACTURERS SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER)

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

2. ACCEPTANCE & INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.

(3) COMPRESSION: PARTS SHALL BE CAPABLE OF COMPLETE COMPRESSION BETWEEN TWO FLAT PLATES WITHOUT DAMAGE TO THE RUBBER GASKET.

(4) SURFACE ROUGHNESS 125√

B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND1015404 CLASS 2

3. DESIGN:

A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77 ± 5°F AND 50% RH).

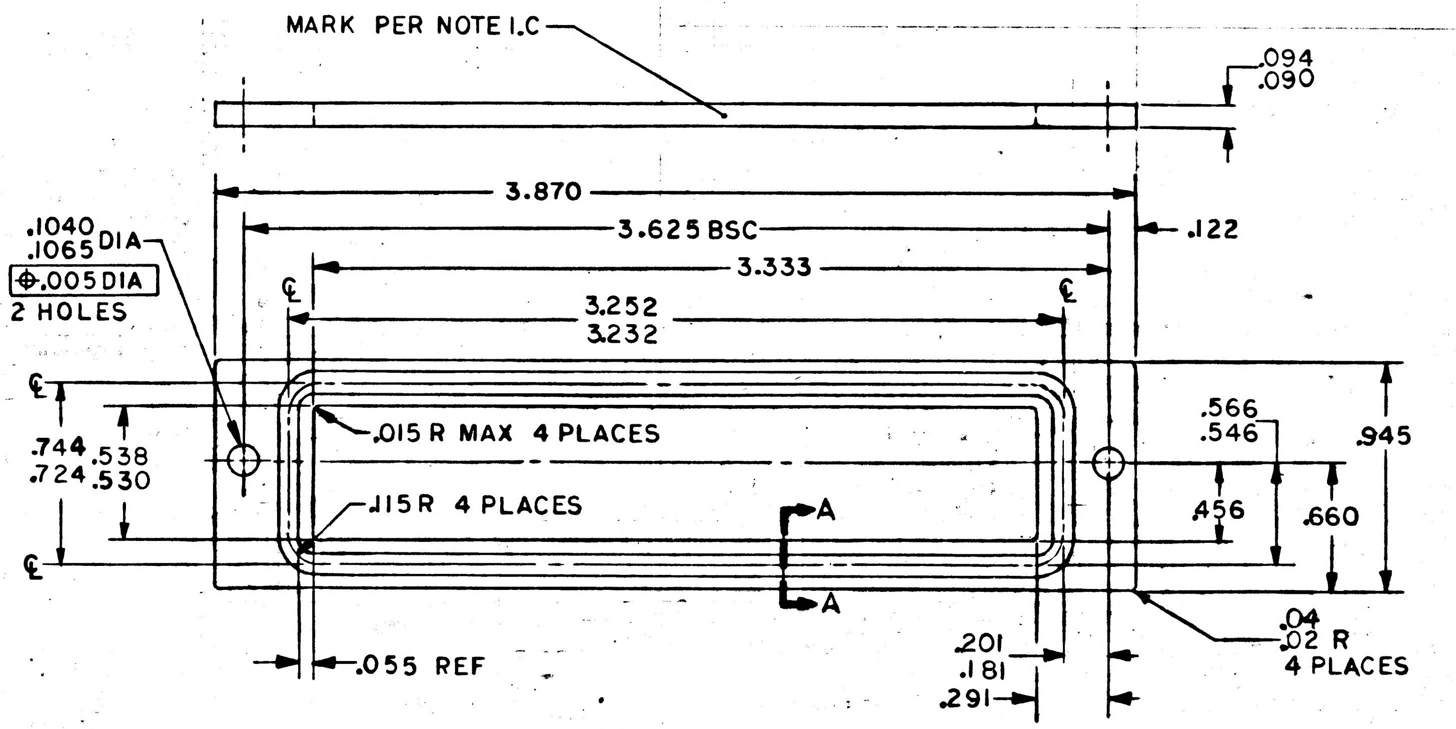
B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.

(1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, CHROMATE PER MIL-C-5541, TYPE II GRADE C, CLASS 3

(2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238.

(3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-785).

C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERES.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	D. Morey DMB	9APR65
CHECKED	A. Marts	5-21-65
APPROVED		
APPROVED	Eldon C Hall	26May65
APPROVED MIT		
APPROVED MSC		5/26/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, PLATE
BONDED RUBBER, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006339

SCALE NONE
SHEET 1 OF 1

1006340 A

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

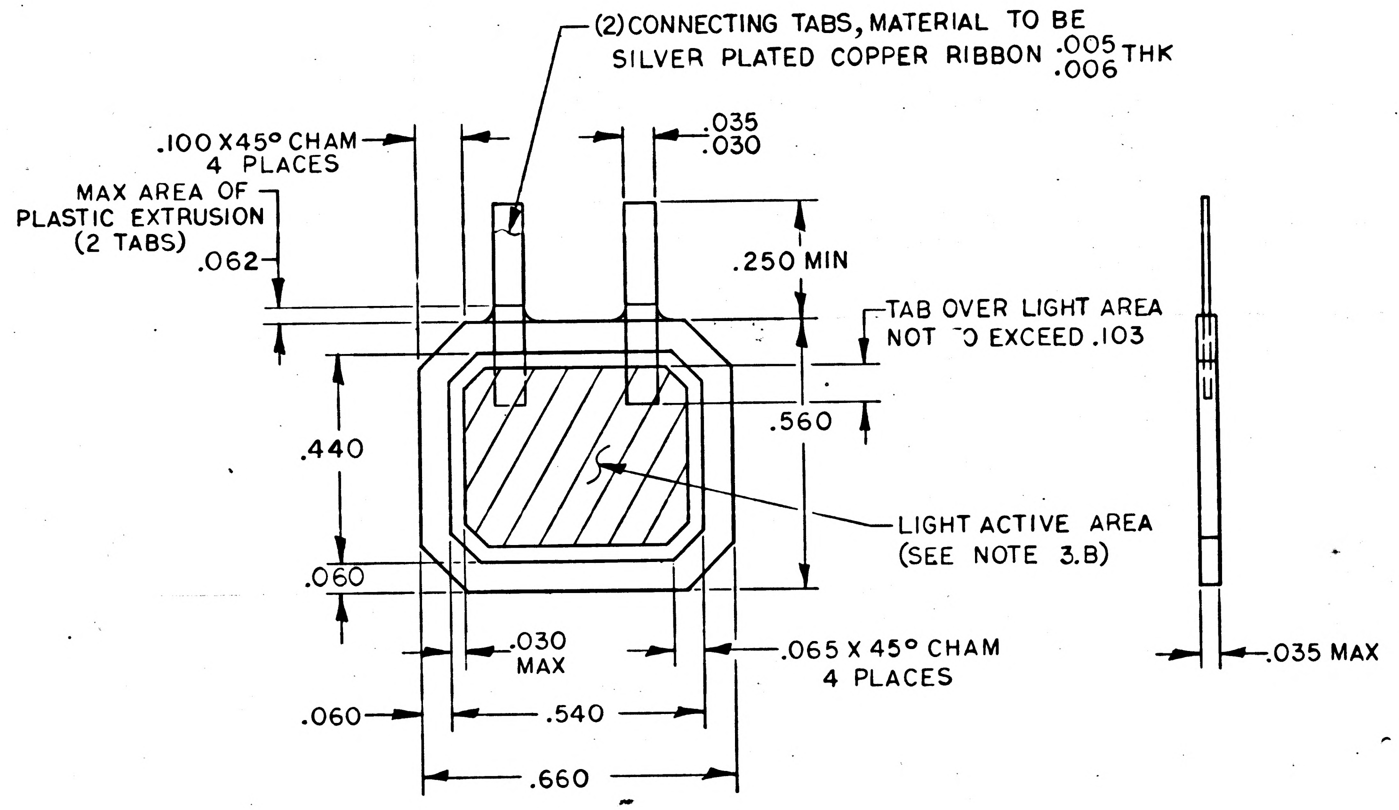
REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 19722			6-2-65	Wl
A		REVISED PER TDRR 20109	EJ		6/28/65	WK.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) TERMINALS: SHALL BE FREE OF PLASTIC OR ANY OTHER CONTAMINANTS WHICH WOULD ADVERSELY AFFECT SOLDERED CONNECTIONS.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT OUTPUT: 2 FOOT-LAMBERTS MINIMUM WHEN EXCITED BY 75V±1 AT 400 CPS.
     - (2) CURRENT: 3.0 MA. MAX. @ 75 V, 400 CPS
     - (3) POWER FACTOR: 0.6 MAX. @ 75 V, 400 CPS
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

3. DESIGN:
   - A. CONSTRUCTION: ELECTROLUMINESCENT CELL SANDWICHED AND SEALED BETWEEN TWO SHEETS OF PLASTIC INSULATION.
     - (1) ELECTRICAL LEADS SHALL BE COPPER RIBBON, SILVER PLATED PER QQ-S-365, TYPE 1 GRADE B.
   - B. COLOR: WHITE, WITH COLOR COORDINATES: X = 0.330 ± 0.030; Y = 0.330 ± 0.030 WHEN MEASURED IN ACCORDANCE WITH PROCEDURES OF MIL-L-27160.


(2) CONNECTING TABS, MATERIAL TO BE SILVER PLATED COPPER RIBBON .005/.006 THK
.100 X 45° CHAM 4 PLACES
.035/.030
MAX AREA OF PLASTIC EXTRUSION (2 TABS)
.062
.250 MIN
TAB OVER LIGHT AREA NOT TO EXCEED .103
.440
.560
LIGHT ACTIVE AREA (SEE NOTE 3.B)
.060
.030 MAX
.065 X 45° CHAM 4 PLACES
.035 MAX
.060
.540
.660

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ANGLES ± 5°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Mmoy 30MAR65
CHECKED Walburg 30MAR65
APPROVED
APPROVED Eldon C Hall 1 Jun 65
APPROVED MIT W Kapfer 2 Jun 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PANEL, ELECTROLUMINESCENT, PLASTIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006340
SCALE NONE
SHEET 1 OF 1

1006340 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER: AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 19722			6-2-65	WK
A		REVISED PER TDRR 20109	EJ		6/28/65	WK
B		REVISED PER TDRR 21418	YMP		8/27/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) TERMINALS: SHALL BE FREE OF PLASTIC OR ANY OTHER CONTAMINANTS WHICH WOULD ADVERSELY AFFECT SOLDERED CONNECTIONS.

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT OUTPUT: 2 FOOT-LAMBERTS MINIMUM WHEN EXCITED BY 75V±1 AT 400 CPS.

(2) CURRENT: 3.0 MA. MAX. @ 75 V, 400 CPS

(3) POWER FACTOR: 0.6 MAX. @ 75 V, 400 CPS

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

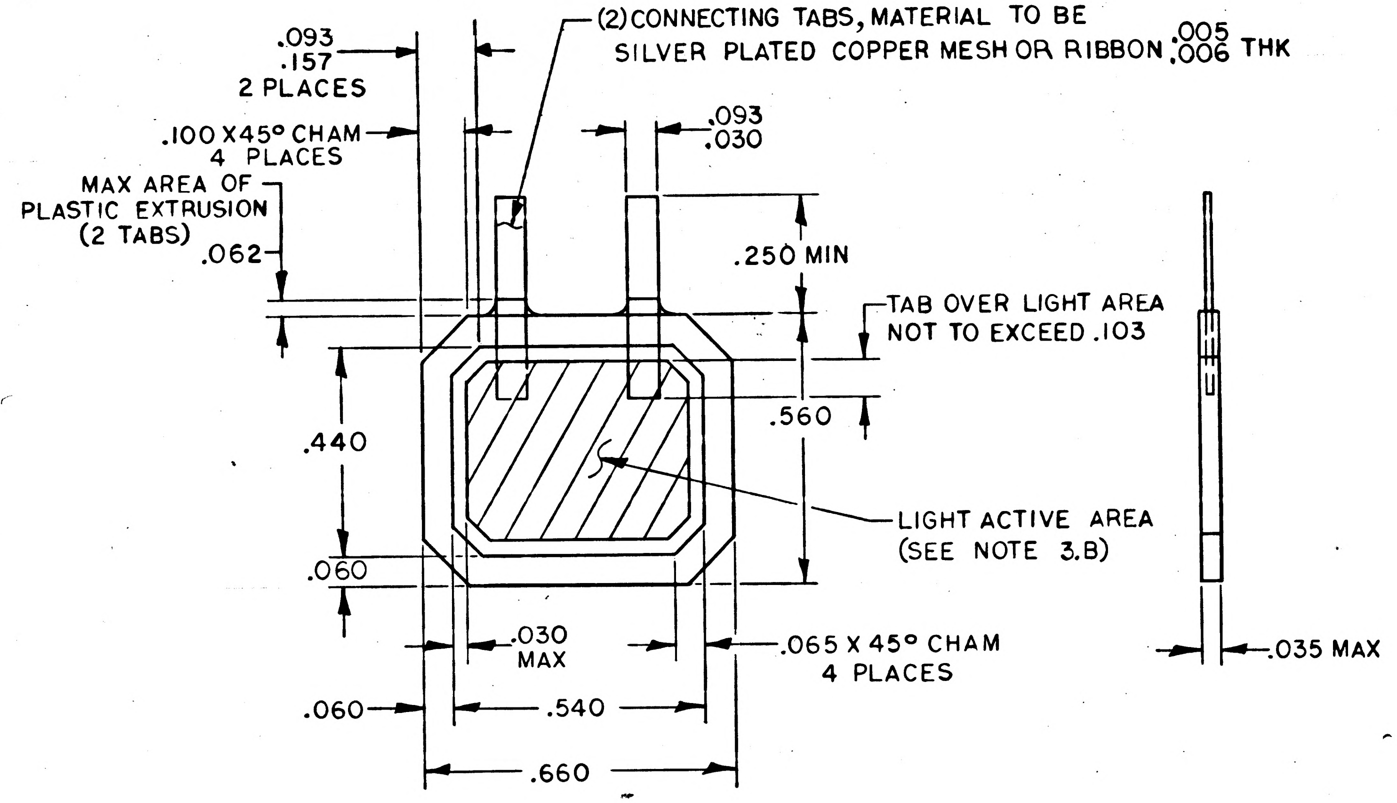
(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

3. DESIGN:

A. CONSTRUCTION: ELECTROLUMINESCENT CELL SANDWICHED AND SEALED BETWEEN TWO SHEETS OF PLASTIC INSULATION.

(1) ELECTRICAL LEADS SHALL BE COPPER MESH OR RIBBON, SILVER PLATED PER QQ-S-365, TYPE 1 GRADE B.

B. COLOR: WHITE, WITH COLOR COORDINATES: X = 0.330 ± 0.030; Y = 0.330 ± 0.030 WHEN MEASURED IN ACCORDANCE WITH PROCEDURES OF MIL-L-27160.


(2) CONNECTING TABS, MATERIAL TO BE SILVER PLATED COPPER MESH OR RIBBON .005 .006 THK
.093 .157 2 PLACES
.100 X 45° CHAM 4 PLACES
MAX AREA OF PLASTIC EXTRUSION (2 TABS)
.062
.093 .030
.250 MIN
TAB OVER LIGHT AREA NOT TO EXCEED .103
.560
.440
LIGHT ACTIVE AREA (SEE NOTE 3.B)
.060
.030 MAX
.065 X 45° CHAM 4 PLACES
.035 MAX
.060
.540
.660

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ANGLES ± 5°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN D. Moncy 30MAR65
CHECKED J Walbourg 30MAR65
APPROVED
APPROVED Eldon C Hall 1 Jun 65
APPROVED MIT W Kupfer 2 Jun 65
APPROVED MSC 6/2/65
DATE

PANEL, ELECTROLUMINESCENT, PLASTIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006340
SCALE NONE
SHEET 1 OF 1

1006340 C

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 19722			6-2-65	Wll
A		REVISED PER TDRR 20100	EJ		6/28/65	WK
B		REVISED PER TDRR 2141	YMP		8/27/65	WK
C		REVISED PER TDRR 22141	EY		9-14	MGM

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING SPECIFIED IN ND 1002215.

(2) UNIT MARKING SHALL CONSIST OF MANUFACTURER'S IDENTIFICATION AND DATE CODE.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) TERMINALS: SHALL BE FREE OF PLASTIC OR ANY OTHER CONTAMINANTS WHICH WOULD ADVERSELY AFFECT SOLDERED CONNECTIONS.

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT OUTPUT: 2.0 FOOT-LAMBERTS MINIMUM, 3.0 FOOT-LAMBERTS MAXIMUM, WHEN EXCITED BY 75 V ± 1 AT 400 CPS.

(2) POWER CONSUMPTION: NOT MORE THAN 5.5 MILLIWATTS WHEN EXCITED BY 75 V ± 1 AT 400 CPS. ± 10

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

(2) CERTIFICATE OF COMPLIANCE WITH COLOR REQUIREMENTS.

3. DESIGN:

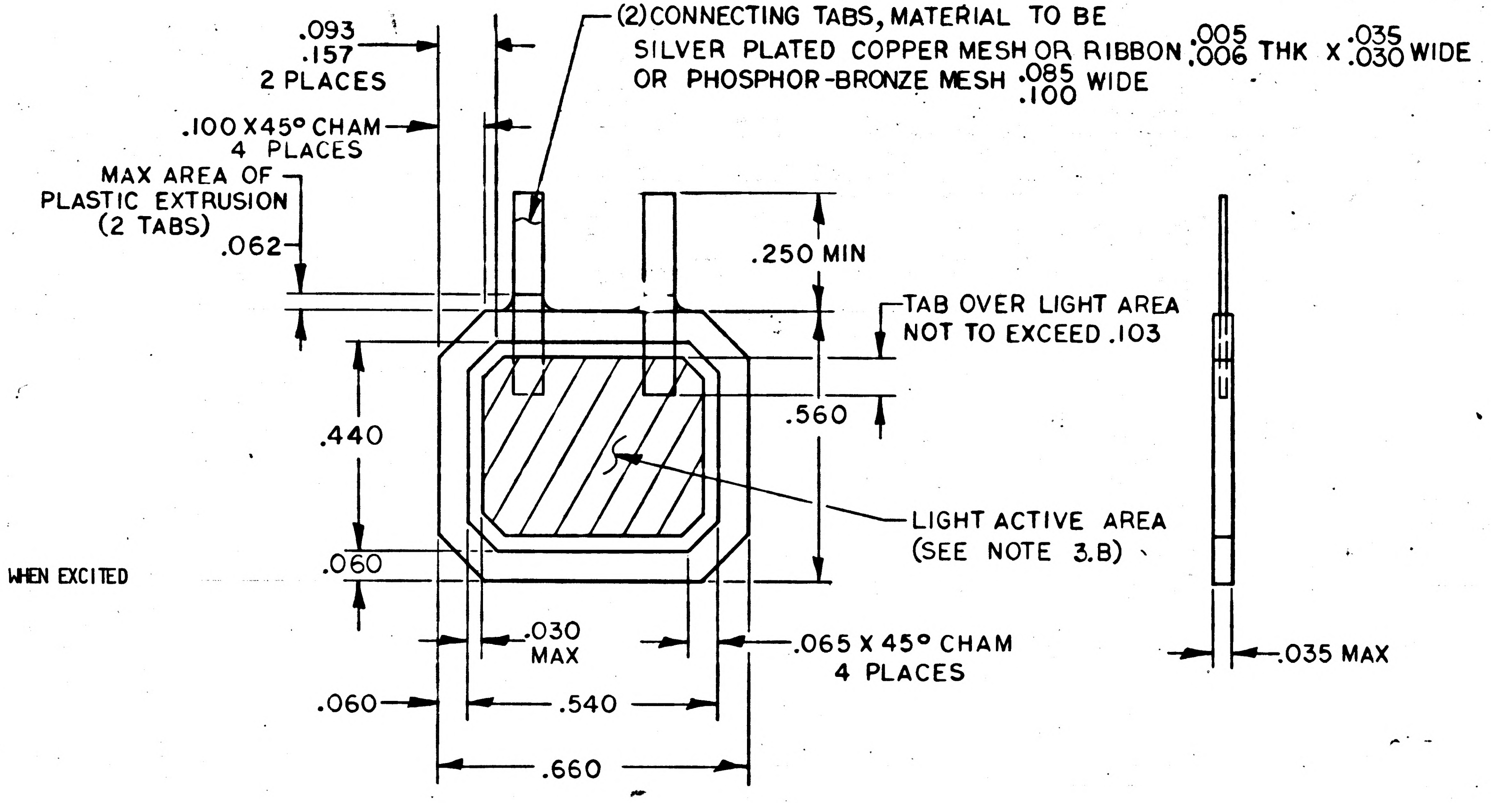
A. CONSTRUCTION: ELECTROLUMINESCENT CELL SANDWICHED AND SEALED BETWEEN TWO SHEETS OF PLASTIC INSULATION.

(1) ELECTRICAL LEADS SHALL BE COPPER MESH OR RIBBON, SILVER PLATED PER QQ-S-365, TYPE 1 GRADE B, OR PHOSPHOR-BRONZE MESH.

B. COLOR: WHITE, WITH COLOR COORDINATES: X = 0.300 ± 0.020; Y = 0.300 ± 0.020 WHEN MEASURED IN ACCORDANCE WITH PROCEDURES OF MIL-L-27160, OR A SATISFACTORY ALTERNATE METHOD.

C. LIFE (DESIGN OBJECTIVE): AFTER 2000 HOURS AT 74°F, 75 V ± 1, 400 CPS ± 10, UNITS SHALL LOSE NOT MORE THAN 75% OF INITIAL INTENSITY: LIGHT OUTPUT SHALL BE NOT LESS THAN 1.5 FOOT-LAMBERTS AFTER LIFE WHEN ENERGIZED BY 115 V ± 1, 400 CPS ± 10.

D. MAXIMUM TEMPERATURE LIMIT: 160°F, OPERATING OR NON-OPERATING. ACCELERATED LIFE DEGRADATION IS EXPERIENCED WITH OPERATION ABOVE 80°F.


(2) CONNECTING TABS, MATERIAL TO BE SILVER PLATED COPPER MESH OR RIBBON .005/.006 THK X .035/.030 WIDE OR PHOSPHOR-BRONZE MESH .085/.100 WIDE
.093/.157 2 PLACES
.100 X 45° CHAM 4 PLACES
MAX AREA OF PLASTIC EXTRUSION (2 TABS)
.062
.250 MIN
TAB OVER LIGHT AREA NOT TO EXCEED .103
.440
.560
LIGHT ACTIVE AREA (SEE NOTE 3.B)
.060
.030 MAX
.065 X 45° CHAM 4 PLACES
.060
.540
.660
.035 MAX

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ANGLES ± 5°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Moran DMB 30MAR65
CHECKED J. Walbourg 30MAR65
APPROVED
APPROVED Eldon C Hall 1 Jun 65
APPROVED MIT W Kupfer 2 Jun 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PANEL, ELECTROLUMINESCENT, PLASTIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006340
SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006340

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 19722			6-2-65	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) TERMINALS (NICKEL MESH): SHALL BE FREE OF PLASTIC OR ANY OTHER CONTAMINANTS WHICH WOULD ADVERSELY AFFECT SPOT WELDED OR SOLDERED CONNECTIONS. THE TERMINAL AREA SHALL COVER THE HOLE COMPLETELY.

   B. ELECTRICAL CHARACTERISTICS:

      (1) LIGHT OUTPUT: 2 FOOT-LAMBERTS MINIMUM WHEN EXCITED BY 75V±1 AT 400 CPS.

      (2) CURRENT: TO BE SPECIFIED.

      (3) POWER FACTOR: TO BE SPECIFIED.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

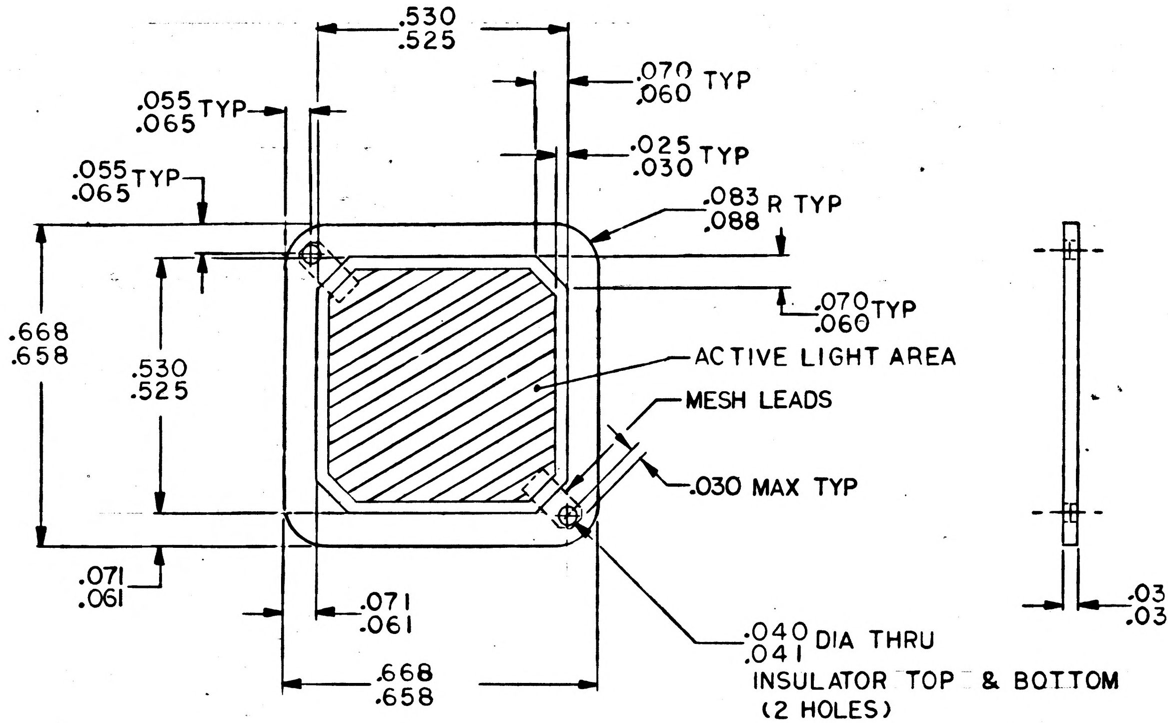
      (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL.

3. DESIGN:

   A. CONSTRUCTION: ELECTROLUMINESCENT CELL SANDWICHED BETWEEN TWO SHEETS OF PLASTIC INSULATION.

      (1) ELECTRICAL LEADS SHALL BE NICKEL MESH. INDIVIDUAL WIRES SHALL BE PURE NICKEL IN ACCORDANCE WITH ND 1015400.

   B. COLOR: WHITE, WITH COLOR COORDINATES: X = 0.330 ± 0.030; Y = 0.330 ± 0.030 WHEN MEASURED IN ACCORDANCE WITH PROCEDURES OF MIL-L-27160.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN D. Money DMB 30MAR65
CHECKED J. Walbourg WBM 30MAR65
APPROVED
APPROVED Eldon C Hall 1 June 65
APPROVED MIT W. Kaffer 2 June 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PANEL, ELECTROLUMINESCENT, PLASTIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 SIZE C DRAWING NO. 1006340

SCALE NONE SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006343 A

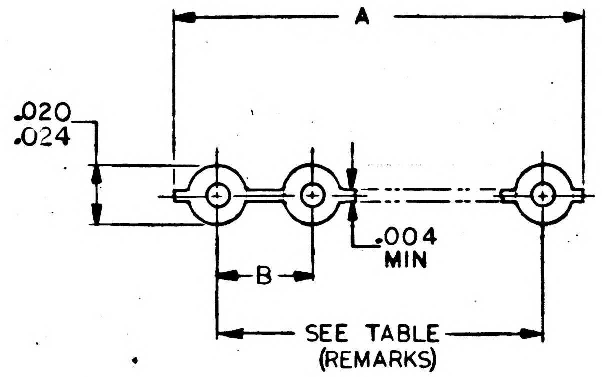
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 20237	6-22-65	WK
A	REVISED PER TDRR 23245	26 Oct 65	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE, OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-C-12000.
     - (1) PACKAGING: LEVEL A; IF COILED, COILS SHALL BE 5 INCH MIN DIAMETER.
     - (2) PACKING: LEVEL B;
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) CONSTRUCTION: WHEN VIEWED UNDER 10X MAGNIFICATION, INSULATION SHALL APPEAR AS A HOMOGENEOUS MASS WITHOUT EVIDENCE OF CRACKS, FLAWS, OR SEPARATION.
     - (3) TEAR STRENGTH BETWEEN ANY LENGTHWISE CONDUCTOR AND ANY OTHER SHALL BE 1 LB. MIN. WHETHER THE WEBBING IS NOTCHED OR UNNOTCHED.
   - B. ELECTRICAL CHARACTERISTICS: TEST PER MIL-W-16878/6
     - (1) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VRMS FOR ONE MINUTE MIN.
     - (2) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM/ 1000 FT OF INDIVIDUAL WIRE AT 500VDC
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION
     - (1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.
     - (2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.
3. DESIGN:
   - A. OPERATION AND/OR STORAGE LIFE: INDEFINITE WITHOUT EMBRITTLEMENT OF CONDUCTORS OR PLASTIC INSULATION AT TEMPERATURES 200°C TO -55°C.
   - B. CONSTRUCTION: A MULTIPLICITY OF NO. 30 AWG SOLID PURE NICKEL (NO GOLD PLATING) (PER ND 1015400) CONDUCTORS ARRANGED IN A FLAT STRIP WHICH HAS A HOMOGENEOUS POLYTETRAFLUOROETHYLENE (TFE) INSULATION AROUND EACH CONDUCTOR AND AN INTER-CONNECTING WEB WHICH CAN BE SLIT TO SEPARATE THE INSULATED CONDUCTORS. ETCH SURFACE FOR POTTING PER ND1002146
   - C. ELECTRICAL CHARACTERISTICS: PER MIL-W-16878/6
     - (1) DIELECTRIC CONSTANT: 2.2 MAXIMUM
     - (2) POWER FACTOR: 0.005 (0.5%) MAXIMUM
     - (3) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM
   - D. WORKING VOLTAGE: 250 VOLTS RMS
4. LENGTH TO BE AS SPECIFIED ON PURCHASE ORDER.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

DASH NO.	DIM A MAX.	DIM B	NO. COND (SOLID)	INSULATION COLOR	REMARKS
-001	.210	.032 ±.003	6	(BLACK)	—
-002	.385	.032 ±.003	11	(BLACK)	—
-003	.105	.032 ±.003	3	(BLACK)	—
-004	.070	.032 ±.003	2	(BLACK)	—
-005	.315	.032 ±.003	9	(BLACK)	—
-006	.140	.032 ±.003	4	(BLACK)	—
-007	2.78	.110 ±.010	24	(BLACK)	



MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D. Young DMS DATE 12 APR 65
CHECKED Tom Adams 13 APR 65 DRM
APPROVAL D. Dungan 6/11/65
APPROVAL Eldon C. Hall 18 June 65
NASA APPROVAL 6/4/65
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, FLAT, TEFLON,
SOLID NICKEL CONDUCTOR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006343
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006343

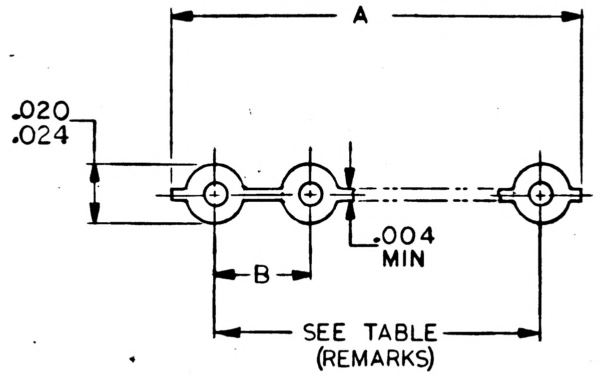
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 20237	6-22-65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-C-12000.
     - (1) PACKAGING: LEVEL A; IF COILED, COILS SHALL BE 5 INCH MIN DIAMETER.
     - (2) PACKING: LEVEL B;
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) CONSTRUCTION: WHEN VIEWED UNDER 10X MAGNIFICATION, INSULATION SHALL APPEAR AS A HOMOGENEOUS MASS WITHOUT EVIDENCE OF CRACKS, FLAWS, OR SEPARATION.
     - (3) TEAR STRENGTH BETWEEN ANY LENGTHWISE CONDUCTOR AND ANY OTHER SHALL BE 1 LB. MIN. WHETHER THE WEBBING IS NOTCHED OR UNNOTCHED.
   - B. ELECTRICAL CHARACTERISTICS: TEST PER MIL-W-16878/6
     - (1) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VRMS FOR ONE MINUTE MIN.
     - (2) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM/ 1000 FT OF INDIVIDUAL WIRE AT 500VDC
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION
     - (1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.
     - (2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.
3. DESIGN:
   - A. OPERATION AND/OR STORAGE LIFE: INDEFINITE WITHOUT EMBRITTLEMENT OF CONDUCTORS OR PLASTIC INSULATION AT TEMPERATURES 200°C TO -55°C.
   - B. CONSTRUCTION: A MULTIPLICITY OF NO. 30 AWG SOLID PURE NICKEL (NO GOLD PLATING) (PER ND 1015400) CONDUCTORS ARRANGED IN A FLAT STRIP WHICH HAS A HOMOGENEOUS POLYTETRAFLUOROETHYLENE (TFE) INSULATION AROUND EACH CONDUCTOR AND AN INTER-CONNECTING WEB WHICH CAN BE SLIT TO SEPARATE THE INSULATED CONDUCTORS. ETCH SURFACE FOR POTTING PER ND1002146
   - C. ELECTRICAL CHARACTERISTICS: PER MIL-W-16878/6
     - (1) DIELECTRIC CONSTANT: 2.2 MAXIMUM
     - (2) POWER FACTOR: 0.005 (0.5%) MAXIMUM
     - (3) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM
   - D. WORKING VOLTAGE: 250 VOLTS RMS
4. LENGTH TO BE AS SPECIFIED ON PURCHASE ORDER.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

DASH NO.	DIM A MAX.	DIM B	NO. COND (SOLID)	INSULATION COLOR	REMARKS
-001	.200	.032 ±.003	6	(BLACK)	—
-002	.360	.032 ±.003	11	(BLACK)	—
-003	.100	.032 ±.003	3	(BLACK)	—
-004	.066	.032 ±.003	2	(BLACK)	—
-005	.295	.032 ±.003	9	(BLACK)	—
-006	.133	.032 ±.003	4	(BLACK)	—
-007	2.660	.110 ±.010	24	(BLACK)	B DIM TOL NON ACCUMALATIVE



MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D. Young DMS DATE 12APR65
CHECKED WJM 13APR65
APPROVAL 6/11/65
APPROVAL Eldon C. Hall 18 Jun 65
NASA APPROVAL 6/24/65
MIT APPROVAL
MIT APPROVAL 22 Jun 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, FLAT, TEFLON, SOLID NICKEL CONDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006343
SCALE NONE	WT	SHEET 1 OF 1

1006343

4	3	2	1

—	1006345

			REVISIONS				
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 20103		-	6-10-65	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-V-45363 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   D. PART MARKING: PARTS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, PART NUMBER, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

   E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3, 4, & 7.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      (1) DIMENSIONS: AS SPECIFIED HEREIN.

      (2) MARKING: AS SPECIFIED IN NOTES 1.D & 1.E

      (3) SEAL: WHEN PROPERLY INSTALLED IN A MOUNTING HOLE .375-.380 DIAMETER IN A PANEL HAVING A SURFACE ROUGHNESS OF 63✓, THE VALVE WITH CORE, CAP, AND "O" RING ASSEMBLED SHALL EXHIBIT A LEAK RATE OF LESS THAN 10^{-8} CC/SEC OF DRY NITROGEN UNDER AN INTERNAL PRESSURE DIFFERENTIAL OF +20 PSI.

   B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

      (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

      (2) CERTIFICATE OF COMPLIANCE WITH SEALING CAPABILITY REQUIREMENTS.

3. DESIGN:

   A. OPERATING LIFE: 1 YEAR MINIMUM WHEN PROPERLY INSTALLED [NOTE 2.A.(3)]

   B. STORAGE LIFE: 6 MONTHS MINIMUM FROM DATE OF SHIPMENT WHEN STORED AT 77° ± 10°F AND 50 ± 10% RH. SEALING ABILITY SHALL NOT BE IMPAIRED.

   C. CONSTRUCTION: STANDARD AUTOMOBILE-TYPE VALVE PER MIL-V-45363 EXCEPT FOR THE FOLLOWING:

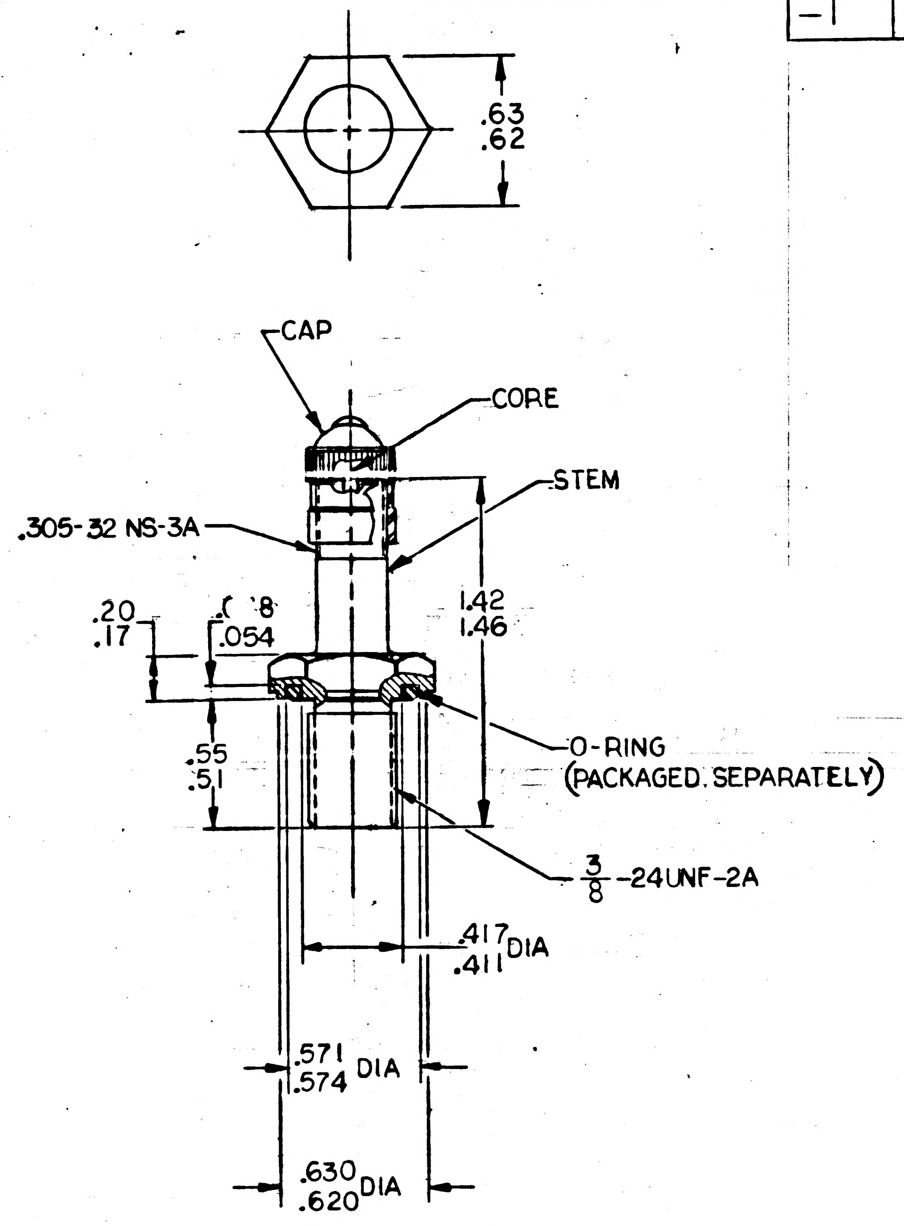
      (1) BASE DESIGN: AS DELINEATED.

      (2) CAP AND CORE RUBBER MATERIAL: BUTYL RUBBER PER AMS 3238B.

      (3) O-RING SEAL: SILICONE OR BUTYL RUBBER (NASA PART 1000159-14 REFERENCE).

      (4) VALVE CAP: NICKEL PLATE PER QQ-N-290, TYPE V.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	W. Fellenberg	28 Apr 65
CHECKED	A. Cazzaniga	7 May 65
APPROVED		
APPROVED	Eldon C Hall	14 June 65
APPROVED MIT	M G Mirsky	6-15-65
APPROVED MSC		6/15/65
		DATE

VALVE, PNEUMATIC TANK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006345
SCALE NONE		SHEET 1 OF 1

4	3	2	1

1006347 A

SYM	DESCRIPTION	DATE	APPROVED
-	INITIAL RELEASE CLASS A PER TDRR 20102	6-15-65	WK.
A	REVISED PER TDRR 21322	[illegible]	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2

   C. PART MARKING: UNITS SHALL BE MARKED: PER ND 1002019, USING INK PER 1010920 ON THE SURFACE(S) INDICATED: WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I , CODE 1 .

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

2. ACCEPTANCE & INSPECTION (100%)

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.

      (3) COMPRESSION: RUBBER SEAL PORTION SHALL BE CAPABLE OF BEING COMPRESSED TO THE LEVEL OF THE PLATE WITHOUT DAMAGE.

      (4) SURFACE ROUGHNESS 125√

   B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.

      (2) CERTIFICATE OF COMPLIANCE FOR ND1015404, CLASS 2

3. DESIGN:

   A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77 ± 5°F AND 50% RH).

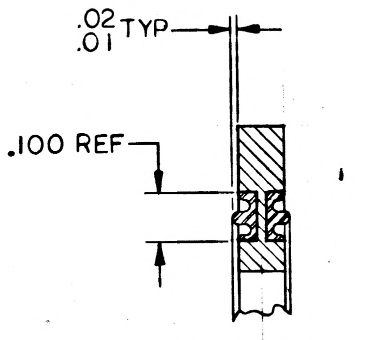
   B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.

      (1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, CHROMATE PER MIL-C-5541, TYPE II, GRADE C, CLASS 3

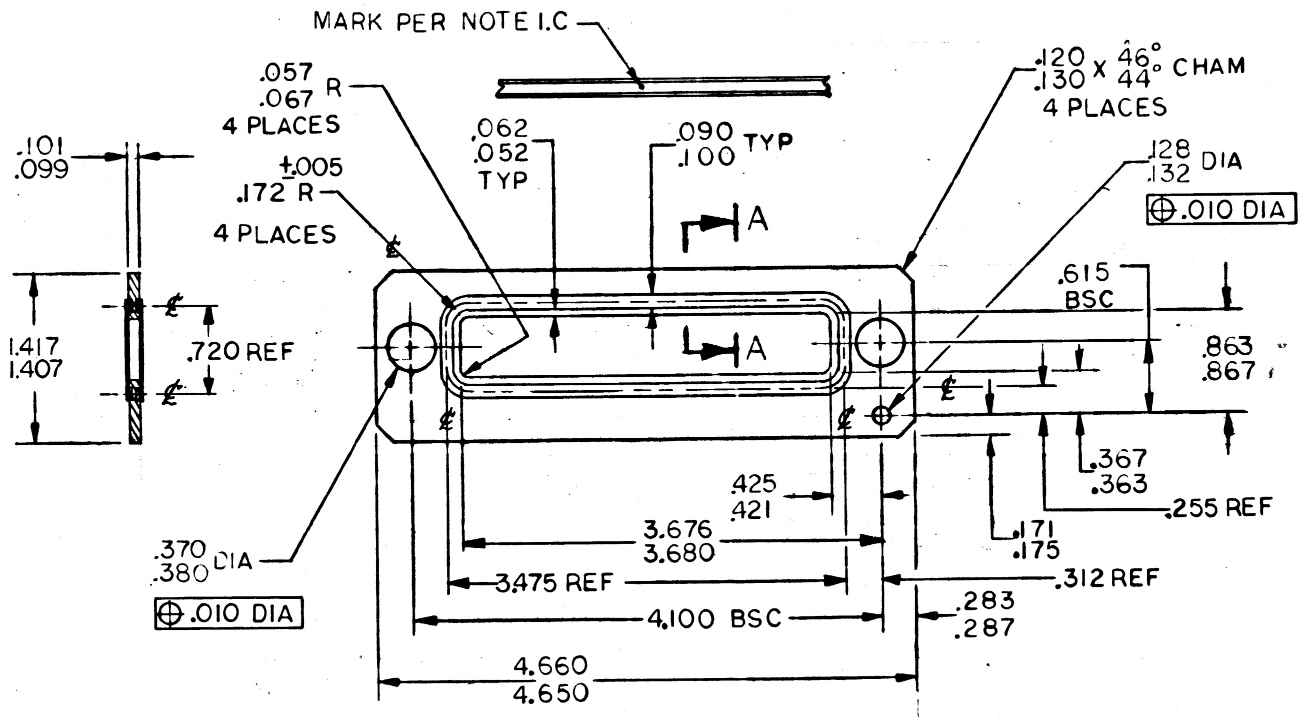
      (2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238A.

      (3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-785).

   C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 2 ATMOSPHERES.



SECTION A-A ENLARGED



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±
DECIMALS .xxx ±
ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN W. Sellenberg DATE 26 APR 65
CHECKED Tom Corian 17 MAY 65
APPROVAL
APPROVAL Eldon C Hall 14 June 65
APPROVAL
NASA APPROVAL
MIT APPROVAL M G Mesley 6-15-65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET PLATE,
BONDED RUBBER, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006347
SCALE NONE
WT
SHEET 1 OF 1

1006347 A

— 1006347

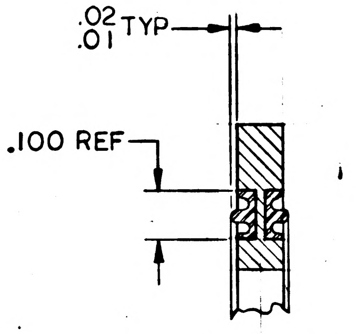
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	INITIAL RELEASE CLASS A PER TDRR 20102	6-15-65	

REQUIREMENTS:

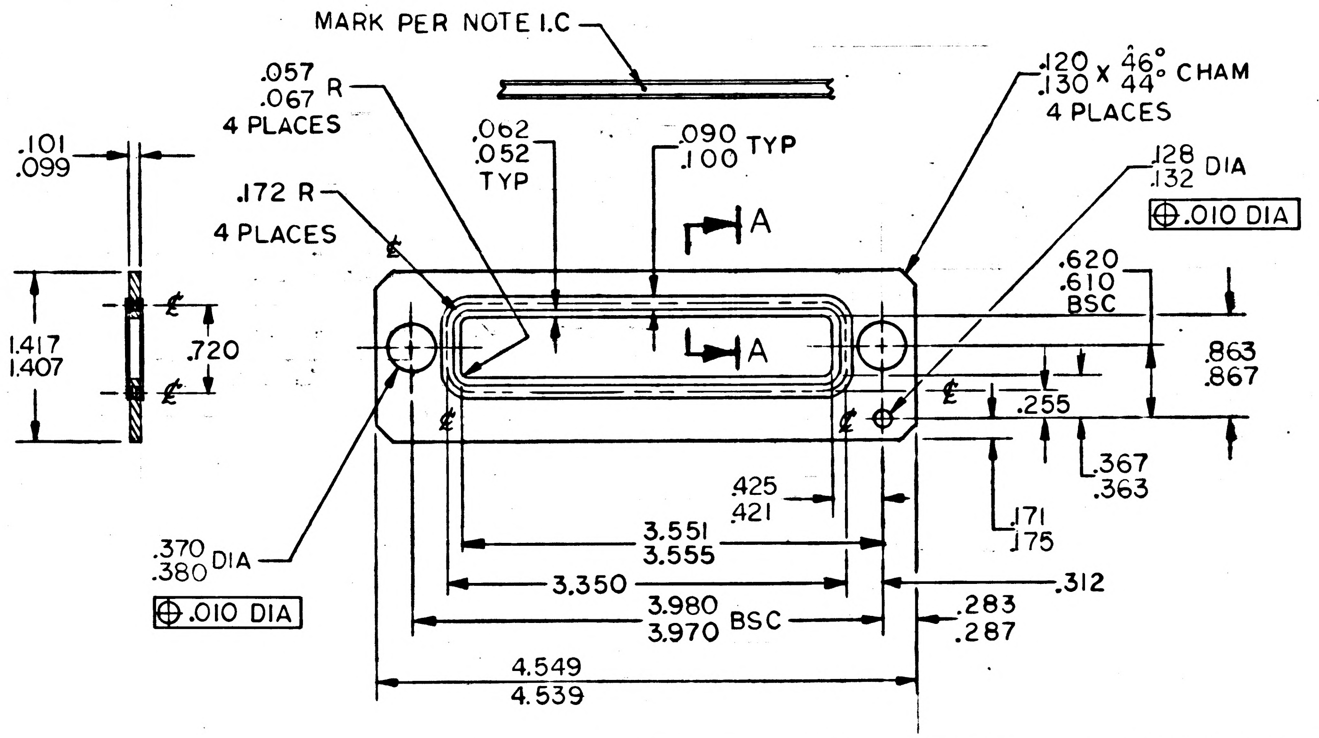
1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2
   C. PART MARKING: UNITS SHALL BE MARKED: PER ND 1002019, USING INK PER 1010920 ON THE SURFACE(S) INDICATED: WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I , CODE 1.
      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

2. ACCEPTANCE & INSPECTION (100%)
   A. MECHANICAL PROPERTIES:
      (1) DIMENSIONS: AS DELINEATED HEREIN.
      (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.
      (3) COMPRESSION: RUBBER SEAL PORTION SHALL BE CAPABLE OF BEING COMPRESSED TO THE LEVEL OF THE PLATE WITHOUT DAMAGE.
      (4) SURFACE ROUGHNESS 125✓
   B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
      (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.
      (2) CERTIFICATE OF COMPLIANCE FOR ND1015404, CLASS 2

3. DESIGN:
   A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77 ± 5°F AND 50% RH).
   B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.
      (1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, CHROMATE PER MIL-C-5541, TYPE II, GRADE C, CLASS 3
      (2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238A.
      (3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-785).
   C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL THE RUBBER SEAL SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 2 ATMOSPHERES.



SECTION A-A
ENLARGED



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN W Sellenberg DATE 26 APR 65
CHECKED Tom O'Brian 7 MAY 65
APPROVAL D Dagg
APPROVAL Eldon C Hall 14 June 65
APPROVAL
NASA APPROVAL W Michael 6/17/65
MIT APPROVAL M G Mickey 6-15-65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET PLATE,
BONDED RUBBER, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006347
SCALE NONE	WT	SHEET 1 OF 1

–	1006349

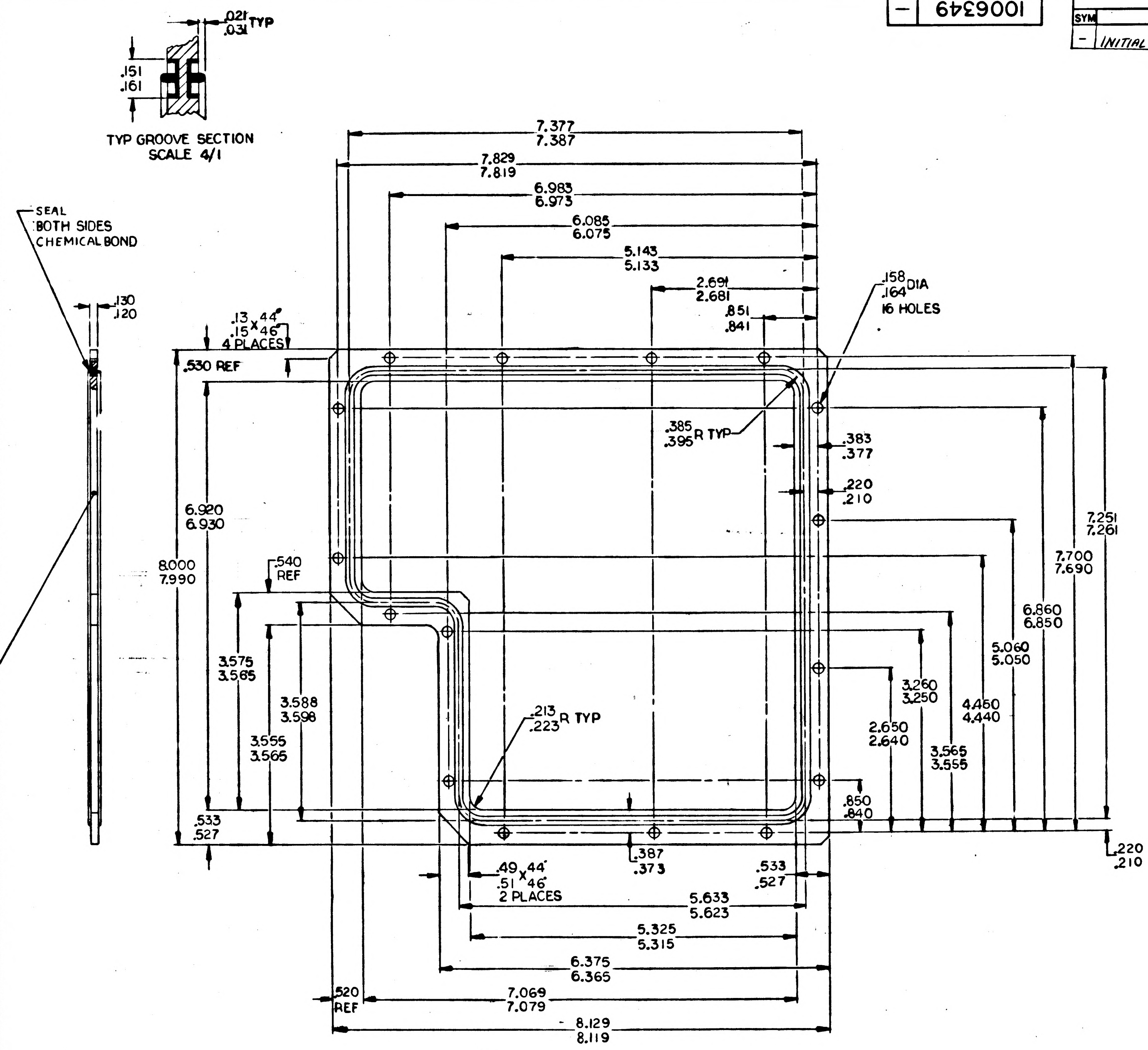
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
–	INITIAL RELEASE CLASS A PER TORR 19686	5-26-65	WK

REQUIREMENTS:

1. **GENERAL:**
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. PART MARKING: UNITS SHALL BE MARKED: PER ND 1002019, ON THE SURFACE(S) INDICATED: WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

2. **ACCEPTANCE & INSPECTION (100%)**
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.
     - (3) COMPRESSION: RUBBER SEAL PORTION SHALL BE CAPABLE OF BEING COMPRESSED TO THE LEVEL OF THE PLATE WITHOUT DAMAGE.
     - (4) SURFACE ROUGHNESS 125 ✓
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.
     - (2) CERTIFICATE OF COMPLIANCE TO 1015404 CLASS 2

3. **DESIGN:**
   - A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77 ± 5°F AND 50% RH).
   - B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.
     - (1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, BLACK ANODIZED PER MIL-A-8625, TYPE II, COLOR BLACK.
     - (2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238.
     - (3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-785).
   - C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL, THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 2 ATMOSPHERES.


MARK PER NOTE 1.C
.021 .031 TYP
.151 .161
TYP GROOVE SECTION
SCALE 4/1
SEAL BOTH SIDES CHEMICAL BOND
.130 .120
7.377 7.387
7.829 7.819
6.983 6.973
6.085 6.075
5.143 5.133
2.691 2.681
.851 .841
.158 .164 DIA 16 HOLES
.13 .15 X 44° 46° 4 PLACES
.530 REF
.385 .395 R TYP
.383 .377
.220 .210
6.920 6.930
8.000 7.990
.540 REF
7.251 7.261
7.700 7.690
6.860 6.850
5.060 5.050
3.575 3.565
3.588 3.598
3.555 3.565
.213 .223 R TYP
3.260 3.250
2.650 2.640
4.460 4.440
3.565 3.555
.850 .840
.533 .527
.387 .373
.49 .51 X 44° 46° 2 PLACES
.533 .527
.220 .210
5.633 5.623
5.325 5.315
6.375 6.365
.520 REF
7.069 7.079
8.129 8.119

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT
DRAWN J. Nazzaro DATE 5 MAY 65
CHECKED ABM 65
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 26 May 65
NASA APPROVAL 5/24/65
MIT APPROVAL
MIT APPROVAL 26 May 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, BONDED, RUBBER,
RETAINED.
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006349
SCALE 1/1
WT
SHEET 1 OF 1

1006350 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE CLASS A PER TDRR 20100	6-15-65	
A	REVISED PER TDRR 22129	9/H	CAL

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3

C. PART MARKING: IDENTIFY PER ND 1002019.
THE SURFACE(S) INDICATED: WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

2. ACCEPTANCE & INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.

(3) COMPRESSION: RUBBER SEAL PORTION SHALL BE CAPABLE OF BEING COMPRESSED TO THE LEVEL OF THE PLATE WITHOUT DAMAGE.

(4) SURFACE ROUGHNESS 125✓ PER MIL-STD-10

B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.

(2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 3.

3. DESIGN:

A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77° ± 5°F AND 50% RH).

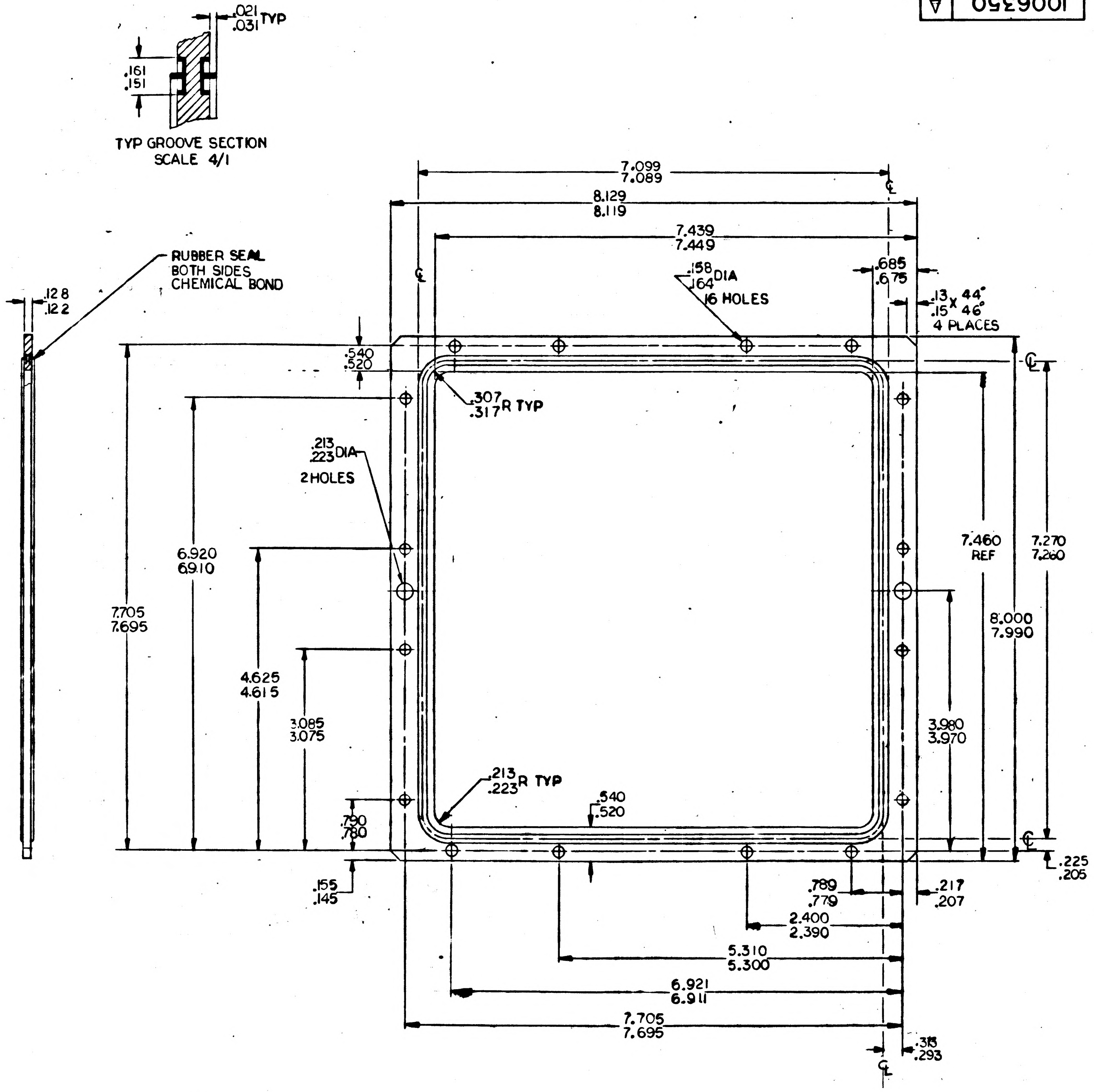
B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.

(1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, CHROMATE FILM PER MIL-C-5541, TYPE II, CLASS 3.

(2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238A.

(3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-785).

C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL, THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 2×10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 2 ATMOSPHERES AND A TEMPERATURE OF -10° TO 82°C.


.021
.031 TYP
.161
.151
TYP GROOVE SECTION
SCALE 4/1
RUBBER SEAL
BOTH SIDES
CHEMICAL BOND
.128
.122
7.099
7.089
8.129
8.119
7.439
7.449
.158
.164 DIA
16 HOLES
.685
.675
.13 X 44°
.15 X 46°
4 PLACES
.540
.520
.307
.317 R TYP
.213
.223 DIA
2 HOLES
7.460
REF
7.270
7.260
6.920
6.910
7.705
7.695
8.000
7.990
4.625
4.615
3.085
3.075
3.980
3.970
.213
.223 R TYP
.540
.520
.790
.780
.155
.145
.225
.205
.789
.779
.217
.207
2.400
2.390
5.310
5.300
6.921
6.911
7.705
7.695
.313
.293
℄

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO.
CONTRACT
DRAWN DATE 6 MAY 65
CHECKED
APPROVAL
APPROVAL Eldon C Hall 9 June 65
APPROVAL
NASA APPROVAL 6/15/65
MIT APPROVAL 6-15-65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, BONDED, RUBBER, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1006350
SCALE 1/1
WT
SHEET 1 OF 1

1006350 A

—	1006350

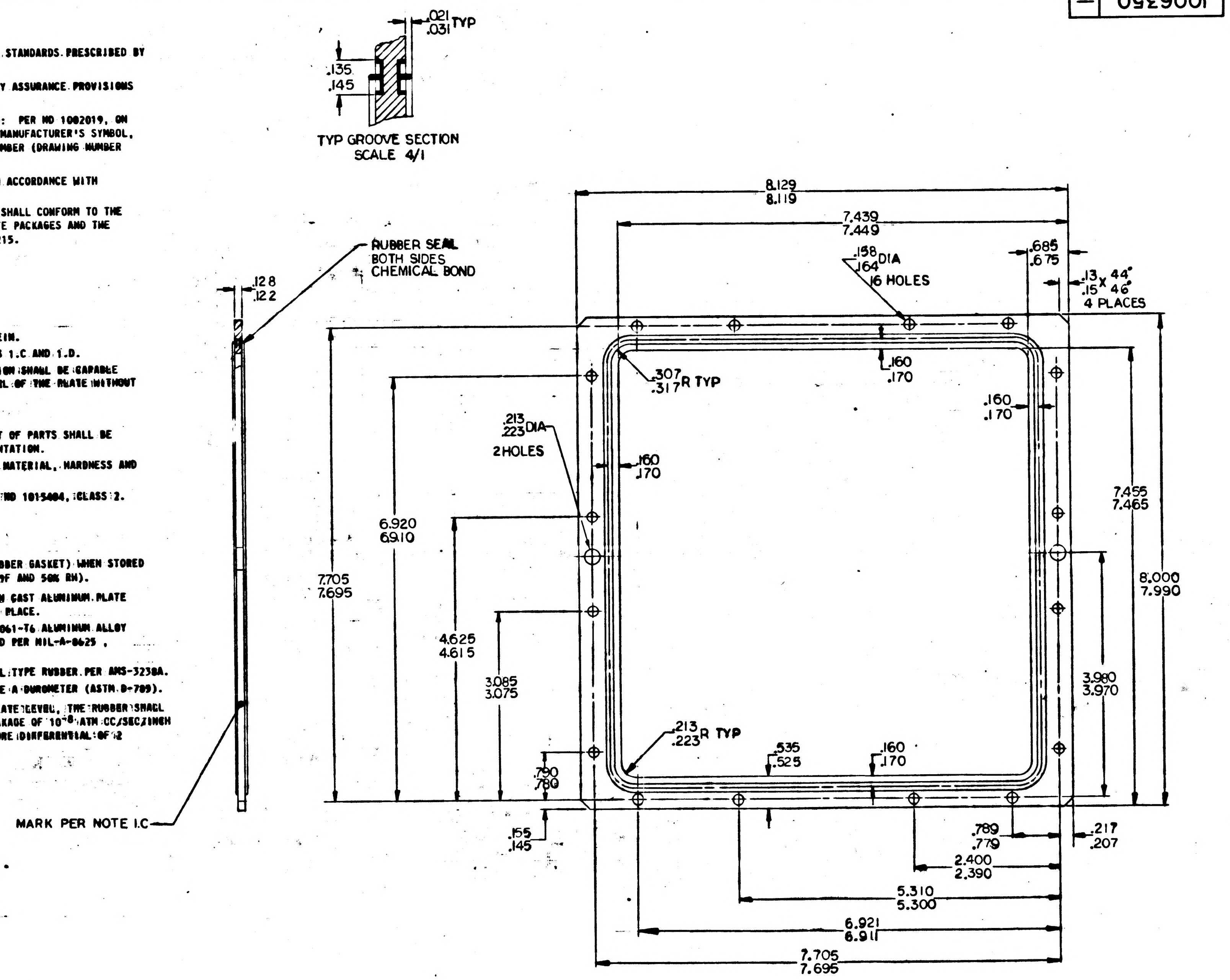
SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE CLASS A PER TDRR 20100	6-15-65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. PART MARKING: UNITS SHALL BE MARKED: PER ND 1002019, ON THE SURFACE(S) INDICATED: WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

2. ACCEPTANCE & INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.
     - (3) COMPRESSION: RUBBER SEAL PORTION SHALL BE CAPABLE OF BEING COMPRESSED TO THE LEVEL OF THE PLATE WITHOUT DAMAGE.
     - (4) SURFACE ROUGHNESS 125√
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.
     - (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:
   - A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77° ± 5°F AND 50% RH).
   - B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.
     - (1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, BLACK ANODIZED PER MIL-A-8625, TYPE II, COLOR BLACK.
     - (2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238A.
     - (3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-705).
   - C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL, THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 2 ATMOSPHERES.


.021
.031 TYP
.135
.145
TYP GROOVE SECTION
SCALE 4/1
RUBBER SEAL
BOTH SIDES
CHEMICAL BOND
.128
.122
MARK PER NOTE I.C
8.129
8.119
7.439
7.449
.158
.164 DIA
16 HOLES
.685
.675
.13 X 44°
.15 X 46°
4 PLACES
.307
.317 R TYP
.160
.170
.160
.170
.213
.223 DIA
2 HOLES
.160
.170
6.920
6.910
7.705
7.695
4.625
4.615
3.085
3.075
.790
.780
.213
.223 R TYP
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.525
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.170
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8.000
7.990
3.980
3.970
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.145
.789
.779
.217
.207
2.400
2.390
5.310
5.300
6.921
6.911
7.705
7.695

A. PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN DATE 6 MAY 65
CHECKED CC 17 MAY 65
APPROVAL
APPROVAL Eldon C Hall
APPROVAL
NASA APPROVAL 6/15/65
MIT APPROVAL M G Whaley 6-15-65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, BONDED, RUBBER, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	D	1006350
SCALE 1/1	WT	SHEET 1 OF 1

1006351 A

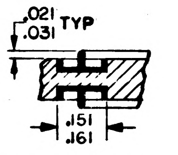
SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE CLASS A PER TDRR 19688	5-26-65	WH
A	REVISED PER TDRR 22131	9/14	MGM

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3
   - C. PART MARKING: IDENTIFY PER ND1002019 WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

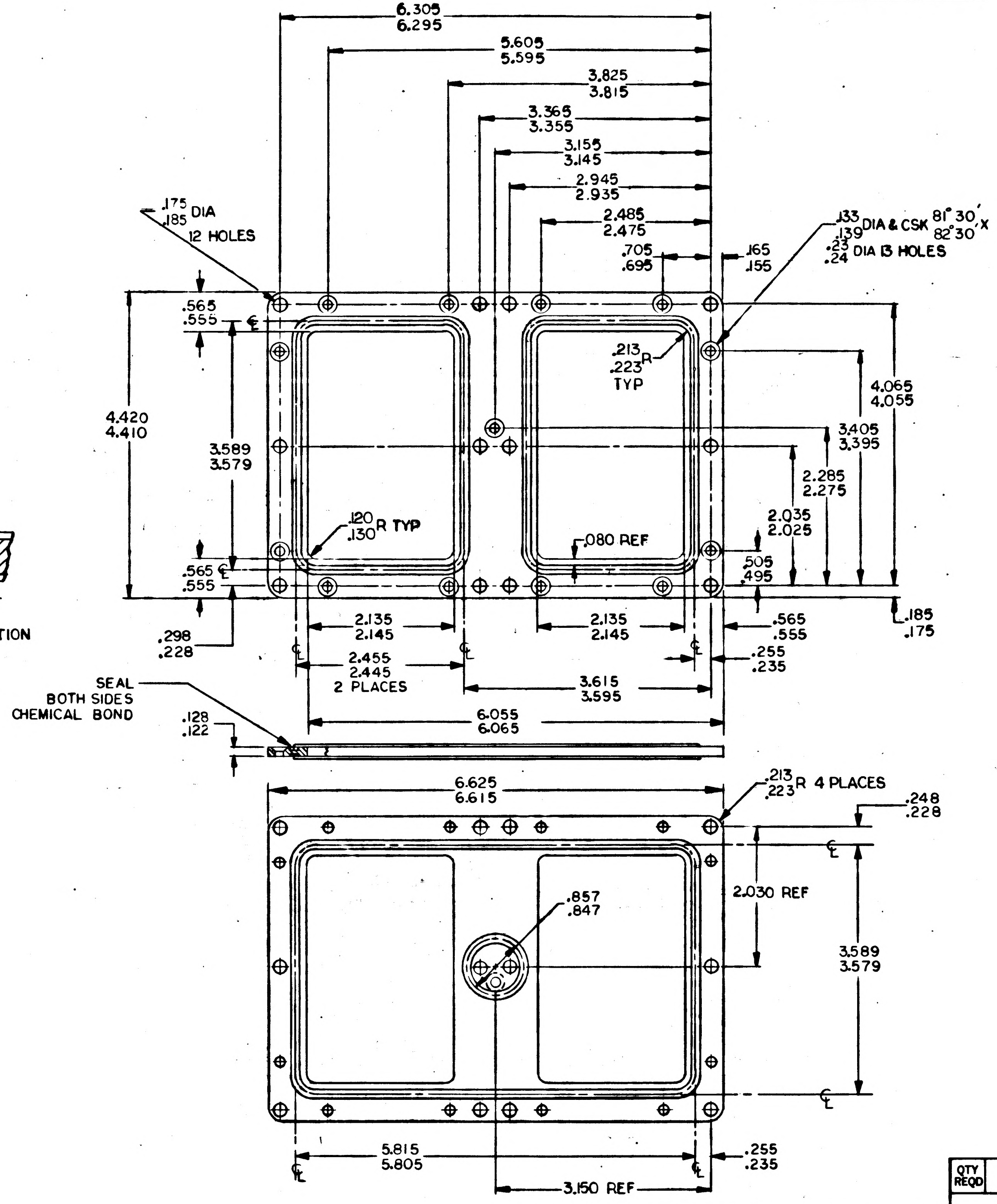
2. ACCEPTANCE & INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.
     - (3) COMPRESSION: RUBBER SEAL PORTION SHALL BE CAPABLE OF BEING COMPRESSED TO THE LEVEL OF THE PLATE WITHOUT DA[illegible]S.
     - (4) SURFACE ROUGHNESS 125√ PER MIL-STD-10
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.
     - (2) CERTIFICATE OF COMPLIANCE WITH 1015404 CLASS 3

3. DESIGN:
   - A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77 ± 5°F AND 50% RH).
   - B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.
     - (1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, CHROMATE FILM PER MIL-C-5541 TYPE II, CLASS 3
     - (2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238.
     - (3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-785).
   - C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL, THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 2×10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 2 ATMOSPHERES AND A TEMPERATURE OF -10° TO 82°C



.021
.031 TYP
.151
.161

TYP GROOVE SECTION
SCALE 4/1



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3.150 REF

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN [illegible] DATE 6 MAY 65
CHECKED [illegible] 7 MAY 65
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 26 May 65
NASA APPROVAL [illegible] 5/26/65
MIT APPROVAL
MIT APPROVAL [illegible] 26 May 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, BONDED, RUBBER,
RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	D	1006351
SCALE 1/1	WT	SHEET 1 OF 1

1006351 A

— 1006351

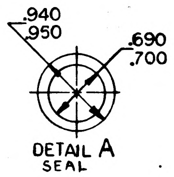
SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE CLASS A PER TDRR 1688	5-26-65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. PART MARKING: UNITS SHALL BE MARKED: PER ND 1002019, ON THE SURFACE(S) INDICATED: WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I , CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING PER ND 1002215.

2. ACCEPTANCE & INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.C AND 1.D.
     - (3) COMPRESSION: RUBBER SEAL PORTION SHALL BE CAPABLE OF BEING COMPRESSED TO THE LEVEL OF THE PLATE WITHOUT DAMAGE.
     - (4) SURFACE ROUGHNESS $\overset{125}{\surd}$
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL, HARDNESS AND FINISH REQUIREMENTS.
     - (2) CERTIFICATE OF COMPLIANCE WITH 1015404 CLASS 2

3. DESIGN:
   - A. STORAGE LIFE: ONE YEAR MINIMUM (RUBBER GASKET) WHEN STORED AT ORDINARY ROOM CONDITIONS (77 ± 5°F AND 50% RH).
   - B. CONSTRUCTION: MACHINED OR PRECISION CAST ALUMINUM PLATE WITH BUTYL RUBBER GASKETS MOLDED IN PLACE.
     - (1) MATERIAL AND FINISH, PLATE: 6061-T6 ALUMINUM ALLOY PER QQ-A-250/11, BLACK ANODIZED PER MIL-A-8625 , TYPE II, COLOR BLACK.
     - (2) MATERIAL, RUBBER GASKET: BUTYL TYPE RUBBER PER AMS-3238 .
     - (3) HARDNESS, RUBBER: 70 ± 5 SHORE A DUROMETER (ASTM D-785).
   - C. SEALING: WHEN COMPRESSED TO THE PLATE LEVEL, THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 2 ATMOSPHERES.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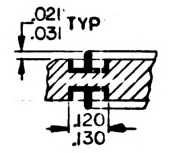
DETAIL A
SEAL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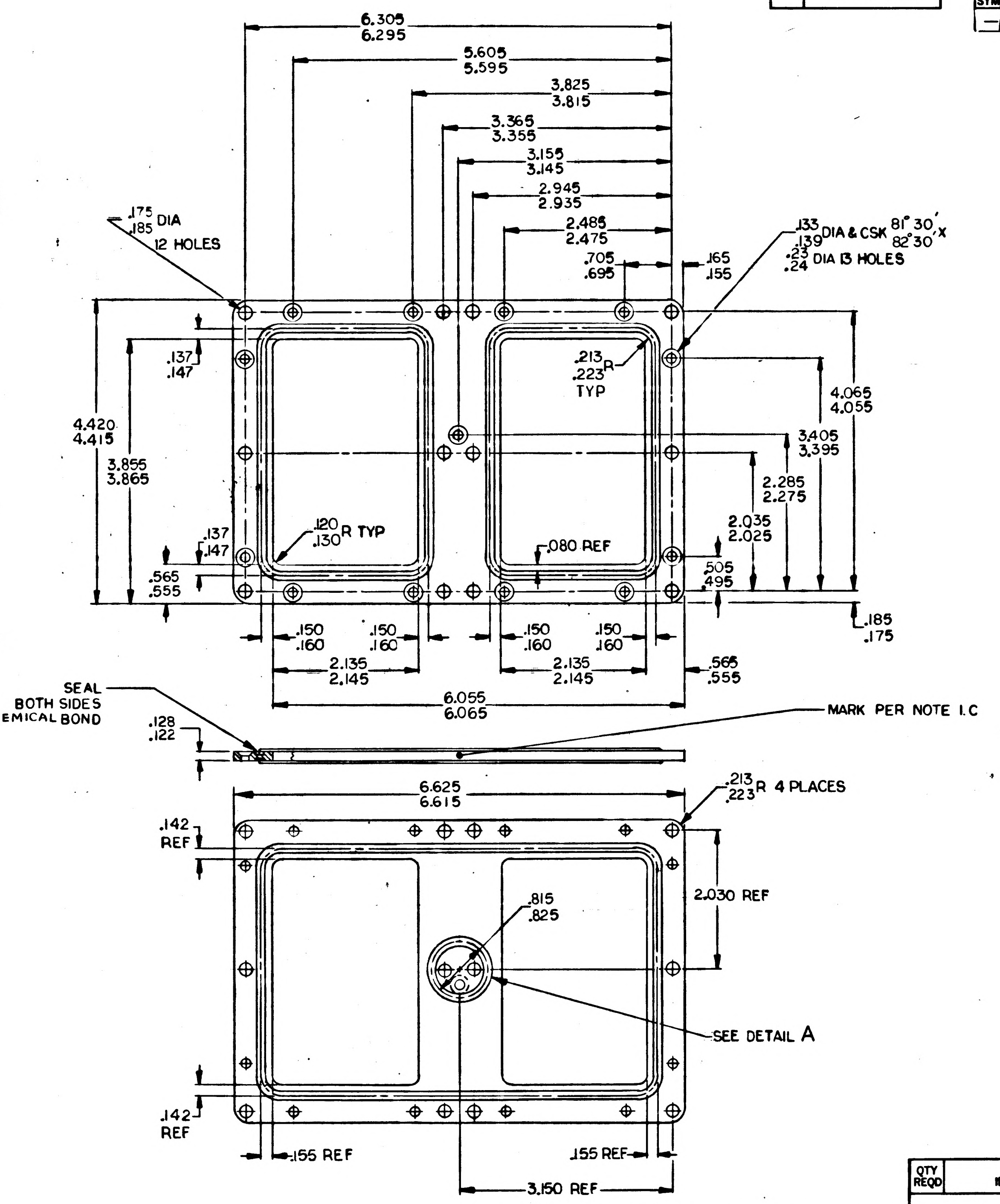
TYP GROOVE SECTION
SCALE 4/1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.705
.695
.165
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.175
.185 DIA
12 HOLES
.133
.139 DIA & CSK 81° 30′
82° 30′ X
.23
.24 DIA 13 HOLES
.137
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.213
.223 R
TYP
4.420
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4.055
3.405
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2.135
2.145
.565
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6.065
SEAL
BOTH SIDES
CHEMICAL BOND
.128
.122
MARK PER NOTE 1.C
6.625
6.615
.213
.223 R 4 PLACES
.142
REF
2.030 REF
.815
.825
SEE DETAIL A
.142
REF
.155 REF
.155 REF
3.150 REF

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN Jon Naggar DATE 6MAY65
CHECKED Lou Calvin 17 MAY 65
APPROVAL
APPROVAL
APPROVAL Eldon C Hall 26 May 65
NASA APPROVAL 5/24/65
MIT APPROVAL
MIT APPROVAL 26 May 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, BONDED, RUBBER,
RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	D	1006351

SCALE 1/1 WT SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 22269			9-8-65	WR
A		REVISED PER TDRR 23458			11/9/65	WR

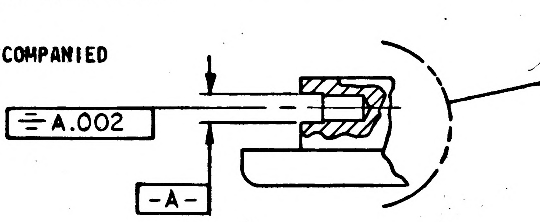
REQUIREMENTS:

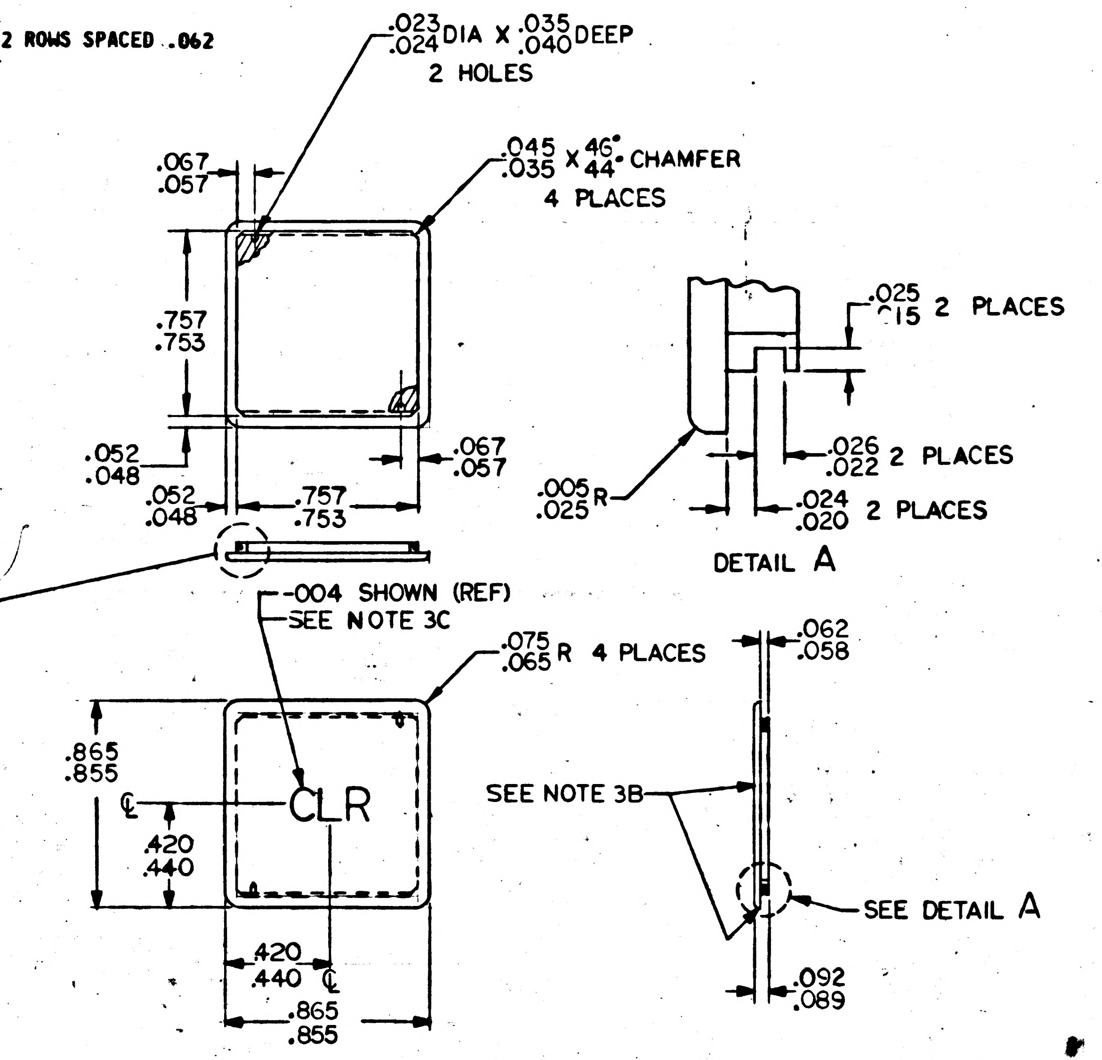
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - C. MARKING: UNITS SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING AS SPECIFIED IN ND 1002215.
   - E. WHEN SUBJECTED TO THE ENVIRONMENTAL REQUIREMENTS OF ND 1002056, UNITS SHALL NOT EXPERIENCE MORE THAN 20% CHANGE OF PHOTOMETRIC PARAMETERS, AND SHALL EXHIBIT NO TOXIC OUTGASSING.
2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. MARKING AND PREPARATION FOR DELIVERY AS SPECIFIED ABOVE AND IN TABLE I.
   - B. DIMENSIONS AND TOLERANCES AS SPECIFIED HEREIN.
   - C. LIGHT DISTRIBUTION THROUGH MARKING: 33% MINIMUM LIGHT TRANSMISSION WHEN BACKLIGHTED WITH AN EL LAMP PER SCD 1006340 LOCATED DIRECTLY BEHIND THE BACK SURFACE OF THE CAP.
   - D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL REQUIREMENTS SPECIFIED HEREIN.
     - (2) A CERTIFICATE OF COMPLIANCE WITH MIL-Q-9858.
3. DESIGN:
   - A. MATERIAL: ACRYLIC PER MIL-P-5425, FINISH A.
   - B. FINISH: BACKGROUND SHALL BE TT-E-527 BLACK LUSTERLESS ENAMEL OR EPOXY COLOR NO. 37038 PER FED-STD-595. CHARACTERS, NON-ILLUMINATED, TO APPEAR WHITE COLOR NO. 37875 PER FED-STD-595.
   - C. MARKINGS: PER TABLE 1 SHALL BE GORTON NORMAL WITH
     - 1. PROPORTIONS PER ND 1002122 TYPE II, CLASS 1 EXCEPT AS NOTED:
       - a) CHARACTER HEIGHT TO BE MEASURED AS OVERALL HEIGHT.
       - b) LINE STROKE WIGTH TO BE .030 FOR .250 HIGH CHARACTERS.
       - c) LINE STROKE WIDTH TO BE .022 FOR .125 HIGH CHARACTERS.
     - 2. FUTURA DEMIBOLD MARKINGS PER ND 1002122 SHALL ALSO BE ACCEPTABLE. THESE SHALL BE MODIFIED TO HAVE STROKE WIDTHS AS IN 3C1.
   - D. COLOR: WHEN BACKLIGHTED PER 2.C., COLOR SHALL BE WHITE, WITH COLOR COORDINATES X = .330 ± .030, Y = .330 ± .030, PER CIE CHROMACITY DIAGRAM.
   - E. CONTRAST: WHITE COLOR IN 3B MAY BE REDUCED IN SATURATION PROVIDED A MINIMUM CONTRAST OF 5 UNITS BETWEEN BLACK BACKGROUND AND UNLIGHTED CHARACTER WHEN MEASURED IN ACCORDANCE WITH MIL-P-7788. FOR CONTRAST MEASUREMENT THE CAP MAY BE BACKED WITH AN EL LAMP PER SCD 1006340 SPACED 0.2 INCHES AWAY.
   - F. GLOSS: SHALL NOT EXCEED 5 UNITS ON EXTERIOR SURFACES, AS MEASURED PER ASTM METHOD D523.

TABLE I

DASH NO.	MARKING	HEIGHT
-001	VERB	.125
-002	NOUN	
-003	ENTR	
-004	CLR	
-005	STBY	
-006	KEY REL	
-007	RSET	.125
-008	+	.250
-009	-	
-010	0	
-011	1	
-012	2	
-013	3	
-014	4	
-015	5	
-016	6	
-017	7	
-018	8	
-019	9	.250

2 ROWS SPACED .062





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. Doty 11/25/1965
CHECKED [illegible] 28 [illegible]
APPROVED
APPROVED Eldon C Hall 9 Sept 65
APPROVED MIT W Kupfer 9 Sep 65
APPROVED MSC NOT REQUIRED PER LETTER NASA PP7-65-612
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAP, ELECTRICAL, ENGRAVED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006353
SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS							
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 22269			9-8-65	WK	
A		REVISED PER TDRR 23458			11/9/65	WK	
B		REVISED PER TDRR 29902	RWH		13 JUL 66		

REQUIREMENTS:

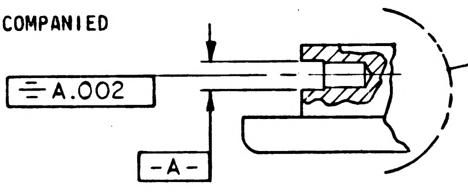
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - C. MARKING: UNITS SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING AS SPECIFIED IN ND 1002215.
   - E. WHEN SUBJECTED TO THE ENVIRONMENTAL REQUIREMENTS OF ND 1002056, UNITS SHALL NOT EXPERIENCE MORE THAN 20% CHANGE OF PHOTOMETRIC PARAMETERS, AND SHALL EXHIBIT NO TOXIC OUTGASSING.
2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. MARKING AND PREPARATION FOR DELIVERY AS SPECIFIED ABOVE AND IN TABLE I.
   - B. DIMENSIONS AND TOLERANCES AS SPECIFIED HEREIN.
   - C. LIGHT DISTRIBUTION THROUGH MARKING: 33% MINIMUM LIGHT TRANSMISSION WHEN BACKLIGHTED WITH AN EL LAMP PER SCD 1006340 LOCATED DIRECTLY BEHIND THE BACK SURFACE OF THE CAP.
   - D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL REQUIREMENTS SPECIFIED HEREIN.
     - (2) A CERTIFICATE OF COMPLIANCE WITH MIL-Q-9858.
3. DESIGN:
   - A. MATERIAL: ACRYLIC PER MIL-P-5425, FINISH A.
   - B. FINISH: BACKGROUND SHALL BE TT-E-527 BLACK LUSTERLESS ENAMEL OR EPOXY COLOR NO. 37038 PER FED-STD-595. CHARACTERS, NON-ILLUMINATED, TO APPEAR WHITE COLOR NO. 37875 PER FED-STD-595.
   - C. MARKINGS: PER TABLE 1 SHALL BE GORTON NORMAL WITH
     1. PROPORTIONS PER ND 1002122 TYPE II, CLASS 1 EXCEPT AS NOTED:
        - a) CHARACTER HEIGHT TO BE MEASURED AS OVERALL HEIGHT.
        - b) LINE STROKE WIGTH TO BE .030 FOR .250 HIGH CHARACTERS.
        - c) LINE STROKE WIDTH TO BE .022 FOR .125 HIGH CHARACTERS.
     2. FUTURA DEMIBOLD MARKINGS PER ND 1002122 SHALL ALSO BE ACCEPTABLE. THESE SHALL BE MODIFIED TO HAVE STROKE WIDTHS AS IN 3C1.
   - D. COLOR: WHEN BACKLIGHTED PER 2.C., COLOR SHALL BE WHITE, WITH COLOR COORDINATES X = .330 ± .030, Y = .330 ± .030, PER CIE CHROMACITY DIAGRAM.
   - E. CONTRAST: WHITE COLOR IN 3B MAY BE REDUCED IN SATURATION PROVIDED A MINIMUM CONTRAST OF 5 UNITS BETWEEN BLACK BACKGROUND AND UNLIGHTED CHARACTER WHEN MEASURED IN ACCORDANCE WITH MIL-P-7788. FOR CONTRAST MEASUREMENT THE CAP MAY BE BACKED WITH AN EL LAMP PER SCD 1006340 SPACED 0.2 INCHES AWAY.
   - F. GLOSS: SHALL NOT EXCEED 5 UNITS ON EXTERIOR SURFACES, AS MEASURED PER ASTM METHOD D523.

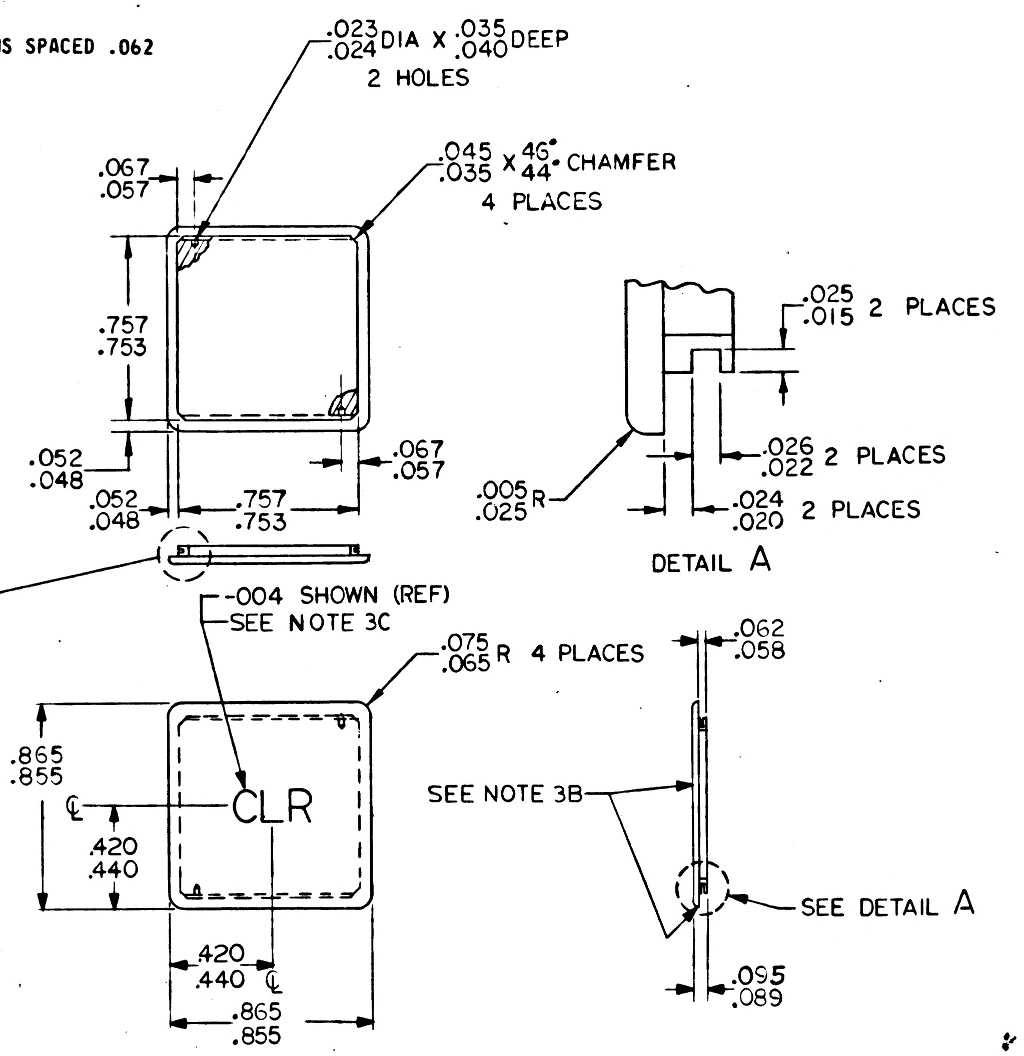
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE I

DASH NO.	MARKING	HEIGHT
-001	VERB	.125
-002	NOUN	↑
-003	ENTR	
-004	CLR	
-005	STBY	
-006	KEY REL	↓
-007	RSET	.125
-008	+	.250
-009	–	↑
-010	0	
-011	1	
-012	2	
-013	3	
-014	4	
-015	5	
-016	6	
-017	7	
-018	8	↓
-019	9	.250

-006: 2 ROWS SPACED .062





QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. Doty 11/25/1965
CHECKED
APPROVED
APPROVED Eldon C Hall 28 Sept 65
APPROVED MIT W Kupfer 8 Sep 65
NOT REQUIRED PER LETTER
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAP, ELECTRICAL, ENGRAVED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006353.
SCALE NONE
SHEET 1 OF 1

1006353 B

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 22269			9-8-65	

REVISIONS

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

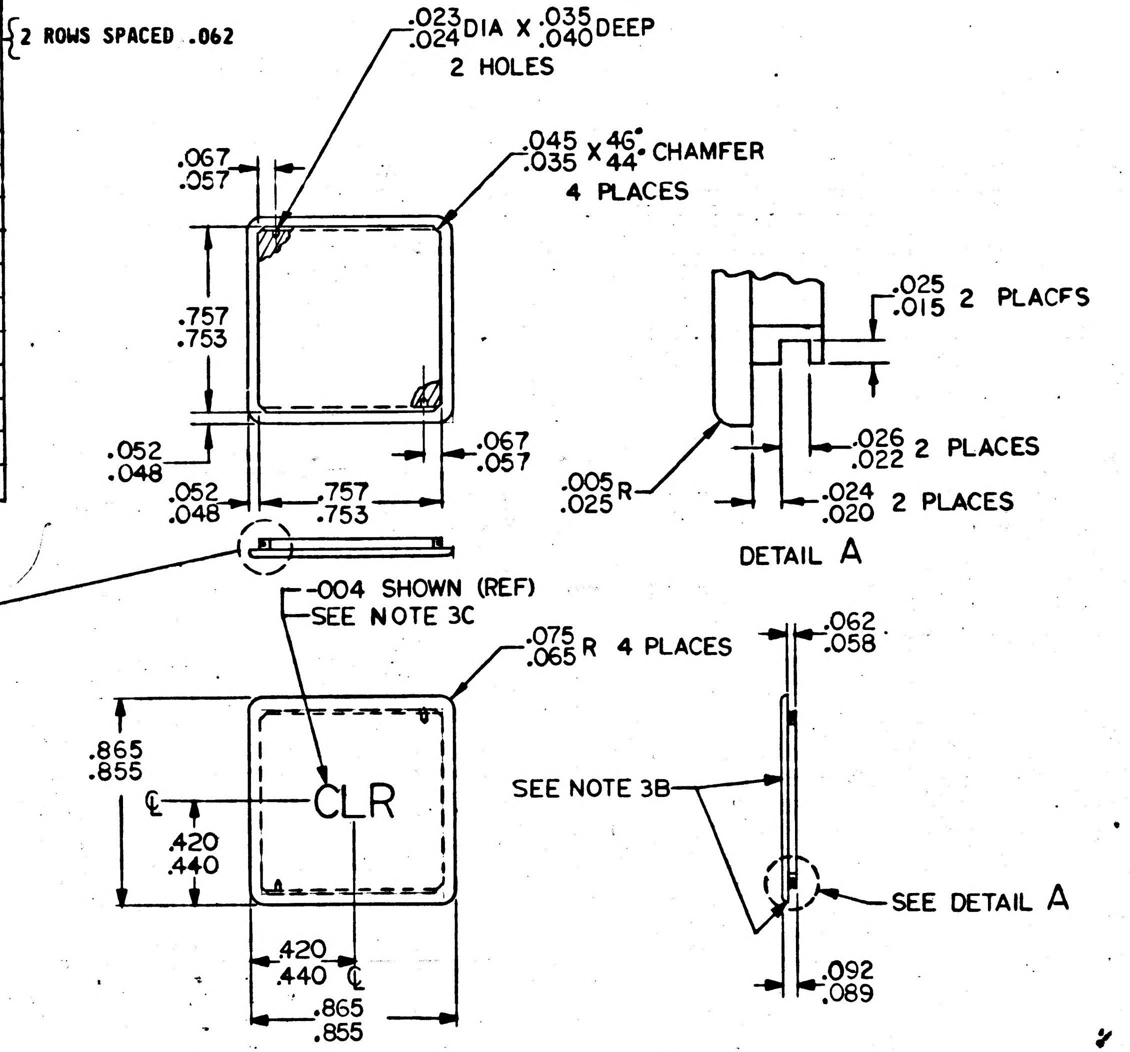
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - C. MARKING: UNITS SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING AS SPECIFIED IN ND 1002215.
   - E. WHEN SUBJECTED TO THE ENVIRONMENTAL REQUIREMENTS OF ND 1002056, UNITS SHALL NOT EXPERIENCE MORE THAN 20% CHANGE OF PHOTOMETRIC PARAMETERS, AND SHALL EXHIBIT NO TOXIC OUTGASSING.
2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. MARKING AND PREPARATION FOR DELIVERY AS SPECIFIED ABOVE AND IN TABLE I.
   - B. DIMENSIONS AND TOLERANCES AS SPECIFIED HEREIN.
   - C. LIGHT DISTRIBUTION THROUGH MARKING: 33% MINIMUM LIGHT TRANSMISSION WHEN BACKLIGHTED WITH AN EL LAMP PER SCD 1006340 LOCATED DIRECTLY BEHIND THE BACK SURFACE OF THE CAP.
   - D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL REQUIREMENTS SPECIFIED HEREIN.
     - (2) A CERTIFICATE OF COMPLIANCE WITH MIL-Q-9858.
3. DESIGN:
   - A. MATERIAL: ACRYLIC PER MIL-P-5425, FINISH A.
   - B. FINISH: BACKGROUND SHALL BE TT-E-527 BLACK LUSTERLESS ENAMEL COLOR NO. 37038 PER FED-STD-595. [illegible] CHARACTERS, NON-ILLUMINATED, TO APPEAR WHITE COLOR NO. 37875 PER FED-STD-595.
   - C. MARKINGS PER TABLE I SHALL BE ENGRAVED THROUGH BLACK PAINT ONLY PER ND 1002019 AND ND 1002122 TYPE II, CLASS 1.
     THIS NOTE ONLY APPLIES IF ENGRAVING IS USED.
   - D. COLOR: WHEN BACKLIGHTED PER 2.C., COLOR SHALL BE WHITE, WITH COLOR COORDINATES X = .330 ± .030, Y = .330 ± .030 PER CIE CHROMACITY DIAGRAM.
   - E. GLOSS: SHALL NOT EXCEED 5 UNITS ON EXTERIOR SURFACES, AS MEASURED PER ASTM METHOD D523.

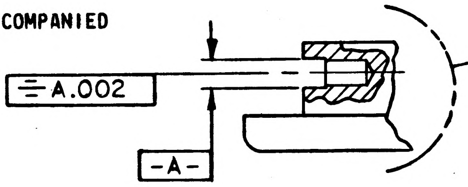
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE I

DASH NO.	MARKING	HEIGHT
-001	VERB	.125
-002	NOUN	↑
-003	ENTR	
-004	CLR	
-005	STBY	
-006	KEY REL	↓
-007	RSET	.125
-008	+	.250
-009	-	↑
-010	0	
-011	1	
-012	2	
-013	3	
-014	4	
-015	5	
-016	6	
-017	7	
-018	8	↓
-019	9	.250

{2 ROWS SPACED .062





QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. Doty Nov/25/1965
CHECKED [illegible] 28 [illegible]
APPROVED
APPROVED Eldon C Hall 7 Sept 65
APPROVED MIT W Kupfer 8 Sep 65
APPROVED MSC NOT REQUIRED PER LETTER NASA PP7-65-612
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAP, ELECTRICAL, ENGRAVED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006353
SCALE NONE
SHEET 1 OF 1

MASTER

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS							
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 20236			6-22-65	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: UNITS SHALL BE MARKED PER ND 1002019 WITH THE PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. MARKING AND PREPARATION FOR DELIVERY AS SPECIFIED ABOVE.

B. DIMENSIONS AND TOLERANCES AS SPECIFIED HEREIN.

C. HERMETIC SEAL BETWEEN METAL AND GLASS SHALL MEET THE REQUIREMENTS OF MIL-S-8484, GRADE A.

D. LEAKAGE RATE: THE LEAKAGE RATE SHALL NOT EXCEED ONE STANDARD CUBIC CENTIMETER OF AIR/YEAR/INCH OF SEAL AT A PRESSURE DIFFERENTIAL OF ONE ATMOSPHERE.

E. VENDOR SUPPLIED DATA: THE FOLLOWING DATA SHALL BE SUPPLIED BY THE VENDOR WITH EACH SHIPMENT.

(1) A CERTIFICATE OF COMPLIANCE WITH MIL-S-8484 GRADE A.

(2) A CERTIFICATE OF COMPLIANCE WITH ND 1015404 CLASS 3.

(3) LEAKAGE RATE TEST DATA.

(4) A CERTIFICATE OF COMPLIANCE WITH FINISHAL AND FINISH REQUIREMENTS.

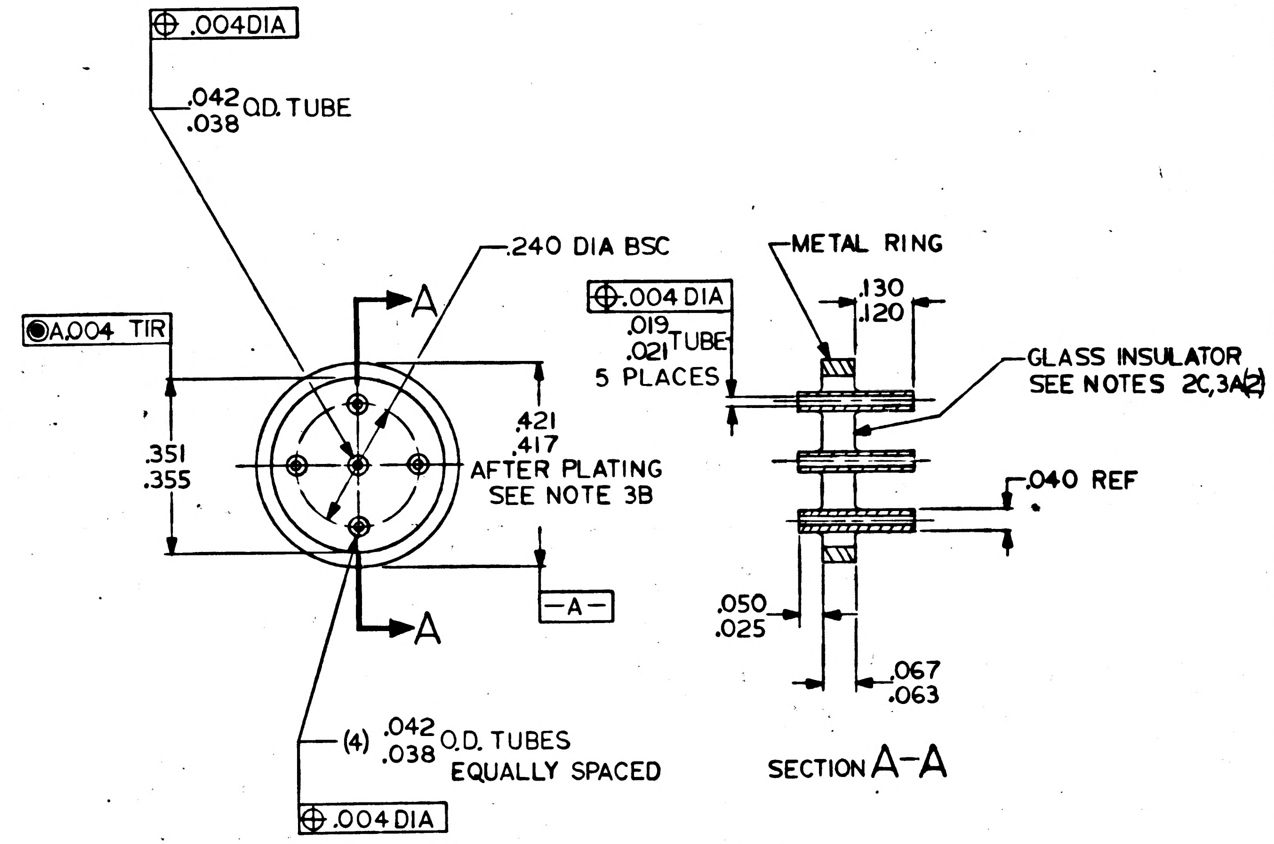
3. DESIGN:

A. MATERIAL:

(1) MOUNTING RING AND TUBES: METAL ALLOY SUITABLE FOR THE PURPOSE.

(2) INSULATOR: GLASS SUITABLE FOR THE PURPOSE.

B. FINISH: METAL SURFACES SHALL BE TIN PLATED PER MIL-T-10727, TYPE I (ELECTRODEPOSITED). THICKNESS OF TIN PLATE SHALL BE .0004 TO .0006 INCH.



QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. Getz 5/27/65
CHECKED Gberbor ASM 1 June 65
APPROVED
APPROVED Eldon C Hall 21 June 65
APPROVED MIT W Kupfer 22 June 65
APPROVED MSC 6/22/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HEADER, FEED THRU TERMINAL
HERMETICALLY SEALED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006354
SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 20105			6-15-65	

DASH NO.	DIM. A MAX.	DIM. B	NO. COND (SOLID)	INSULATION COLOR AND SEQUENCE/ARRANGEMENT
-001	.130	.042 ±.003	3	BLACK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3

C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, NET CONTENTS, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-C-12000.

(1) PACKAGING: LEVEL A; IF COILED, COILS SHALL BE 5 INCH MIN DIAMETER.

(2) PACKING: LEVEL B.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) CONSTRUCTION: WHEN VIEWED UNDER 10X MAGNIFICATION, INSULATION SHALL APPEAR AS A HOMOGENEOUS MASS WITHOUT EVIDENCE OF CRACKS, FLAWS, OR SEPARATION, COLORS OR ELSEWHERE.

(3) TEAR STRENGTH BETWEEN ANY LENGTHWISE CONDUCTOR AND ANY OTHER SHALL BE 1 LB. MIN. WHETHER THE WEBBING IS NOTCHED OR UNNOTCHED.

B. ELECTRICAL CHARACTERISTICS: TEST PER MIL-W-16878/4

(1) DIELECTRIC WITHSTANDING VOLTAGE: 2000 VRMS MIN FOR ONE MINUTE.

(2) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM/1000 FT OF INDIVIDUAL WIRE AT 500 VDC.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF MATERIAL SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

(2) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

3. DESIGN:

A. OPERATION AND/OR STORAGE LIFE: INDEFINITE WITHOUT EMBRITTLEMENT OF CONDUCTORS OR PLASTIC INSULATION AT TEMPERATURES FROM +200°C TO -55°C.

B. CONSTRUCTION: A MULTIPLICITY OF NO. 30 AWG SILVER PLATED SOFT ANNEALED SOLID COPPER PER QQ-C-343. CONDUCTORS ARRANGED IN A FLAT STRIP WHICH HAS A HOMOGENEOUS POLYTETRAFLUOROETHYLENE (TFE) INSULATION AROUND EACH CONDUCTOR AND AN INTER-CONNECTING WEB WHICH CAN BE SLIT TO SEPARATE THE INSULATED CONDUCTORS.

C. ELECTRICAL CHARACTERISTICS: TEST PER MIL-W-16878/4

(1) DIELECTRIC CONSTANT: 2.2 MAXIMUM

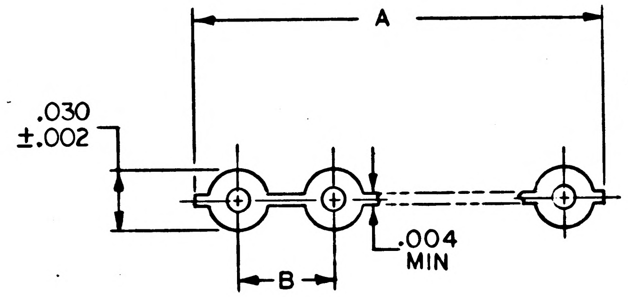
(2) POWER FACTOR: 0.005 (0.5%) MAXIMUM

(3) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM

D. WORKING VOLTAGE: 600 VOLTS RMS

4. LENGTH TO BE AS SPECIFIED ON PURCHASE ORDER.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	H. Wong	21MAY65
CHECKED	D. Laperle HBM	26MAY65
APPROVED		
APPROVED	Eldon C Hall	14June65
APPROVED MIT	M G Manley	6-15-65
APPROVED MSC		6/15/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, FLAT, TEFLON
SOLID COPPER CONDUCTOR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006357
SCALE NONE		SHEET 1 OF 1

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 22580			9-21-65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. PARTS DESCRIBED HEREIN SHALL CONFORM TO ALL THE APPLICABLE REQUIREMENTS OF MIL-C-26482 FOR BAYONET COUPLING, NUT MOUNTING, CLASS H SEAL, PIN CONTACT CONNECTORS WITH SHELL AND INSERT SIZES AS DELINEATED ON THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF MIL-C-26482.
   - E. PIECE MARKING: CONNECTORS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). OTHER MANUFACTURER'S INFORMATION MAY APPEAR ON THE PARTS.
   - F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS 1, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION:
   - A. DIMENSIONS: AS DELINEATED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INSULATION RESISTANCE: MIL-STD-202, METHOD 302, CONDITION B.

       AT 25°C: 5000 MEGOHMS MINIMUM AT 500 VDC
     - (2) DIELECTRIC WITHSTANDING VOLTAGE: MIL-STD-202, METHOD 301.

       375 VRMS AT 70,000 FT ALTITUDE. 1500 VRMS AT SEA LEVEL.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:
     - (1) CERTIFICATE OF COMPLIANCE WITH ALL DESIGN REQUIREMENTS.
     - (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.
     - (3) CERTIFICATE OF COMPLIANCE WITH HERMETIC SEAL REQUIREMENT.
   - D. PINS: SIZE NO. 22 (.029 ± .001) DIA.
   - E. TERMINALS SHALL BE IDENTIFIED ON BOTH SIDES OF BODY.
3. DESIGN:
   - A. OPERATING LIFE (DURABILITY): 500 CYCLES OF ENGAGEMENT MINIMUM. (USING PLUG 1010929)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) CONTACT CURRENT RATINGS: 3 AMPERES MAXIMUM.
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC.
     - (3) CONTACT RESISTANCE: 50 MILLIVOLTS AT 3 AMPERES. 150 MICROVOLTS AT 10 MILLIAMPS WHEN MATED WITH 1010929.
     - (4) INSULATION RESISTANCE (PER 2B1) 50 MEGOHMS MINIMUM AT 125°C.
   - C. MECHANICAL REQUIREMENTS:
     - (1) COUPLING MECHANISM: BAYONET LOCK.
     - (2) ENGAGING FORCE: 40 LBS. MAX.
       DISENGAGING FORCE: 3.75 MIN.
     - (3) MOUNTING: SHALL MOUNT TO A .125 MAXIMUM PANEL.
     - (4) CONTACT RETENTION: 75 LBS. MIN IN DIRECTION OF MATING FORCES.
     - (5) CONTACT SPACING: .080 CENTER TO CENTER.
     - (6) INSERT RETENTION: 100 PSI STATIC LOAD FOR 5 MINUTES.
   - D. MATERIAL & FINISH
     - (1) SHELL: MILD COLD ROLLED STEEL. GOLD PLATE PER MIL-G-45204, TYPE II .000100/.000200 NICKEL PLATE PER QQN-290
     - (2) INSERT: VITREOUS DIELECTRIC PER MIL-C-26482.
     - (3) CONTACTS: NICKEL IRON ALLOY (51% NICKEL, BALANCE IRON), GOLD PLATE PER MIL-G-45204 TYPE II, CLASS 2, OVER COPPER PLATE PER MIL-C-14550, CLASS 3.
     - (4) RESILIENT INSERT: FLUORINATED SILICON RUBBER.
   - E. AIR LEAKAGE: .1 MICRON CUBIC FOOT PER HOUR WHEN SUBJECTED TO A PRESSURE DIFFERENTIAL OF 15 + .3 PSI ACROSS THE CONNECTOR IN ACCORDANCE WITH MIL-C-26482.
   - F. ACCESSORY PARTS
     - (1) MATING PLUG: IN ACCORDANCE WITH SCD 1010929.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. Doty GB 17JUL65
CHECKED A. Kupfer 23JUL65
APPROVED
APPROVED Eldon C Hall 21Sept65
APPROVED MIT M G Mulley 9-21-65
APPROVED MSC Arthur C. Metzger
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE,
ELECTRICAL,
HERMETIC SEAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006361
SCALE NONE
SHEET 1 OF 2

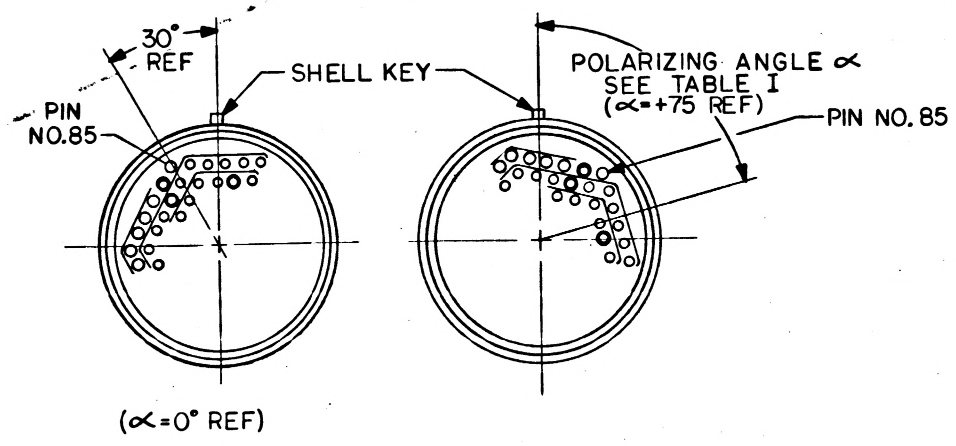
NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

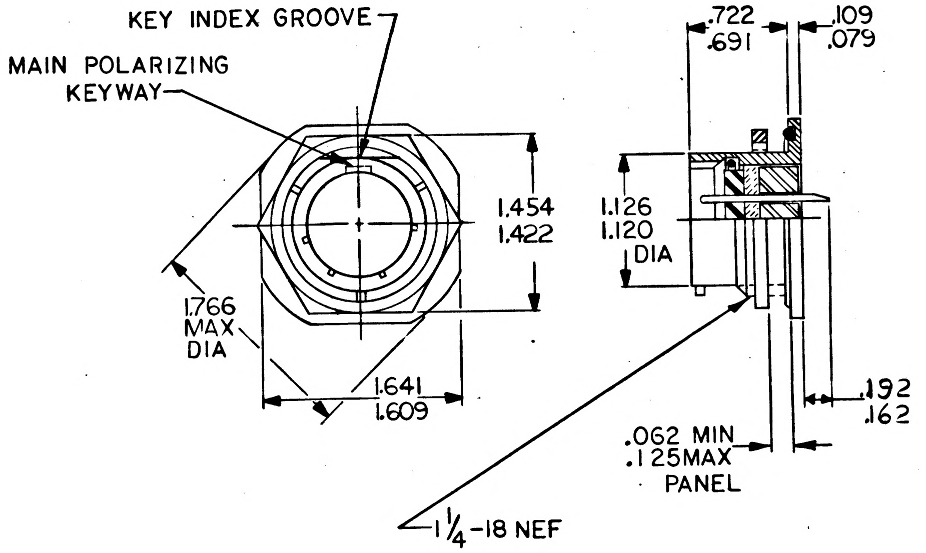
REVISIONS

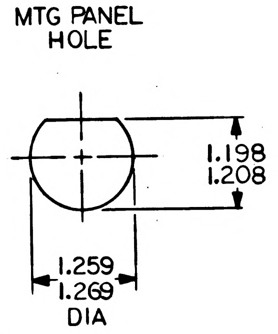
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A 22580 PER TDRR			9-21-65	

TABLE I

DASH NO. (PINS) +∝	INSERT POLARIZING ANGLE ∝	CONTACTS ACCOMODATED	SHELL SIZE
-001	0°	85	18
-002	225°		
-003	150°		
-004	75°		


30° REF
SHELL KEY
PIN NO.85
(∝=0° REF)
POLARIZING ANGLE ∝
SEE TABLE I
(∝=+75 REF)
PIN NO. 85


KEY INDEX GROOVE
MAIN POLARIZING KEYWAY
1.454
1.422
1.766 MAX DIA
1.641
1.609
.722
.691
.109
.079
1.126
1.120
DIA
.192
.162
.062 MIN
.125MAX
PANEL
1 1/4-18 NEF


MTG PANEL HOLE
1.198
1.208
1.259
1.269
DIA

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. Doty GB 17 JUL65
CHECKED A. Kupfer 23 JUL 65
APPROVED
APPROVED Eldon C Hall 21 Sept 65
APPROVED MIT MG Mueller 9-21-65
APPROVED MSC Arthur C. McTaggart
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL, HERMETIC SEAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006361
SCALE NONE
SHEET 2 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS							
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 22887			10-5-65		
A		REVISED PER TDRR 23170			10/16/65	WR	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 1.
   - C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, PRODUCT NAME, NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), NET CONTENTS, DATE OF MANUFACTURE, AND LOT OR SERIAL NUMBER.
   - D. PACKAGING AND PACKING: UNIT PACKAGING SHALL BE IN ACCORDANCE WITH THE SUPPLIER'S NORMAL COMMERCIAL PRACTICE. SHIPPING CONTAINERS SHALL BE OF THE TYPE, SIZE AND KIND COMMONLY USED FOR THE PURPOSE IN A MANNER THAT WILL INSURE ACCEPTANCE BY COMMON CARRIER AND SAFE DELIVERY AT DESTINATION. SHIPPING CONTAINERS SHALL COMPLY WITH THE UNIFORM FREIGHT CLASSIFICATION RULES OR REGULATIONS OF OTHER CARRIERS, AS APPLICABLE TO THE MODE OF TRANSPORTATION.

2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. INSULATION:
     - (1) MATERIAL: EPOXY GLASS LAMINATE PER MIL-P-18177, TYPE GEE.
     - (2) THICKNESS: .020 ± .002
   - B. CLADDING:
     - (1) MATERIAL: MULTILAYER FOIL CONSISTING OF A SURFACE LAYER OF NICKEL HAVING A MINIMUM PURITY OF 99% (Ni & Co.), AN INTERMEDIATE LAYER OF STEEL HAVING A COMPOSITION OF SAE 1006, AND A BONDING LAYER OF ALUMINUM HAVING A MINIMUM PURITY OF 99%.
     - (2) TOTAL FOIL THICKNESS: .0030 ± .0003
     - (3) NICKEL THICKNESS: .00015 TO .00030 LIMIT
     - (4) STEEL THICKNESS: .00245 TO .00280 LIMIT
     - (5) ALUMINUM THICKNESS: .00010 TO 00020 LIMIT
   - C. RESISTANCE: 11.5 X 10^{-4} OHMS WITH A SAMPLE MM ^{2} AND 3 MM THICK
   - D. FOIL FINISH
     - (1) SCRATCHES: .140 X 10^{-6} INCHES DEEP MAX.
     - (2) INCLUSIONS: NOT MORE THAN 2 OF .030 INCH DIA./FT^2 OF SURFACE AREA
     - (3) WRINKLES: NOT MORE THAN 4 PER SIDE GREATER THAN 1" LONG/FT^2 OF SURFACE AREA.
     - (4) PITS & DENTS: SHALL MEET THE REQUIREMENTS OF MIL-P-13949
   - E. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING INFORMATION WITH EACH SHIPMENT.
     - (1) CERTIFICATE OF COMPLIANCE WITH ND 1015404.
     - (2) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.
     - (3) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

3. DESIGN:
   - A. CONSTRUCTION:
     - (1) MULTILAYER FOIL CLADDING BONDED TO EPOXY GLASS LAMINATE ON BOTH SIDES WITH ALUMINUM THE BONDING LAYER, STEEL THE INTERMEDIATE LAYER, AND NICKEL THE SURFACE LAYER. NO ORGANIC BONDING AGENT SHALL BE USED.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) RELATIVE FOIL CONDUCTIVITY: 17% MIN, INTERNATIONAL ANNEALED COPPER STANDARD.
   - C. MECHANICAL REQUIREMENTS:
     - (1) PEEL STRENGTH: 12 LB. PER INCH OF WIDTH MINIMUM WHEN TESTED PER MIL-P-13949 BETWEEN EPOXY LAMINATE AND ALUMINUM FOIL INTERFACE AT 90°.

NOTE: ONLY THESE ITEMS LISTED AND IDENTIFIED BY VENDOR'S NAME, ADDRESS, AND PRODUCT DESIGNATION HAVE BEEN TESTED AND APPROVED BY MIT INSTRUMENTATION LAB. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR TESTING AND APPROVAL BY MIT/IL.

VENDOR: METALS & CONTROLS INC.
ATTLEBORO, MASS.

MFG. PART NO. - 1226-2

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN W. Wong 31AUG65
CHECKED J. Yon 2SEP65
APPROVED
APPROVED Ellen C Hall 5Oct65
APPROVED MIT W Kupfer 5Oct65
APPROVED NASA NOT REQUIRED PER LETTER PP7-65-612
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLASTIC SHEET, LAMINATED,
METAL CLAD
SOURCE CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006362
SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 22887			10-5-65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 1.
   - C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, PRODUCT NAME, NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), NET CONTENTS, DATE OF MANUFACTURE, AND LOT OR SERIAL NUMBER.
   - D. PACKAGING AND PACKING: UNIT PACKAGING SHALL BE IN ACCORDANCE WITH THE SUPPLIER'S NORMAL COMMERCIAL PRACTICE. SHIPPING CONTAINERS SHALL BE OF THE TYPE, SIZE AND KIND COMMONLY USED FOR THE PURPOSE IN A MANNER THAT WILL INSURE ACCEPTANCE BY COMMON CARRIER AND SAFE DELIVERY AT DESTINATION. SHIPPING CONTAINERS SHALL COMPLY WITH THE UNIFORM FREIGHT CLASSIFICATION RULES OR REGULATIONS OF OTHER CARRIERS, AS APPLICABLE TO THE MODE OF TRANSPORTATION.

2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. INSULATION:
     - (1) MATERIAL: EPOXY GLASS LAMINATE PER MIL-P-18177, TYPE GEE.
     - (2) THICKNESS: .020 ± .002
   - B. CLADDING:
     - (1) MATERIAL: MULTILAYER FOIL CONSISTING OF A SURFACE LAYER OF NICKEL HAVING A MINIMUM PURITY OF 99% (Ni & Co.), AN INTERMEDIATE LAYER OF STEEL HAVING A COMPOSITION OF SAE 1006, AND A BONDING LAYER OF ALUMINUM HAVING A MINIMUM PURITY OF 99%.
     - (2) TOTAL FOIL THICKNESS: .0030 ± .0003
     - (3) NICKEL THICKNESS: .00015 ± 10% OF TOTAL FOIL THICKNESS
     - (4) STEEL THICKNESS: .0027 ± 10% OF TOTAL FOIL THICKNESS
     - (5) ALUMINUM THICKNESS: .00015 ± 10% OF TOTAL FOIL THICKNESS
   - C. RESISTANCE: 11.5 X 10^{-4} OHMS WITH A SAMPLE MM ^{2} AND 3 MM THICK
   - D. FOIL FINISH
     - (1) SCRATCHES: .140 X 10^{-6} INCHES DEEP MAX.
     - (2) INCLUSIONS: NOT MORE THAN 2 OF .030 INCH DIA./FT^2 OF SURFACE AREA
     - (3) WRINKLES: NOT MORE THAN 1 PER SIDE GREATER THAN 1" LONG/FT^2 OF SURFACE AREA.
     - (4) PITS & DENTS: SHALL MEET THE REQUIREMENTS OF MIL-C-13949
   - E. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING INFORMATION WITH EACH SHIPMENT.
     - (1) CERTIFICATE OF COMPLIANCE WITH ND 1015404.
     - (2) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.
     - (3) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

3. DESIGN:
   - A. CONSTRUCTION:
     - (1) MULTILAYER FOIL CLADDING BONDED TO EPOXY GLASS LAMINATE ON BOTH SIDES WITH ALUMINUM THE BONDING LAYER, STEEL THE INTERMEDIATE LAYER, AND NICKEL THE SURFACE LAYER. NO ORGANIC BONDING AGENT SHALL BE USED.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) RELATIVE FOIL CONDUCTIVITY: 17% MIN, INTERNATIONAL ANNEALED COPPER STANDARD.
   - C. MECHANICAL REQUIREMENTS:
     - (1) PEEL STRENGTH: 12 LB. PER INCH OF WIDTH MINIMUM WHEN TESTED PER MIL-P-13949, BETWEEN EPOXY LAMINATE AND ALUMINUM FOIL INTERFACE AT 90°.

NOTE: ONLY THESE ITEMS LISTED AND IDENTIFIED BY VENDOR'S NAME, ADDRESS, AND PRODUCT DESIGNATION HAVE BEEN TESTED AND APPROVED BY MIT INSTRUMENTATION LAB. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR TESTING AND APPROVAL BY MIT/IL.

VENDOR: METALS & CONTROLS INC.
ATTLEBORO, MASS.

MFG. PART NO. - 1226-2

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	W. Wong	31AUG65
CHECKED	J. Yon	2SEP65
APPROVED		
APPROVED	Ellen C Hall	5Oct65
APPROVED MIT	W Ziegler	5Oct65
APPROVED NASA	NOT REQUIRED PER LETTER NASA PP7-65-612	DATE

PLASTIC SHEET, LAMINATED, METAL CLAD
SOURCE CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006362
SCALE NONE		SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 22754			8-28-65	
A		REVISED PER TDRR 25022			1/11/66	Wll

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, PRODUCT NAME, NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), NET CONTENTS, DATE OF MANUFACTURE, EXPIRATION DATE, AND LOT OR SERIAL NUMBER.

D. PACKAGING AND PACKING: UNIT PACKAGING SHALL BE IN ACCORDANCE WITH THE SUPPLIER'S NORMAL COMMERCIAL PRACTICE. SHIPPING CONTAINERS SHALL BE OF THE TYPE, SIZE AND KIND COMMONLY USED FOR THE PURPOSE IN A MANNER THAT WILL INSURE ACCEPTANCE BY COMMON CARRIER AND SAFE DELIVERY AT DESTINATION. SHIPPING CONTAINERS SHALL COMPLY WITH THE UNIFORM FREIGHT CLASSIFICATION RULES OR REGULATIONS OF OTHER CARRIERS, AS APPLICABLE TO THE MODE OF TRANSPORTATION.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES:

(1) VISCOSITY AT 25°C: 500 TO 600 CPS USING LVF BROOKFIELD VISCOMETER AT 30 RPM WITH NO.2 SPINDLE.

(2) SPECIFIC GRAVITY: 1.16 TO 1.20

(3) COLOR: CLEAR

B. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING INFORMATION WITH EACH SHIPMENT.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404.

(2) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

A. PROPERTIES: WHEN PROPERLY CURED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, USING CURING AGENTS AND PROPORTIONS SPECIFIED IN TABLE I, THE RESULTING PRODUCT SHALL HAVE THE FOLLOWING TYPICAL PROPERTIES:

(1) DENSITY (LBS/CU. IN.): 0.04

(2) COMPRESSIVE STRENGTH (PSI) PER ASTM D695-54: 15,900

(3) HARDNESS (ROCKWELL):

FOR CASTING: M100

FOR ENCAPSULATING: M50*

(4) TENSILE STRENGTH (PSI) PER ASTM D638-58T: 8,900

(5) FLEXURAL STRENGTH (PSI) PER ASTM D790-58T: 20,600

(6) OPERATING TEMPERATURE: 250°F

(7) HEAT DISTORTION POINT (264 PSI) PER ASTM D648-56: 190°F

(8) INDEX OF REFRACTION : 1.55

(9) IMPACT STRENGTH (FT.-LBS/IN. NOTCHED) PER ASTM D256-56, METHOD A: PER TABLE 1.

(10) DIELECTRIC CONSTANT, 1000 CPS PER ASTM D150-54T: 4

(11) DISSIPATION FACTOR, 1000 CPS PER ASTM D150-54T: 0.02

(12) DIELECTRIC STRENGTH (ST, 1/8 THICK) VOLTS/MIL PER ASTM D149-55T: 450

* REPRESENTS AVERAGE VALUE. HARDNESS CAN BE INCREASED BY POST-CURING.

B. STORAGE LIFE: THIS MATERIAL SHALL HAVE A STORAGE LIFE OF NOT LESS THAN 6 MONTHS, WHEN STORED IN CLOSED CONTAINERS AT TEMPERATURES LOWER THAN 77°F.

TABLE I

INTENDED USE	RESIN	PARTS BY WEIGHT RESIN/CURING AGENT	CURING AGENT	IMPACT STRENGTH
CASTING	1006366	100/7	1006367	.42 - .45
ENCAPSULATING	1006366	100/20	1006365	.80 - .90

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong	AG	27AUG65
CHECKED	J. Yen	WLM	2SEP65
APPROVED			
APPROVED	Eldon C. Hall		24Sept65
APPROVED MIT	W. Kupfer		28Sept65
APPROVED MSC	NOT REQUIRED PER LETTER NASA PP7-65-612		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

EPOXY RESIN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006366

SCALE NONE | SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 22754			9-28-65	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, PRODUCT NAME, NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), NET CONTENTS, DATE OF MANUFACTURE, EXPIRATION DATE, AND LOT OR SERIAL NUMBER.

D. PACKAGING AND PACKING: UNIT PACKAGING SHALL BE IN ACCORDANCE WITH THE SUPPLIER'S NORMAL COMMERCIAL PRACTICE. SHIPPING CONTAINERS SHALL BE OF THE TYPE, SIZE AND KIND COMMONLY USED FOR THE PURPOSE IN A MANNER THAT WILL INSURE ACCEPTANCE BY COMMON CARRIER AND SAFE DELIVERY AT DESTINATION. SHIPPING CONTAINERS SHALL COMPLY WITH THE UNIFORM FREIGHT CLASSIFICATION RULES OR REGULATIONS OF OTHER CARRIERS, AS APPLICABLE TO THE MODE OF TRANSPORTATION.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES:

(1) VISCOSITY AT 25°C: 2,000 CPS USING LVT BROOKFIELD VISCOMETER AT 20 RPM WITH NO. 3 SPINDLE.

(2) SPECIFIC GRAVITY: 1.16 TO 1.20

(3) COLOR: CLEAR

B. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING INFORMATION WITH EACH SHIPMENT.

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404.

(2) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

A. PROPERTIES: WHEN PROPERLY CURED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, USING CURING AGENTS AND PROPORTIONS SPECIFIED IN TABLE I, THE RESULTING PRODUCT SHALL HAVE THE FOLLOWING TYPICAL PROPERTIES:

(1) DENSITY (LBS/CU. IN.): 0.04

(2) COMPRESSIVE STRENGTH (PSI) PER ASTM D695-54: 15,900

(3) HARDNESS (ROCKWELL):

FOR CASTING: M100

FOR ENCAPSULATING: M50*

MASTER

(4) TENSILE STRENGTH (PSI) PER ASTM D638-58T: 8,900

(5) FLEXURAL STRENGTH (PSI) PER ASTM D790-58T: 20,600

(6) OPERATING TEMPERATURE: 250°F

(7) HEAT DISTORTION POINT (264 PSI) PER ASTM D648-56: 190°F

(8) INDEX OF REFRACTION): 1.55

(9) IMPACT STRENGTH (FT.-LBS/IN. NOTCHED) PER ASTM D256-56, METHOD A: 0.90

(10) DIELECTRIC CONSTANT, 1000 CPS PER ASTM D150-54T: 4

(11) DISSIPATION FACTOR, 1000 CPS PER ASTM D150-54T: 0.02

(12) DIELECTRIC STRENGTH (ST, 1/8 THICK) VOLTS/MIL PER ASTM D149-55T: 450

* REPRESENTS AVERAGE VALUE. HARDNESS CAN BE INCREASED BY POST-CURING.

B. STORAGE LIFE: THIS MATERIAL SHALL HAVE A STORAGE LIFE OF NOT LESS THAN 6 MONTHS, WHEN STORED IN CLOSED CONTAINERS AT TEMPERATURES LOWER THAN 77°F.

TABLE I

INTENDED USE	RESIN	PARTS BY WEIGHT RESIN/CURING AGENT	CURING AGENT
CASTING	1006366	100/7	1006367
ENCAPSULATING	1006366	100/20	1006365

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong AG	27AUG65
CHECKED	J. Y WLM	2SEP65
APPROVED		
APPROVED	Eldon C. Hall	24Sept65
APPROVED MIT	W. Kupfer	28Sept65
APPROVED MSC	NOT REQUIRED PER LETTER NASA PP7 65-612	DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

EPOXY RESIN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006366

SCALE NONE

SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006370 A

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 21448			8-10-65	
A		REVISED PER TDRR 26857			3/8/66	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.

C. MARKING: EACH SHEET OF MATERIAL SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 8.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. MECHANICAL PROPERTIES (AT 25°C UNLESS OTHERWISE SPECIFIED):

(1) DIMENSIONS: AS SPECIFIED IN TABLE I (THICKNESS) AND THE PROCUREMENT DOCUMENT (LENGTH AND WIDTH).

(2) MARKING: AS SPECIFIED IN NOTES 1.C. AND 1.D.

(3) COLOR: FROM OFF-WHITE TO LIGHT TAN.

(4) DESCRIPTION: FLEXIBLE, FOAMED, OPEN-CELL SILICONE RUBBER SHEET FREE OF SEAMS, LARGE VOIDS, SKIN, OR RIND.

(5) DENSITY: AS SPECIFIED IN TABLE I.

(6) COMPRESSION DEFLECTION LOAD: AS SPECIFIED IN TABLE I WHEN TESTED PER ASTM D1056-59T, MODIFIED AS FOLLOWS:

(a) TEST SPECIMEN: PLATEN WITH A 1.129 INCH DIAMETER DIE. 0.150 INCH THICK MINIMUM WHEN MEASURED BY AN OPTICAL COMPARATOR OR OTHER SUITABLE MEANS.

(b) CONDITIONING: SPECIMEN SHALL BE COMPRESSION CYCLED 3 TIMES TO A 60% DEFLECTION (BASED ON ORIGINAL THICKNESS) AT A 0.050 INCH/MINUTE COMPRESSION RATE. THE LOAD READING SHALL BE TAKEN ON THE THIRD CYCLE.

(7) COMPRESSION SET (HIGH TEMPERATURE): 20% MAXIMUM AFTER 22 HOURS AT 300°F AND A 40% DEFLECTION WHEN MEASURED PER ASTM D-395, METHOD B.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -85°F TO +250°F

B. COMPRESSION SET (LOW TEMPERATURE): 12% MAXIMUM AFTER 22 HOURS AT -65°F AND A 40% DEFLECTION WHEN MEASURED PER ASTM D1229.

TABLE I

DASH NO.	NOM SHEET THICKNESS (FREE HGT.)	FREE HGT. FLATNESS	COMPRESSION DEFLECTION LOAD (PSI)	COMPRESSION DEFLECTION HEIGHT	DENSITY (GM/CC)
001	0.120	.005	1.3 ± 0.3	0.100	0.28-0.30
002	0.440	.010	1.3 ± 0.2	0.350	0.28-0.30
003	0.525	.010	0.8 ± 0.2	0.480	0.28-0.30
004	0.193	.005	1.5 ± 0.2	0.148	0.28-0.30
005	0.127	.005	1.5 ± 0.2	0.100	0.28-0.30
006	0.091	.005	1.5 ± 0.2	0.068	0.28-0.30
007	0.335	.005	1.5 ± 0.2	0.260	0.28-0.30

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. Doty 4 AUG 65
CHECKED 5 AUG 65
APPROVED 8-10-65
APPROVED
APPROVED MIT W Kupfer 10 Aug 65
APPROVED MSC 8/11/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CELLULAR RUBBER
SHEET, SILICONE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006370
SCALE NONE
SHEET 1 OF 1

1006370 A

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006370

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A 21448 PER TORR			8-10-65	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.

C. MARKING: EACH SHEET OF MATERIAL SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 8.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. MECHANICAL PROPERTIES (AT 25°C UNLESS OTHERWISE SPECIFIED):

(1) DIMENSIONS: AS SPECIFIED IN TABLE I (THICKNESS) AND THE PROCUREMENT DOCUMENT (LENGTH AND WIDTH).

(2) MARKING: AS SPECIFIED IN NOTES 1.C. AND 1.D.

(3) COLOR: FROM OFF-WHITE TO LIGHT TAN.

(4) DESCRIPTION: FLEXIBLE, FOAMED, OPEN-CELL SILICONE RUBBER SHEET FREE OF SEAMS, LARGE VOIDS, SKIN, OR RIND.

(5) DENSITY: AS SPECIFIED IN TABLE I.

(6) COMPRESSION DEFLECTION LOAD: AS SPECIFIED IN TABLE I WHEN TESTED PER ASTM D1056-59T, MODIFIED AS FOLLOWS:

(a) TEST SPECIMEN: PLATEN WITH A 1.129 INCH DIAMETER DIE. 0.150 INCH THICK MINIMUM WHEN MEASURED BY AN OPTICAL COMPARATOR OR OTHER SUITABLE MEANS.

(b) CONDITIONING: SPECIMEN SHALL BE COMPRESSION CYCLED 3 TIMES TO A 60% DEFLECTION (BASED ON ORIGINAL THICKNESS) AT A 0.050 INCH/MINUTE COMPRESSION RATE. THE LOAD READING SHALL BE TAKEN ON THE THIRD CYCLE.

(7) COMPRESSION SET (HIGH TEMPERATURE): 20% MAXIMUM AFTER 22 HOURS AT 300°F AND A 40% DEFLECTION WHEN MEASURED PER ASTM D-395, METHOD B.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -85°F TO +250°F

B. COMPRESSION SET (LOW TEMPERATURE): 12% MAXIMUM AFTER 22 HOURS AT -65°F AND A 40% DEFLECTION WHEN MEASURED PER ASTM D1229.

TABLE I

DASH NO.	NOM SHEET THICKNESS (FREE HGT.)	FREE HGT. FLATNESS	COMPRESSION DEFLECTION		DENSITY (GM/CC)
			LOAD (PSI)	HEIGHT	
001	0.120	.005	1.3 ± 0.3	0.100	0.28-0.30
002	0.440	.010	1.3 ± 0.2	0.350	0.28-0.30
003	0.525	.010	0.8 ± 0.2	0.480	0.28-0.30

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	J. Doty	4AUG65
CHECKED		5AUG65
APPROVED		8-10-65
APPROVED		
APPROVED MIT		10Aug65
APPROVED MSC		8/11/65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CELLULAR RUBBER
SHEET, SILICONE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006370

SCALE NONE
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 22757			9-28-65	WR
A		REVISED PER TDRR 25528			3/15/66	WR

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.

   C. UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, QUANTITY, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      (1) DIMENSIONS: AS SHOWN.

   B. ELECTRICAL REQUIREMENTS:

      (1) CONTINUITY: EACH CONDUCTOR SHALL BE ELECTRICALLY CONTINUOUS BETWEEN ITS TERMINATIONS.

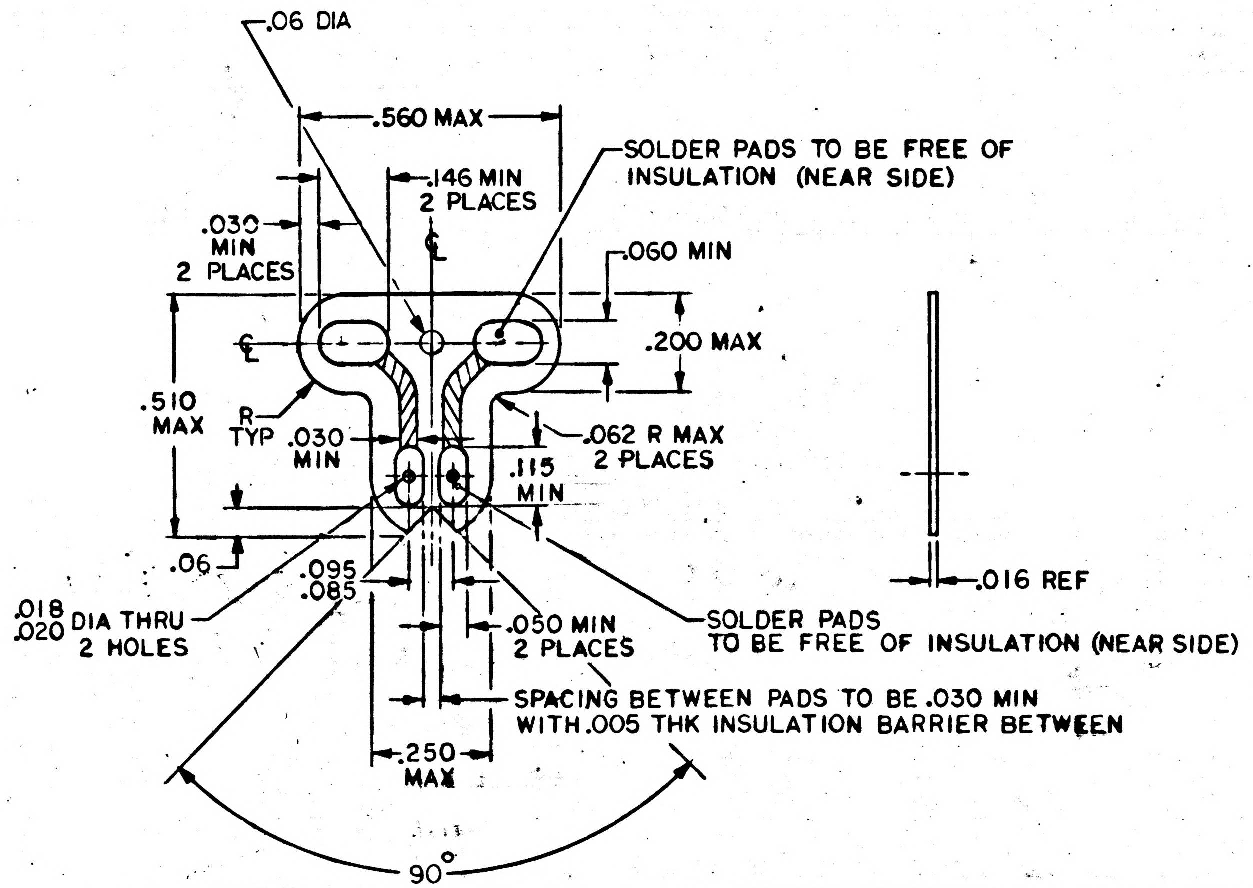
      (2) DIELECTRIC WITHSTANDING VOLTAGE: 500 VDC (TEST PER MIL-STD-202, METHOD 301), AT 500 VDC.

      (3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM (TEST PER MIL-STD-202, METHOD 302).

   C. EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:

      (1) CERTIFICATE OF COMPLIANCE WITH ND 1015404.

      (2) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS OF THIS DRAWING.


.06 DIA
.560 MAX
.146 MIN 2 PLACES
.030 MIN 2 PLACES
℄
SOLDER PADS TO BE FREE OF INSULATION (NEAR SIDE)
.060 MIN
.200 MAX
.510 MAX
R TYP
.030 MIN
.062 R MAX 2 PLACES
.115 MIN
.06
.095 .085
.018 .020 DIA THRU 2 HOLES
.050 MIN 2 PLACES
SOLDER PADS TO BE FREE OF INSULATION (NEAR SIDE)
SPACING BETWEEN PADS TO BE .030 MIN WITH .005 THK INSULATION BARRIER BETWEEN
.250 MAX
90°
.016 REF

3. DESIGN:

   A. CONSTRUCTION: THE UNIT SHALL CONSIST OF COPPER FOIL CONDUCTORS, LAMINATED BETWEEN SHEETS OF PLASTIC INSULATING MATERIAL, BACKED BY A SHEET OF GLASS CLOTH, AND HAVING SOLDERABLE CONDUCTOR TERMINATIONS.

   B. MATERIALS:

      (1) CONDUCTOR: TWO OUNCE (0.0027 THK) COPPER FOIL.

      (2) INSULATION: PLASTIC FILM, 0.005 THICK, TRIFLUOROCHLOROETHYLENE (KEL-F) OR FLUOROHALOCARBON (ACLAR)

      (3) BACKUP SHEET: .001 THICK GLASS CLOTH. AND .002 ACLAR OF KEL-F TO LAMINATE

   C. VOLTAGE RATING: 300 VRMS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
±	±.01	±2°

DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong GB	7SEP65
CHECKED	J P Fagan ABM	14SEP65
APPROVED		
APPROVED	Eldon C Hall	28Sep65
APPROVED MIT		28Sep65
APPROVED MSC	NOT REQUIRED PER LETTER NASA PP7-65-612	DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006371
SCALE NONE		SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 22757			9-28-65	WK
A		REVISED PER TDRR 25528			3/15/66	WK
B		REVISED PER TDRR 26880	LSB		3/15/66	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.

   C. UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, QUANTITY, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      (1) DIMENSIONS: AS SHOWN.

   B. ELECTRICAL REQUIREMENTS:

      (1) CONTINUITY: EACH CONDUCTOR SHALL BE ELECTRICALLY CONTINUOUS BETWEEN ITS TERMINATIONS.

      (2) DIELECTRIC WITHSTANDING VOLTAGE: 500 VDC (TEST PER MIL-STD-202, METHOD 301), AT 500 VDC.

      (3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM (TEST PER MIL-STD-202, METHOD 302).

   C. EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:

      (1) CERTIFICATE OF COMPLIANCE WITH ND 1015404.

      (2) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS OF THIS DRAWING.

3. DESIGN:

   A. CONSTRUCTION: THE UNIT SHALL CONSIST OF COPPER FOIL CONDUCTORS, LAMINATED BETWEEN SHEETS OF PLASTIC INSULATING MATERIAL, BACKED BY A SHEET OF GLASS CLOTH, AND HAVING SOLDERABLE CONDUCTOR TERMINATIONS.

   B. MATERIALS:

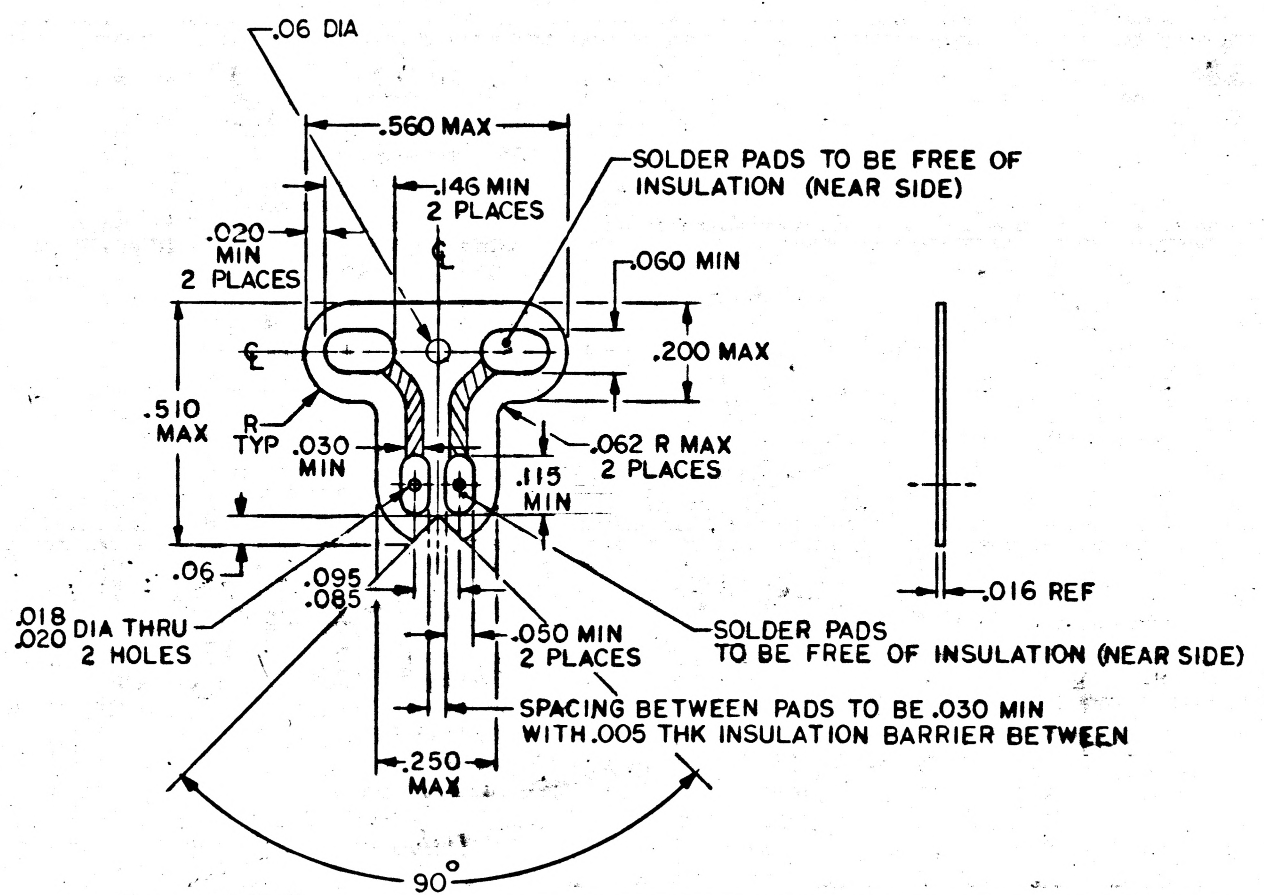
      (1) CONDUCTOR: TWO OUNCE (0.0027 THK) COPPER FOIL.

      (2) INSULATION: PLASTIC FILM, 0.005 THICK, TRIFLUOROCHLOROETHYLENE (KEL-F) OR FLUOROHALOCARBON (ACLAR)

      (3) BACKUP SHEET: .001 THICK GLASS CLOTH. AND .002 ACLAR OR KEL-F TO LAMINATE

   C. VOLTAGE RATING: 300 VRMS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
±	±.01	±2°

DO NOT SCALE THIS DRAWING

MATERIAL

SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	H. Wong GB	7SEP65
CHECKED	J.P. Fagan ABM	14SEP65
APPROVED		
APPROVED	Eldon C Hall	28Sep65
APPROVED MIT	NOT REQUIRED PER LETTER NASA PP7-65-612	28Sep65
APPROVED MSC		DATE

CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006371

SCALE NONE
SHEET 1 OF 1

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 22757			9-28-65	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.

C. UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, QUANTITY, LOT CODE OR NUMBER, DATE OF MANUFACTURE OR CODE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS SHOWN.

B. ELECTRICAL REQUIREMENTS:

(1) CONTINUITY: EACH CONDUCTOR SHALL BE ELECTRICALLY CONTINUOUS BETWEEN ITS TERMINATIONS.

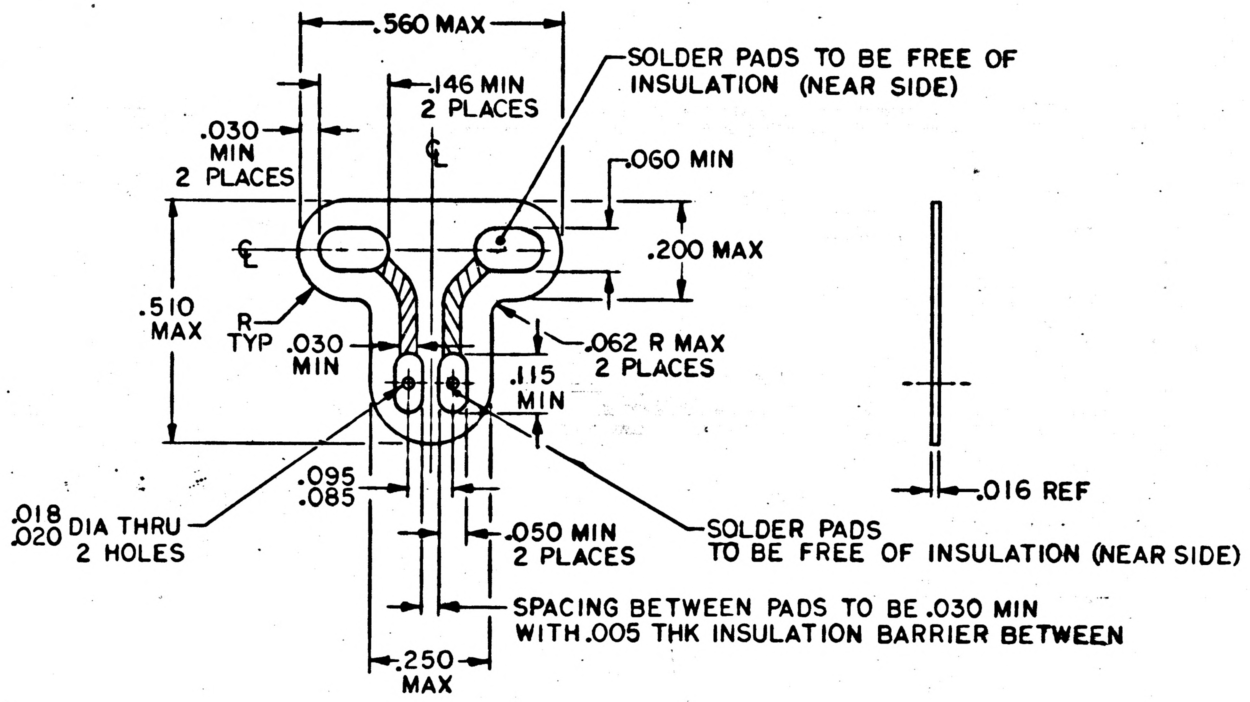
(2) DIELECTRIC WITHSTANDING VOLTAGE: 500 VDC (TEST PER MIL-STD-202, METHOD 301), AT 500 VDC.

(3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM (TEST PER MIL-STD-202, METHOD 302).

C. EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DATA:

(1) CERTIFICATE OF COMPLIANCE WITH ND 1015404.

(2) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS OF THIS DRAWING.



3. DESIGN:

A. CONSTRUCTION: THE UNIT SHALL CONSIST OF COPPER FOIL CONDUCTORS, LAMINATED BETWEEN SHEETS OF PLASTIC INSULATING MATERIAL, BACKED BY A SHEET OF GLASS CLOTH, AND HAVING SOLDERABLE CONDUCTOR TERMINATIONS.

B. MATERIALS:

(1) CONDUCTOR: TWO OUNCE (0.0027 THK) COPPER FOIL.

(2) INSULATION: PLASTIC FILM, 0.005 THICK, TRIFLUOROCHLOROETHYLENE (KEL-F) OR FLUOROHALOCARBON (ACLAR)

(3) BACKUP SHEET: .001 THICK GLASS CLOTH. AND .002 ACLAR OR KEL-F TO LAMINATE

C. VOLTAGE RATING: 300 VRMS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. Wong GB 7SEP65
CHECKED L.P. Fagan ABM 14SEP65
APPROVED
APPROVED Eldon C Hall 28Sep65
APPROVED MIT 28Sep65
~~NOT REQUIRED PER LETTER~~
~~NASA~~ PP7-65-612
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006371
SCALE NONE
SHEET 1 OF 1

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 27407			3-22-66	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-C-12000. WIRE SHALL BE COILED AND FURNISHED IN A BARREL PACK. THE BARREL DIAMETER SHALL BE 20 INCHES AND THE MINIMUM DIAMETER OF THE COIL SHALL BE 13 INCHES.

(1) CONTAINER (BARREL) SHALL BE MARKED IN ACCORDANCE WITH MIL-C-12000 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER, QUANTITY ENCLOSED AND THE PRECAUTIONARY WORDS "FRAGILE", "THIS END UP" AND "DO NOT DROP OR ROLL".

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) INSULATION: COLOR PER TABLE 1.

(2) DIAMETER OF CONDUCTOR: 0.010 INCH + 0.0003, -0.0001 INCH.

(3) DIAMETER OVER INSULATION: 0.021 INCH, ± 0.0015 INCH.

(4) MINIMUM CONTINUOUS LENGTH: 500 FEET.

(5) FLAMMABILITY: INSULATION SHALL NOT SUPPORT COMBUSTION.

(6) STRIP FORCE: THE INSULATION PULL-OFF FORCE FOR A 3 INCH STRIP SHALL BE 8 OUNCES MINIMUM, 3 POUNDS MAXIMUM.

B. ELECTRICAL CHARACTERISTICS: AT 25°C ± 5°C.

(1) DC RESISTANCE: 115 OHMS MAXIMUM PER 1000 FEET.

(2) VOLTAGE RATING: 600 VOLTS PEAK.

(3) DIELECTRIC STRENGTH: 1500 VOLTS RMS, MINIMUM AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

(4) INSULATION RESISTANCE: 2500 MEGOHMS MINIMUM PER 1000 FEET AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF WIRE SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

A. OPERATING TEMPERATURE: 130°C MAXIMUM.

B. TENSILE STRENGTH: 33,000 POUNDS PER SQUARE INCH MINIMUM, 42,000 PSI MAXIMUM.

C. ELONGATION: 12 PERCENT MINIMUM, 25 PERCENT MAXIMUM.

D. SPLICES: SPLICES OF THE CONDUCTOR SHALL BE ELECTRO-WELDED BEFORE FINAL PACKAGING AND SHALL BE OF THE BUTT TYPE. 2" ON EITHER SIDE OF SPLICE SHALL BE STRIPPED OF INSULATION.

E. DIELECTRIC CONSTANT: 3.3 MAXIMUM AT 1 MC AND 77°F

F. CONCENTRICITY: AT ANY CROSS SECTION ALONG THE LENGTH OF THE COMPLETED WIRE THE MINIMUM THICKNESS OF THE INSULATION SHALL NOT BE LESS THAN 41 PERCENT OF THE DIFFERENCE BETWEEN THE MEASURED DIAMETER OVER THE INSULATION AND THE MEASURED DIAMETER OVER THE CONDUCTOR, OR NOT LESS THAN 70 PERCENT OF THE MAXIMUM THICKNESS AT THAT CROSS-SECTION.

G. HEAT RESISTANCE: INSULATION SHALL WITHSTAND 1500 VOLTS MINIMUM AFTER 96 HOURS AT 150°C.

H. COLD BEND: INSULATION SHALL WITHSTAND 1500 VOLTS MINIMUM AFTER 4 HOURS AT -65°C AND BENT AROUND A 1/2 INCH DIAMETER MANDREL.

J. INSULATION CUT-THROUGH: AT A TEMPERATURE OF 50°C THE INSULATION SHALL RESIST THE PENETRATION OF A METAL BLADE 0.003 INCH ± 0.0002 INCH THICK WITH 750 GRAMS APPLIED AT THE POINT OF CONTACT FOR 24 HOURS. THERE SHALL BE NO ELECTRICAL CONTINUITY BETWEEN THE BLADE AND THE CONDUCTOR WHEN A POTENTIAL OF 500 VOLTS RMS IS APPLIED.

K. MINIMUM CURL OF WIRE: WHEN A 30 INCH LENGTH OF WIRE IS CUT FROM A BARREL, THE WIRE, WHEN LYING UNRESTRAINED ON A SMOOTH, FLAT SURFACE, SHALL NOT CURL UP TO A DIAMETER OF LESS THAN 10 INCHES WITHIN ONE MINUTE AT AMBIENT TEMPERATURES.

L. SPARK TEST: 2000 VOLTS RMS.

M. MATERIAL OF CONDUCTOR: SOLID, OXYGEN FREE HIGH CONDUCTIVITY, COPPER, CERTIFIED GRADE, REF ASTM-B-170 SILVER PLATED 40 MICROINCHES MINIMUM, 80 MICROINCHES MAXIMUM.

N. WORKMANSHIP: THE SURFACE OF THE FINISHED WIRE SHALL BE CLEAN, SMOOTH, FREE FROM FOREIGN RESIDUE AND FREE FROM VISIBLE BLEMISHES. THERE SHALL BE NO IMPERFECTIONS WHICH INCREASE THE OVERALL DIAMETER SO AS TO EXCEED THE MAXIMUM SPECIFIED. THE INSULATION SHALL BE UNIFORM THROUGHOUT AND FREE FROM ANY DEFECTS SUCH AS INCLUSIONS, RADIAL CRACKS, PINHOLES, DISCOLORATION OF CONDUCTOR OR INSULATION WHICH MAY AFFECT ITS SERVICEABILITY OR REQUIRE SPECIAL HANDLING.

P. MATERIAL IS A POLYSULFONE

R. INTENDED USE: MATERIAL WILL BE USED AS A WIRE-WRAP WIRE IN POTTED ASSEMBLIES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE I

DASH NO.	COLOR
-001	WHITE
-002	RED
-003	BLUE
-004	YELLOW

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong DMS	21 Sep 65
CHECKED	wam	22 Sep 65
APPROVED		21 Mar 66
APPROVED	Eldon C Hall	22 Mar 66
APPROVED MIT	W. C. METZGER	22 Mar 66
APPROVED MSC		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

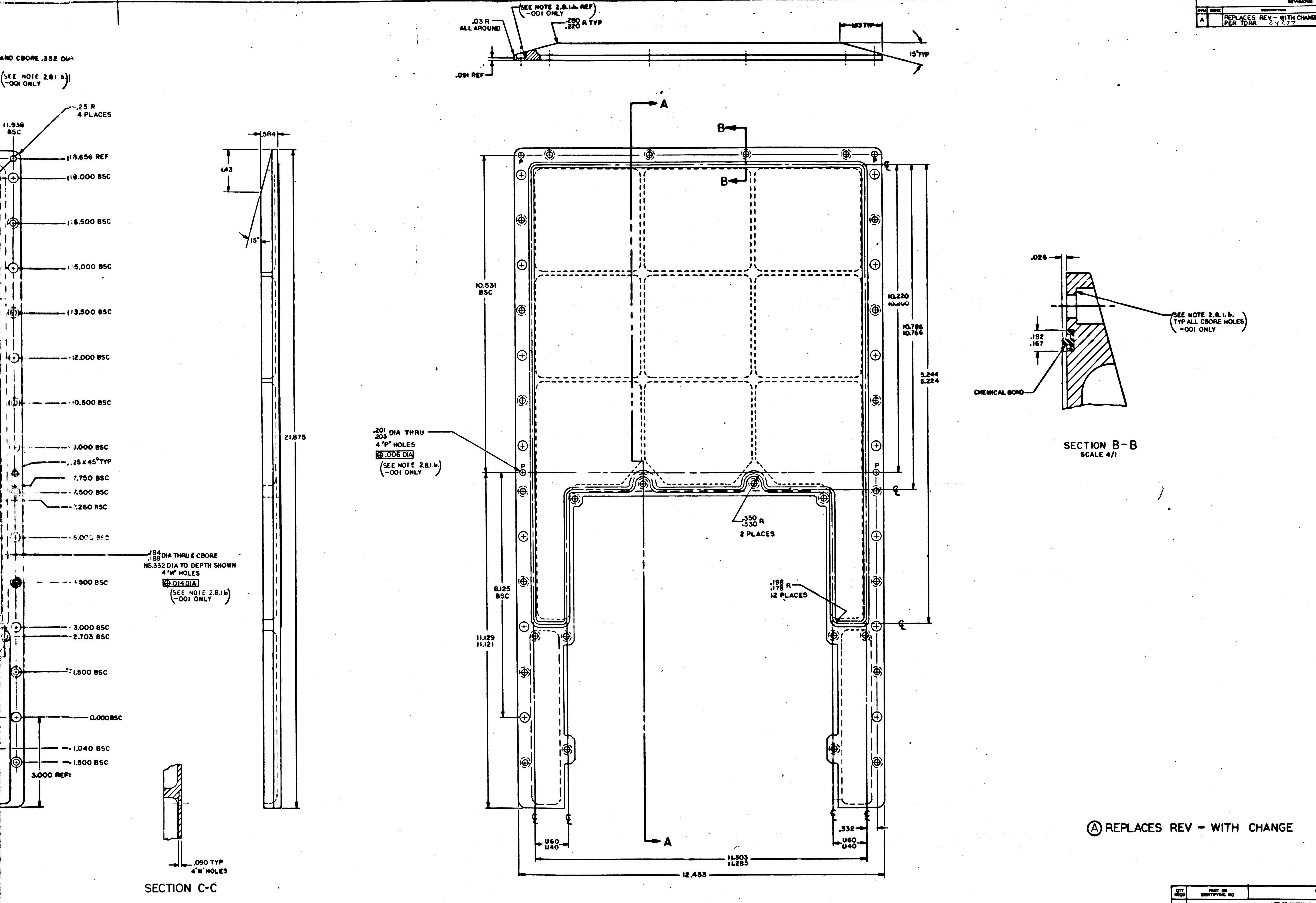
WIRE, ELECTRICAL, INSULATED, SOLID

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006376

SCALE NONE SHEET 1 OF 1

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277			11-23-67	LK



AND CBORE .332 DIA
(SEE NOTE 2.8.1 b) -001 ONLY)
.25 R 4 PLACES
11.938 BSC
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
1.040 BSC
1.500 BSC
3.000 REF
.584
1.43
15°
21.875
.184 .188 DIA THRU & CBORE
NS.332 DIA TO DEPTH SHOWN
4 "M" HOLES
.014 DIA
(SEE NOTE 2.8.1.b) -001 ONLY)
.090 TYP 4 "M" HOLES
SECTION C-C
.03 R ALL AROUND
(SEE NOTE 2.8.1.b. REF) -001 ONLY)
.230 .220 R TYP
.163 TYP
15° TYP
.091 REF
A
B
B
10.531 BSC
.201 .203 DIA THRU
4 "P" HOLES
.006 DIA
(SEE NOTE 2.8.1.b.) -001 ONLY)
P
P
P
P
10.220 10.200
10.786 10.766
5.244 5.224
.350 .330 R 2 PLACES
8.125 BSC
11.129 11.121
.198 .178 R 12 PLACES
.332
1.160 1.140
1.160 1.140
11.303 11.283
12.433
A
.026
SEE NOTE 2.8.1.b. TYP ALL CBORE HOLES -001 ONLY)
.182 .167
CHEMICAL BOND
SECTION B-B
SCALE 4/1

Ⓐ REPLACES REV - WITH CHANGE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ±.005 .XX ±.01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

NEXT ASSY | USED ON
APPLICATION

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN A. Addams 23 Nov 65
CHECKED C. Bunguleany 23 Nov 65
APPROVED
APPROVED Ellen Cahill 23 Nov 65
APPROVED MIT W Kupfer
APPROVED MSC C. Metzger
DATE

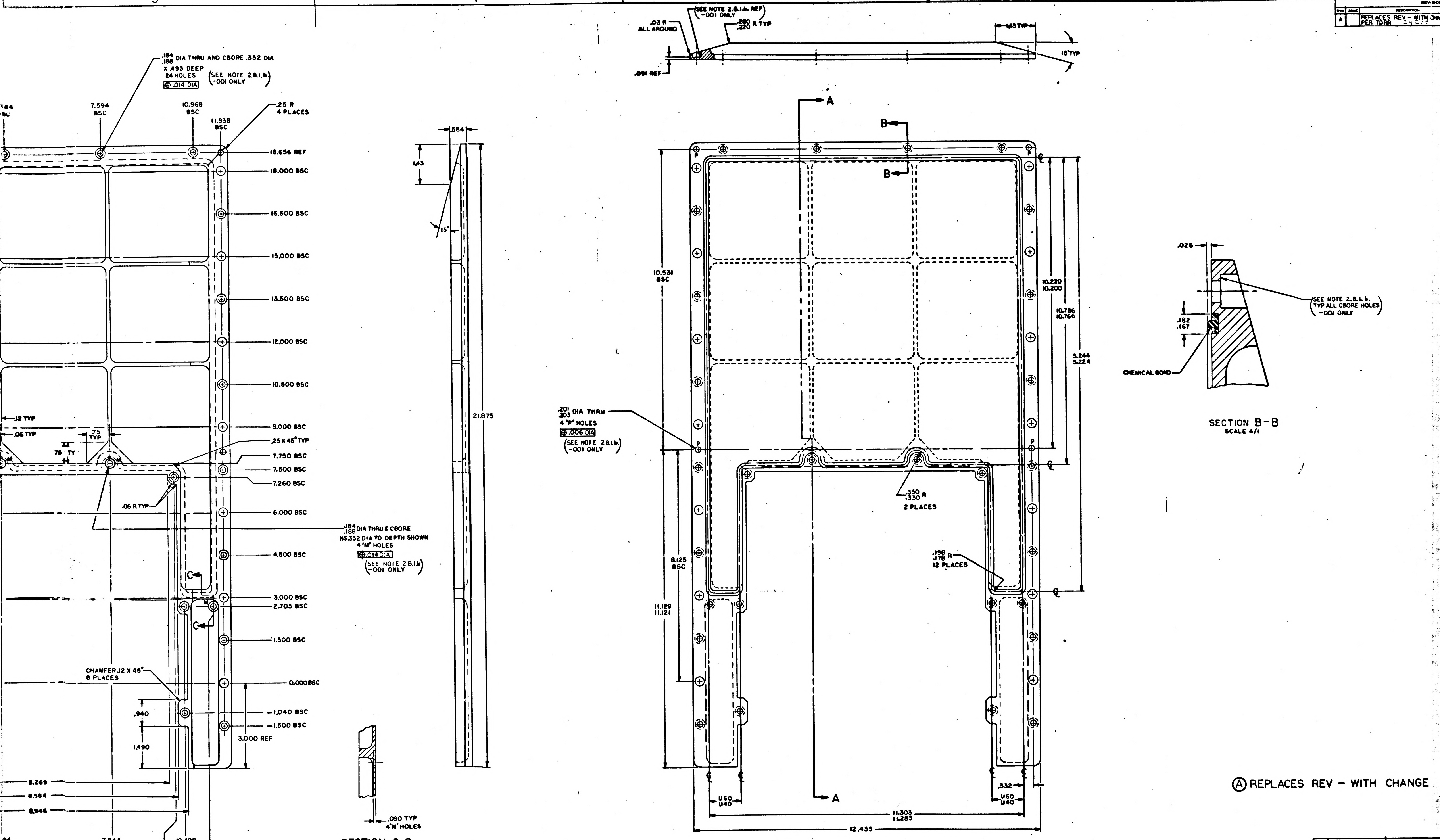
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 | SIZE J | DRAWING NO. 1006378
SCALE 1/1 | SHEET | OF

1006378 A

SYM	ZONE	DESCRIPTION	BY	DATE
A		REPLACES REV - WITH CHANGE PER TDRR 24377		



5
4
3
2
1
.03 R ALL AROUND
SEE NOTE 2.8.1.b. REF -001 ONLY
.280 .220 R TYP
1.63 TYP
15° TYP
.091 REF
.184 .188 DIA THRU AND CBORE .332 DIA X .493 DEEP 24 HOLES
(SEE NOTE 2.8.1.b. -001 ONLY)
⊕ .014 DIA
7.594 BSC
10.969 BSC
11.938 BSC
.25 R 4 PLACES
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
-1.040 BSC
-1.500 BSC
3.000 REF
.12 TYP
.06 TYP
.75 TYP
.44 .75 TY
.06 R TYP
CHAMFER .12 X 45° 8 PLACES
.940
1.490
8.269
8.584
8.946
7.844 BSC
10.498 BSC
10.168 BSC
11.563 BSC
.184 .188 DIA THRU & CBORE NS.332 DIA TO DEPTH SHOWN 4 'M' HOLES
⊕ .014 DIA
(SEE NOTE 2.8.1.b -001 ONLY)
C
M
.584
1.43
15°
21.875
.090 TYP 4 'M' HOLES
SECTION C-C
A
B
.201 .203 DIA THRU 4 'P' HOLES
⊕ .006 DIA
(SEE NOTE 2.8.1.b -001 ONLY)
P
10.531 BSC
8.125 BSC
11.129 11.121
10.220 10.200
10.786 10.766
5.244 5.224
.350 .330 R 2 PLACES
.198 .178 R 12 PLACES
℄
1.160 1.140
.332
11.303 11.283
12.433
.026
.182 .167
CHEMICAL BOND
SEE NOTE 2.8.1.b. TYP ALL CBORE HOLES -001 ONLY
SECTION B-B
SCALE 4/1

Ⓐ REPLACES REV - WITH CHANGE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN [illegible]
CHECKED [illegible]
APPROVED
APPROVED [illegible]
APPROVED MIT [illegible]
APPROVED MSC C. METZ[illegible]
DATE

MANNED SPACECRAFT
HOUSTON, TEXAS

GASKET, RET

SPECIFICATION CONTRO

CODE IDENT NO. 80230
SIZE J
100

SCALE 1/1

1006378 A

E-2

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4

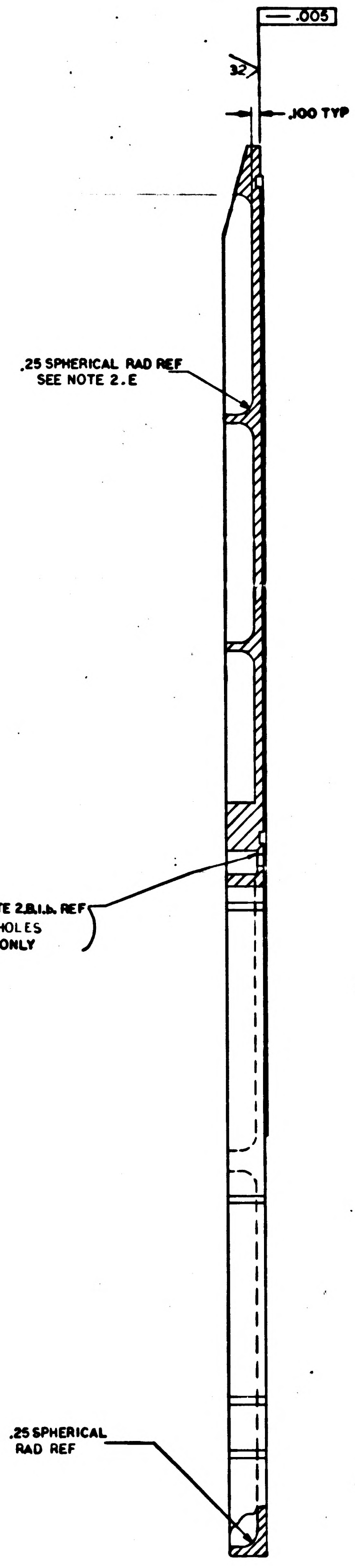
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3230.
   - B. FINISH:
     - (1) RETAINER:
       - a.) SEE CHART
       - b.) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125✓ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. ALL INSIDE RADII TO BE .25 SPHERICAL
   - F. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELUIM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE.

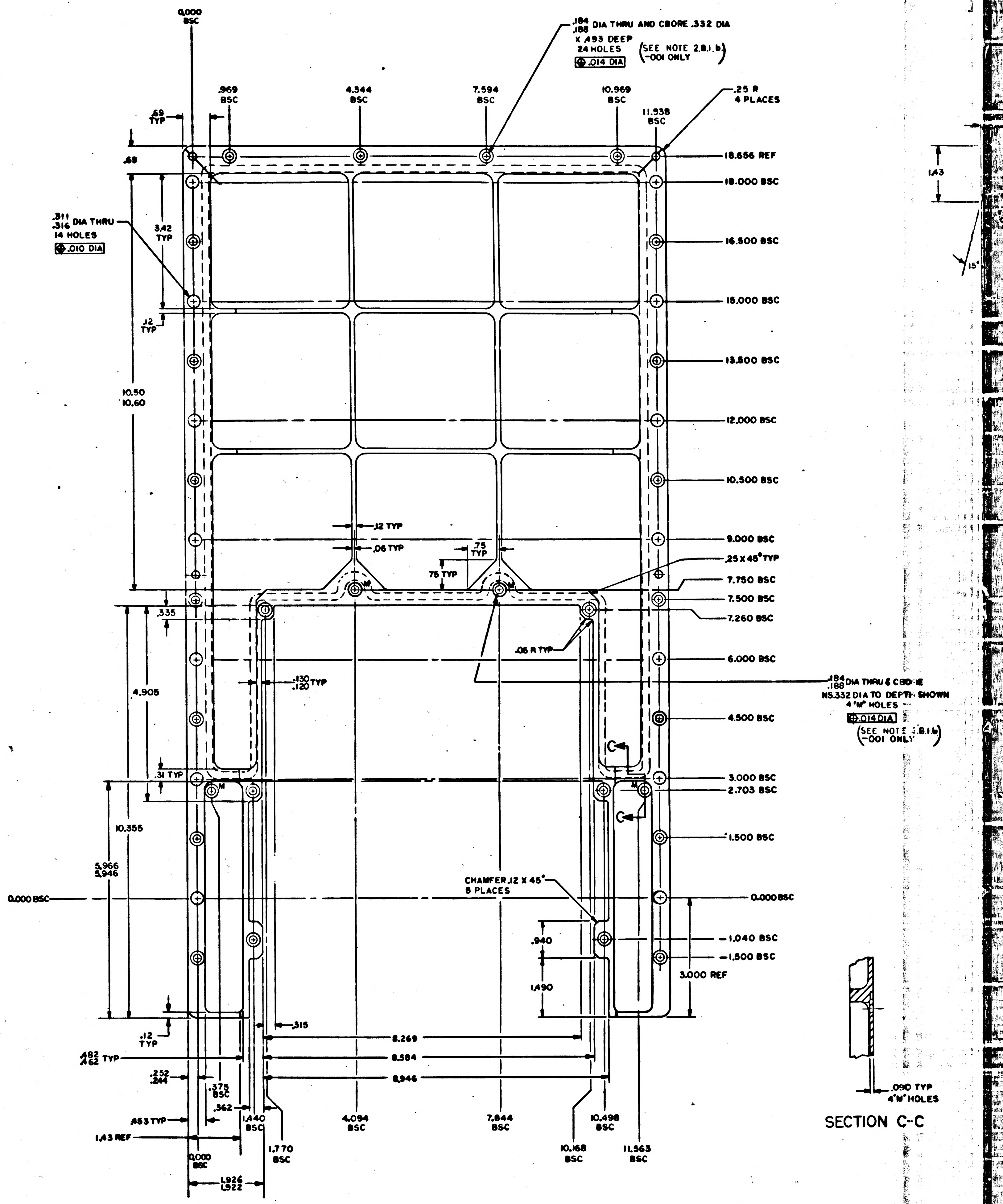
PART NO.	MATERIAL	FINISH	REMARKS
1006378-001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	ANODIZE PER MIL-M-45202 TYPE I, CLASS C	SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER ND1002040. DO NOT EPOXY COAT, ELECTRICAL BONDING REQUIRED
1006378-002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541, TYPE II GRADE C, CLASS 3	

3H

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002038 FOR THIS DRAWING.


.005
32
.100 TYP
.25 SPHERICAL RAD REF
SEE NOTE 2.E
SEE NOTE 2.B.1.b. REF
'M' HOLES
-001 ONLY
.25 SPHERICAL
RAD REF

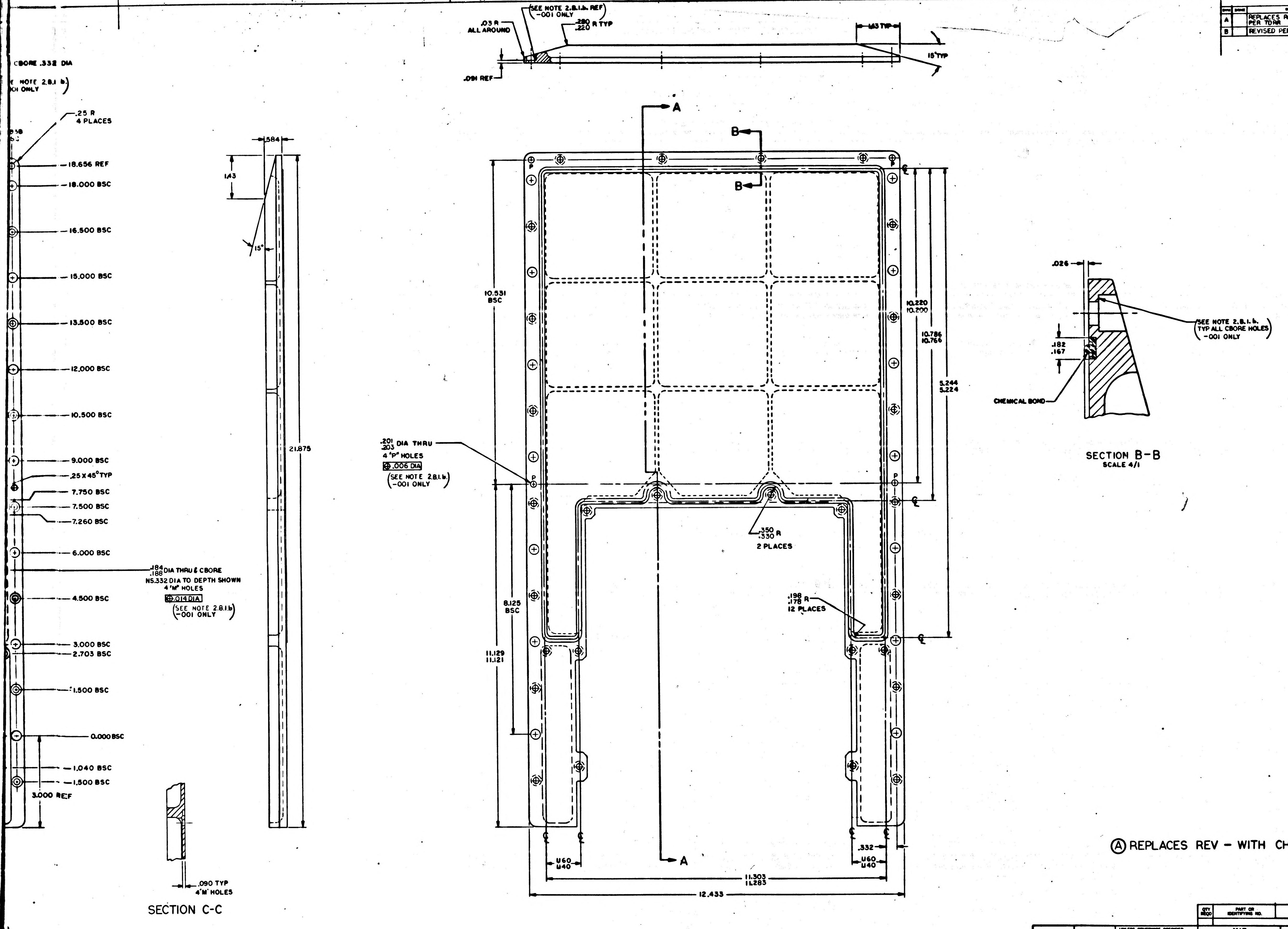
SECTION A-A


0.000 BSC
.184 .188 DIA THRU AND CBORE .332 DIA X .493 DEEP 24 HOLES
(SEE NOTE 2.B.1.b) -001 ONLY
.014 DIA
.969 BSC
4.344 BSC
7.594 BSC
10.969 BSC
11.938 BSC
.25 R 4 PLACES
.69 TYP
.69
18.656 REF
18.000 BSC
.311 .316 DIA THRU 14 HOLES
.010 DIA
3.42 TYP
16.500 BSC
15.000 BSC
.12 TYP
13.500 BSC
10.50 10.60
12.000 BSC
10.500 BSC
.12 TYP
.06 TYP
.75 TYP
75 TYP
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
.335
7.260 BSC
.06 R TYP
6.000 BSC
.130 .120 TYP
.184 .188 DIA THRU & CBORE .332 DIA TO DEPTH SHOWN 4 'M' HOLES
.014 DIA
(SEE NOTE 2.B.1.b -001 ONLY)
4.905
4.500 BSC
C
M
.31 TYP
3.000 BSC
2.703 BSC
10.355
1.500 BSC
5.966 5.946
0.000 BSC
CHAMFER .12 X 45° 8 PLACES
0.000 BSC
.940
1.040 BSC
1.500 BSC
3.000 REF
1.490
.12 TYP
.315
.482 .462 TYP
8.269
8.584
8.946
.252 .244
.375 BSC
.362
.453 TYP
1.43 REF
1.440 BSC
1.770 BSC
4.094 BSC
7.844 BSC
10.498 BSC
10.168 BSC
11.563 BSC
0.000 BSC
1.926 1.922
.090 TYP 4 'M' HOLES
1.43
15°

SECTION C-C

1006378 A

REVISIONS						
SYM	ZONE	DESCRIPTION	BY	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277			11-23-65	WK
B		REVISED PER TDRR 25936			2/15/66	WK



4
3
2
1
D
C
B
A
.03 R ALL AROUND
SEE NOTE 2.8.1.b. REF -001 ONLY
.280 .220 R TYP
1.43 TYP
15° TYP
.091 REF
CBORE .332 DIA
SEE NOTE 2.8.1 b. -001 ONLY
.25 R 4 PLACES
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
.184 .186 DIA THRU & CBORE
NS.332 DIA TO DEPTH SHOWN
4 "M" HOLES
⊕ .014 DIA
SEE NOTE 2.8.1.b -001 ONLY
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
1.040 BSC
1.500 BSC
3.000 REF
.584
1.43
15°
21.875
.090 TYP
4 "M" HOLES
SECTION C-C
A
B
B
A
10.531 BSC
.201 .203 DIA THRU
4 "P" HOLES
⊕ .006 DIA
SEE NOTE 2.8.1.b. -001 ONLY
P
P
P
P
10.220 10.200
10.786 10.766
5.244 5.224
.350 .330 R
2 PLACES
.198 .178 R
12 PLACES
8.125 BSC
11.129 11.121
1.160 1.140
1.160 1.140
.332
11.303 11.283
12.433
.026
SEE NOTE 2.8.1.b. TYP ALL CBORE HOLES -001 ONLY
.182 .167
CHEMICAL BOND
SECTION B-B
SCALE 4/1

Ⓐ REPLACES REV - WITH CHANGE

F3

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN A. Addario Jr. 23 Nov 65
CHECKED R. C. Kingsbury 23 Nov 65
APPROVED
APPROVED Ellen C. Hall 23 Nov 65
APPROVED MIT W. Keefer 23 Nov 65
APPROVED NASA C. METZGER
DATE

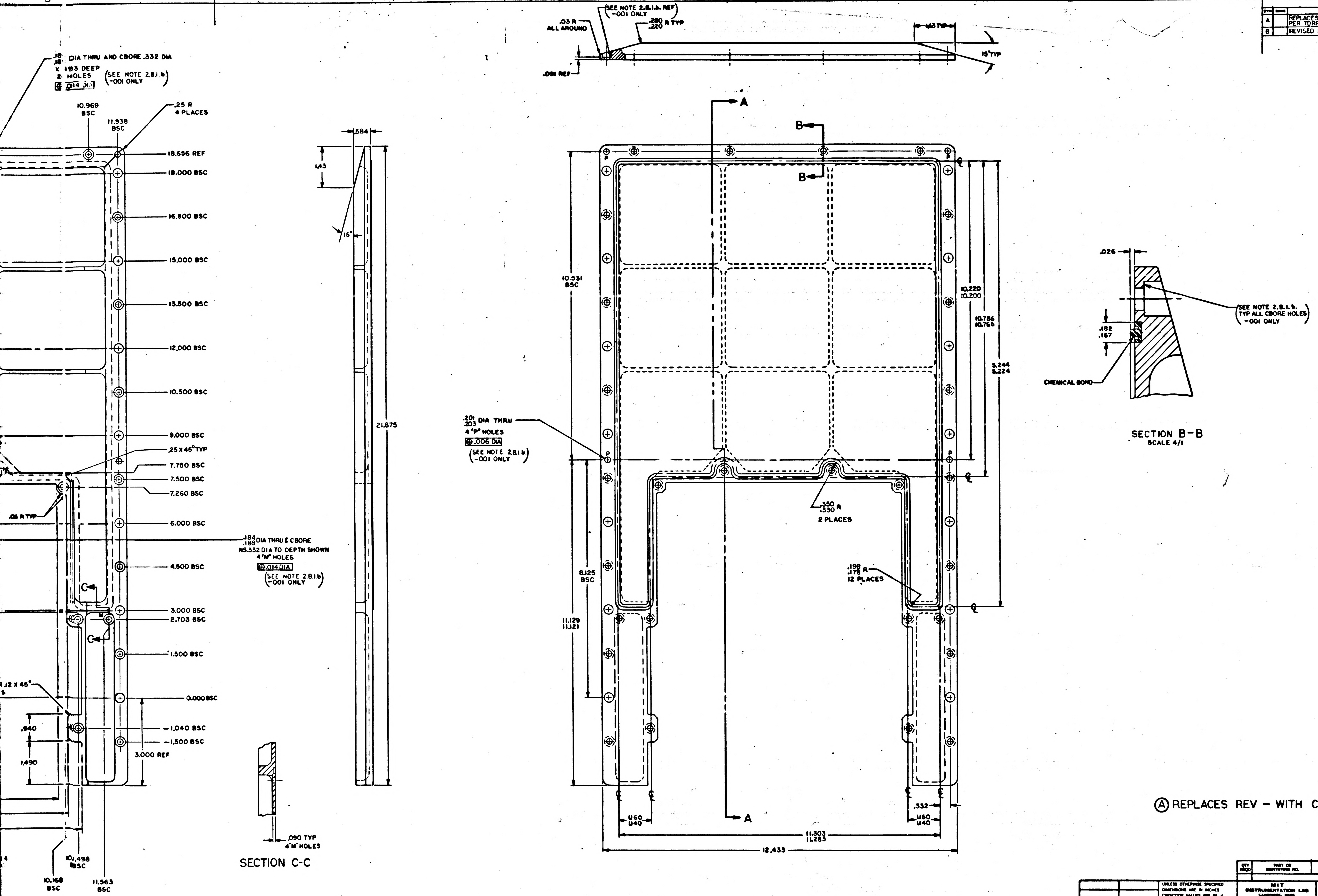
GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE J
DRAWING NO. 1006378
SCALE 1/1
SHEET 1 OF 1

1006378 B

1006378 B

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277				LK
B		REVISED PER TDRR 25936				



SEE NOTE 2.8.1.b REF
-001 ONLY
.03 R ALL AROUND
.280 .220 R TYP
.143 TYP
15° TYP
.091 REF
.18 .181 DIA THRU AND CBORE .332 DIA
X .193 DEEP
2 HOLES
(SEE NOTE 2.8.1.b)
-001 ONLY
.014
10.969 BSC
11.938 BSC
.25 R 4 PLACES
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
.03 R TYP
6.000 BSC
.184 .188 DIA THRU & CBORE
NS.332 DIA TO DEPTH SHOWN
4 "M" HOLES
.014 DIA
(SEE NOTE 2.8.1.b)
-001 ONLY
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
.12 X 45°
0.000 BSC
-1.040 BSC
-1.500 BSC
.940
1.490
3.000 REF
10.498 BSC
10.168 BSC
11.563 BSC
C
M
.584
1.43
15°
21.875
.090 TYP
4 "M" HOLES
SECTION C-C
A
B
.201 .203 DIA THRU
4 "P" HOLES
.006 DIA
(SEE NOTE 2.8.1.b)
-001 ONLY
P
10.531 BSC
8.125 BSC
11.129 11.121
10.220 10.200
10.786 10.766
5.244 5.224
.350 .330 R
2 PLACES
.198 .178 R
12 PLACES
1.160 1.140
.332
11.303 11.283
12.433
.026
.182 .167
SEE NOTE 2.8.1.b
TYP ALL CBORE HOLES
-001 ONLY
CHEMICAL BOND
SECTION B-B
SCALE 4/1

Ⓐ REPLACES REV - WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS XXX ±.005 XX ±.01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

NEXT ASSY | USED ON
APPLICATION

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN 23 NOV 65
CHECKED 23 NOV 65
APPROVED
APPROVED
APPROVED MIT
APPROVED MSC C. METZ
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 | SIZE J | DRAWING NO. 1006378
SCALE 1/1 | SHEET 1 OF 1

F2

MASTER

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER:
       - a.) SEE CHART
       - b.) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. ALL INSIDE RADII TO BE .25 SPHERICAL
   - F. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

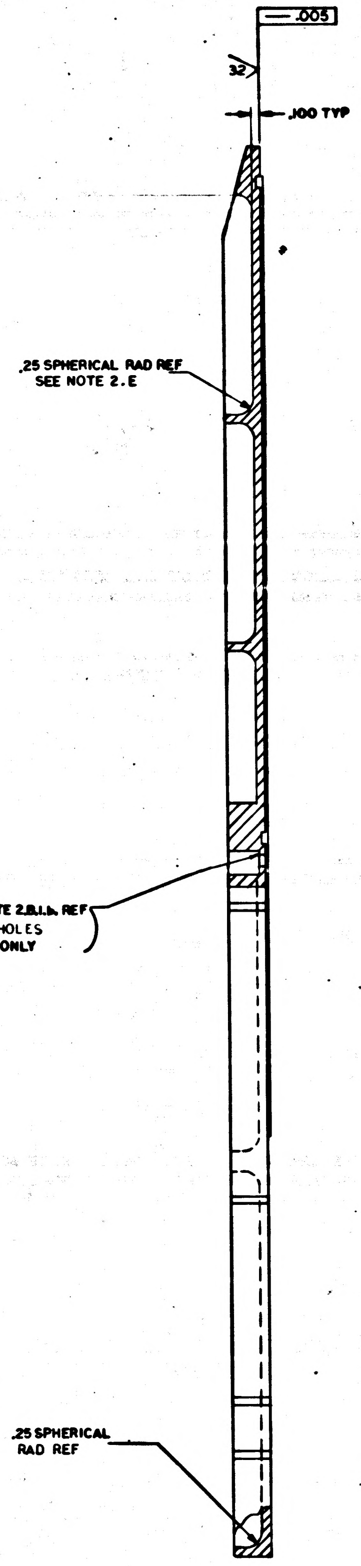
3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELUIM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE.

PART NO.	MATERIAL	FINISH	REMARKS
1006378-001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	FINISH PER ______	SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER DO NOT EPOXY COAT, ELECTRICAL BONDING REQUIRED
1006378-002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541, TYPE II GRADE C, CLASS 3	

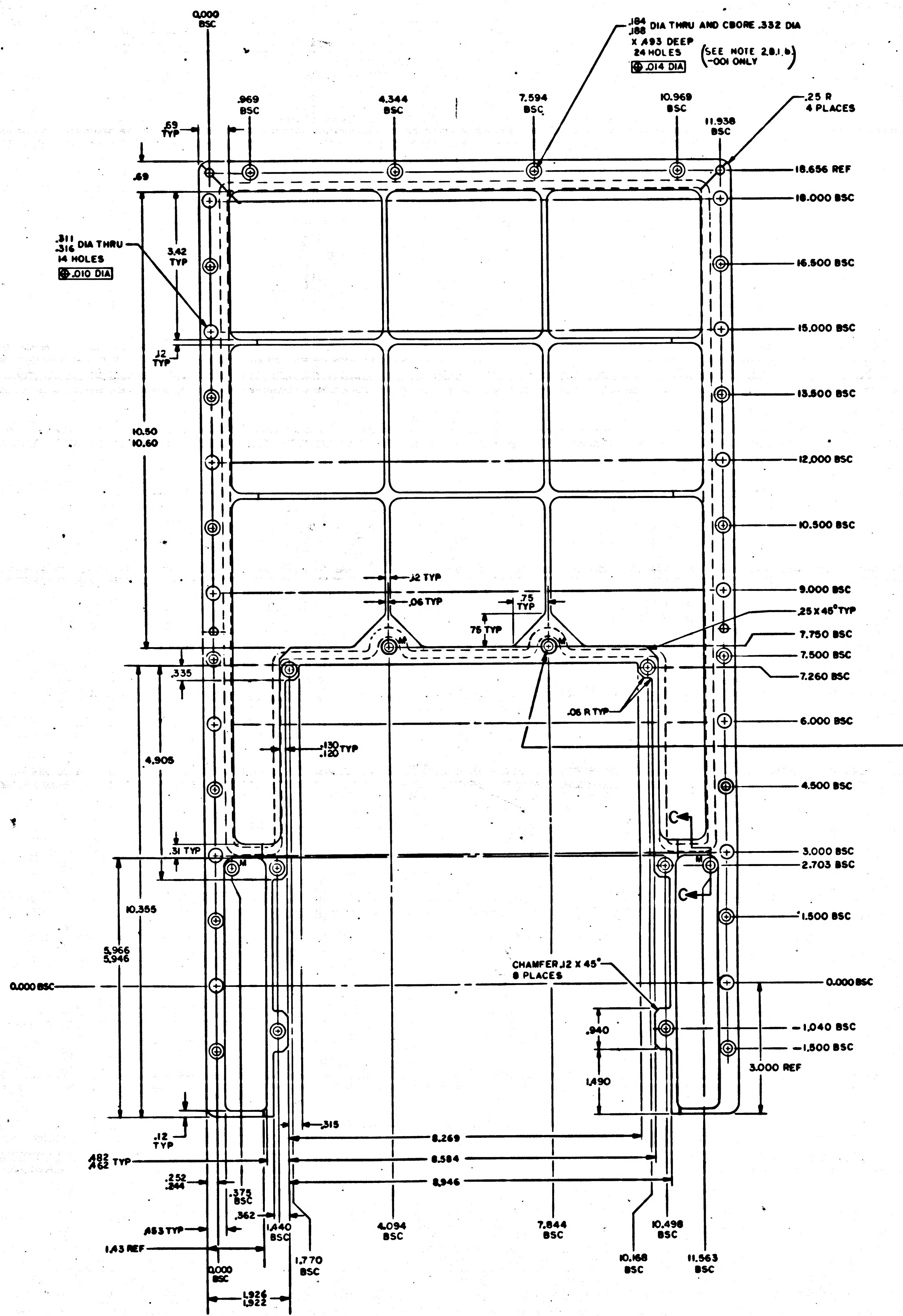
PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

3H

F-1


.005
32
.100 TYP
.25 SPHERICAL RAD REF
SEE NOTE 2.E
(SEE NOTE 2.B.1.b. REF
'M' HOLES
-001 ONLY)
.25 SPHERICAL
RAD REF

SECTION A-A


0.000
BSC
.969
BSC
4.344
BSC
7.594
BSC
10.969
BSC
11.938
BSC
.184
.188 DIA THRU AND CBORE .332 DIA
X .493 DEEP
24 HOLES
(SEE NOTE 2.B.1.b.)
-001 ONLY)
.014 DIA
.25 R
4 PLACES
.69
TYP
.69
.311
.316 DIA THRU
14 HOLES
.010 DIA
3.42
TYP
.12
TYP
10.50
10.60
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
-1.040 BSC
-1.500 BSC
3.000 REF
.12 TYP
.06 TYP
.75
TYP
.75 TYP
.06 R TYP
.130
.120 TYP
.184
.188 DIA THRU & CBORE
NS.332 DIA TO DEPTH SHOWN
4 'M' HOLES
.014 DIA
(SEE NOTE 2.B.1.b.
-001 ONLY)
.335
4.905
.31 TYP
10.355
5.966
5.946
0.000 BSC
C
C
M
CHAMFER .12 X 45°
8 PLACES
.940
1.490
.12
TYP
.482
.462 TYP
.252
.244
.375
BSC
.362
.453 TYP
1.43 REF
0.000
BSC
1.440
BSC
1.770
BSC
1.926
1.922
.315
8.269
8.584
8.946
4.094
BSC
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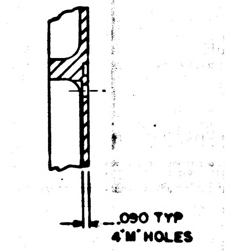
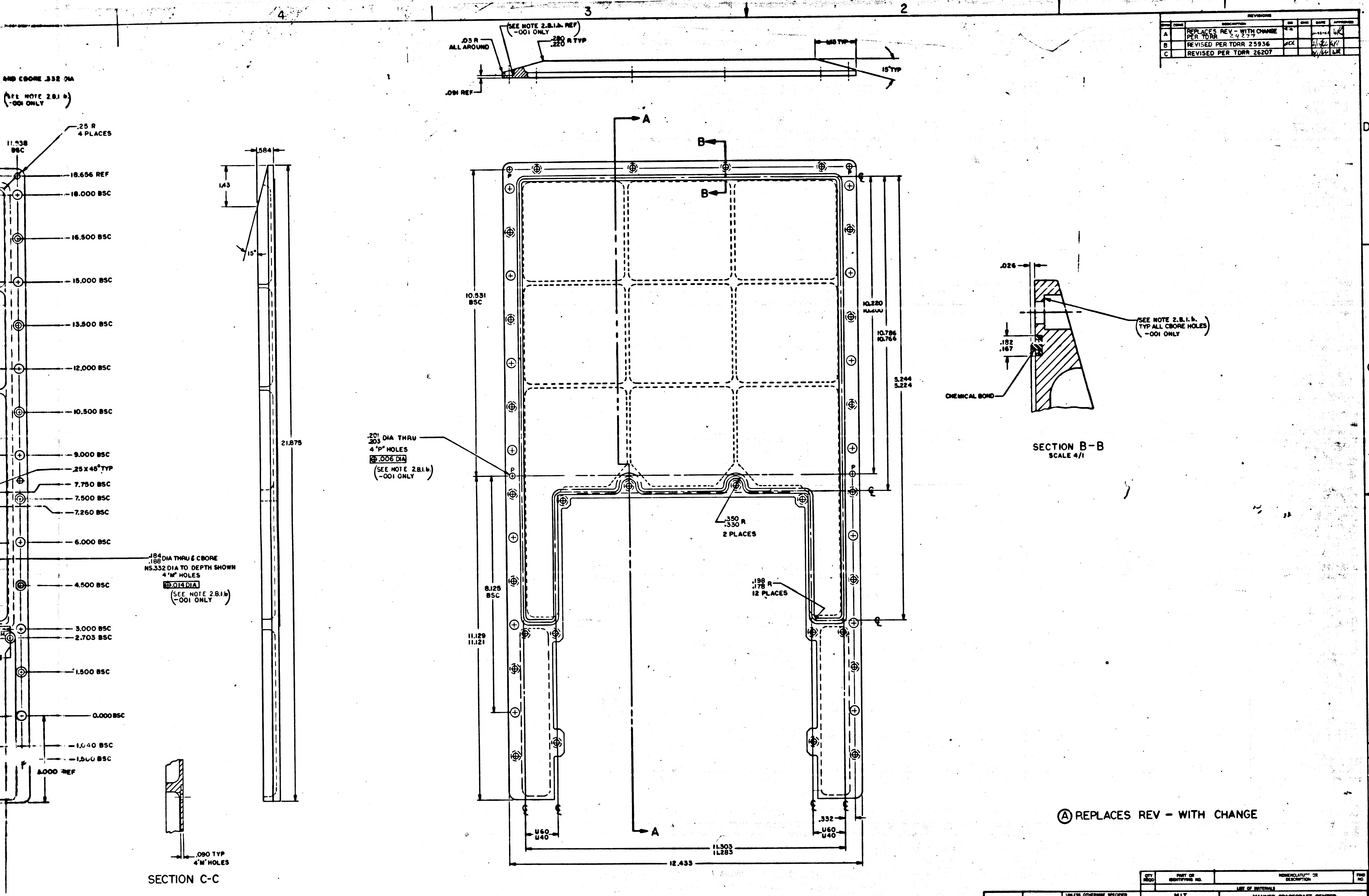
BSC
10.498
BSC
11.563
BSC


.090 TYP
4 'M' HOLES

SECTION C-C

1006378 B

SYM	ZONE	DESCRIPTION	BY	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277				WR
B		REVISED PER TDRR 25936			2/15/66	WR
C		REVISED PER TDRR 26207			/1/66	WR



4
3
2
1
AND CBORE .332 DIA
(SEE NOTE 2.B.1.b)
-001 ONLY
.25 R
4 PLACES
11.938 BSC
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
1.040 BSC
1.500 BSC
3.000 REF
.184/.188 DIA THRU & CBORE
NS.332 DIA TO DEPTH SHOWN
4 "M" HOLES
⊕ .014 DIA
(SEE NOTE 2.B.1.b)
-001 ONLY
.584
1.43
15°
21.875
.090 TYP
4 "M" HOLES
SECTION C-C
SEE NOTE 2.B.1.b REF
-001 ONLY
.03 R
ALL AROUND
.280/.220 R TYP
.091 REF
15° TYP
A
B
10.531 BSC
.201/.203 DIA THRU
4 "P" HOLES
⊕ .006 DIA
(SEE NOTE 2.B.1.b)
-001 ONLY
P
8.125 BSC
11.129/11.121
10.220
10.786/10.766
5.244/5.224
.350/.330 R
2 PLACES
.198/.178 R
12 PLACES
1.160/1.140
.332
11.303/11.283
12.433
.026
SEE NOTE 2.B.1.b.
TYP ALL CBORE HOLES
-001 ONLY
.182/.167
CHEMICAL BOND
SECTION B-B
SCALE 4/1
D
C
B
A

Ⓐ REPLACES REV - WITH CHANGE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN
CHECKED
APPROVED
APPROVED
APPROVED MIT
C. METZGER
APPROVED
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

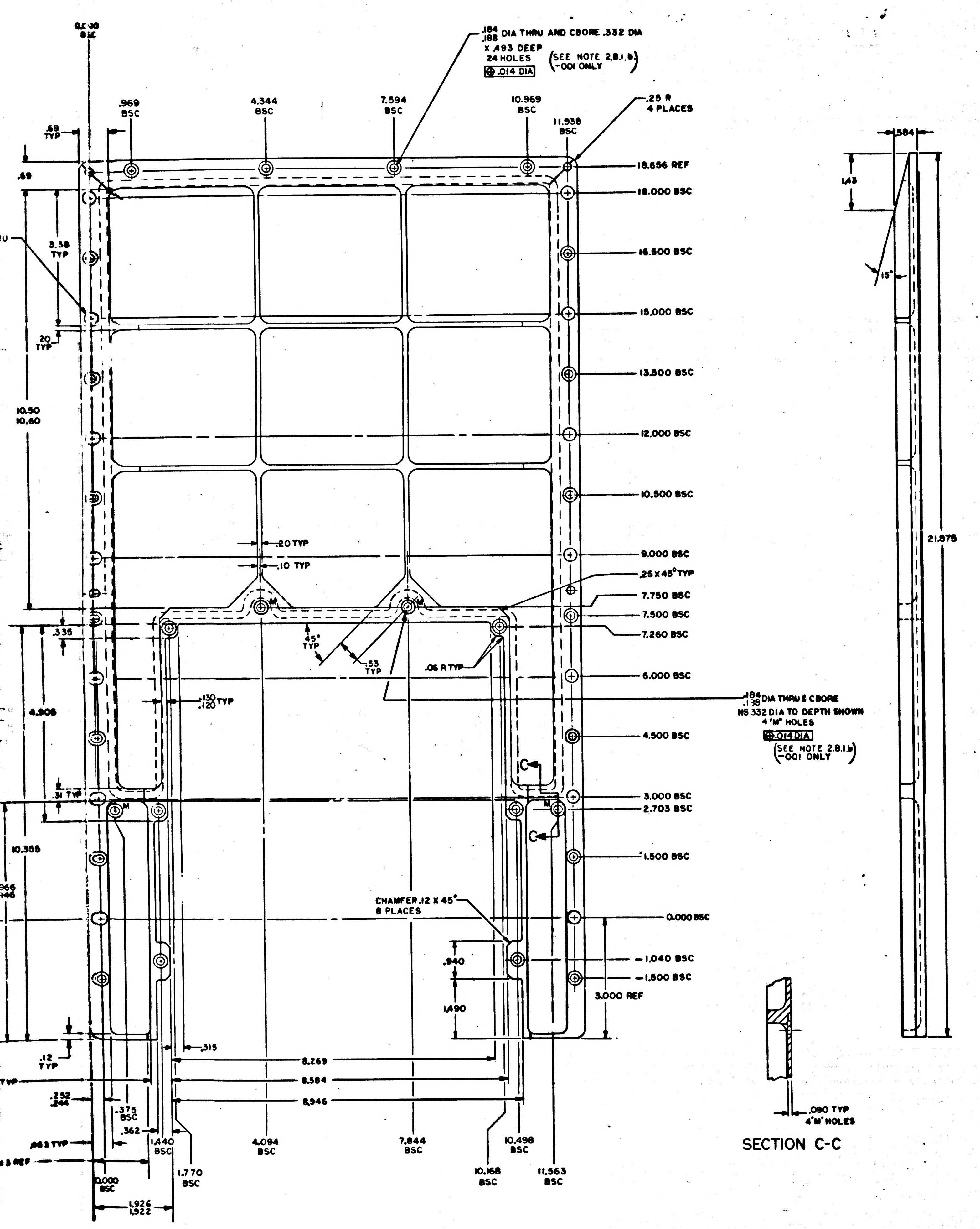
GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006378

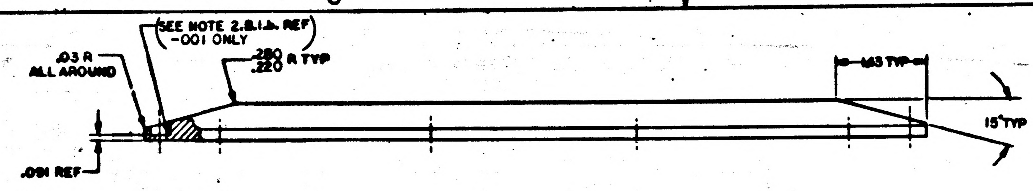
SCALE 1/1
SHEET 1 OF 1

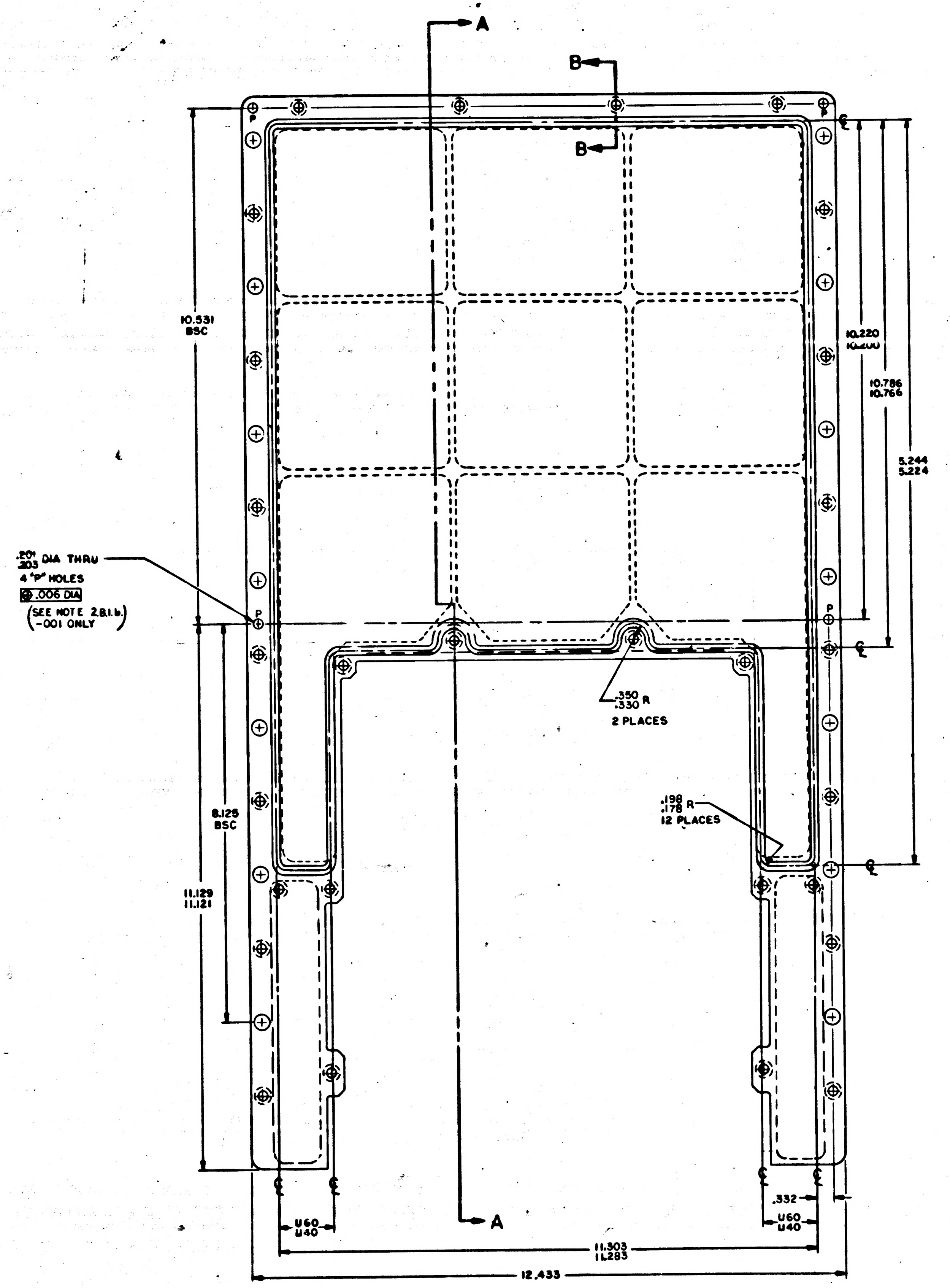
1006378 C

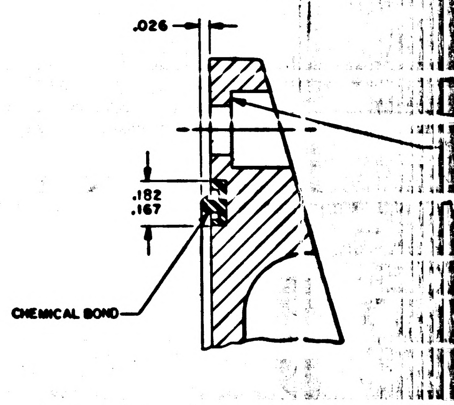
C


.184
.188 DIA THRU AND CBORE .332 DIA
X .493 DEEP
24 HOLES
.014 DIA
(SEE NOTE 2.8.1.b.
-001 ONLY)
.969 BSC
4.344 BSC
7.594 BSC
10.969 BSC
11.938 BSC
.25 R
4 PLACES
.69 TYP
.69
3.38 TYP
.20 TYP
10.50
10.60
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
-1.040 BSC
-1.500 BSC
3.000 REF
.20 TYP
.10 TYP
45° TYP
.53 TYP
.06 R TYP
.335
4.906
.130
.120 TYP
.184
.138 DIA THRU & CBORE
NS .332 DIA TO DEPTH SHOWN
4 "M" HOLES
.014 DIA
(SEE NOTE 2.8.1.b
-001 ONLY)
.31 TYP
10.355
CHAMFER .12 X 45°
8 PLACES
.940
1.490
.12 TYP
.315
8.269
8.584
8.946
.252
.244
.375 BSC
.362
1.440 BSC
1.770 BSC
4.094 BSC
7.844 BSC
10.168 BSC
10.498 BSC
11.563 BSC
0.000 BSC
1.926
1.922
.584
1.43
15°
21.875
.090 TYP
4 "M" HOLES
C
M

SECTION C-C


SEE NOTE 2.8.1.b. REF
-001 ONLY
.03 R
ALL AROUND
.280
.220 R TYP
1.43 TYP
15° TYP
.091 REF


A
B
B
10.531 BSC
.201
.203 DIA THRU
4 "P" HOLES
.006 DIA
(SEE NOTE 2.8.1.b.
-001 ONLY)
P
10.220
10.200
10.786
10.766
5.244
5.224
.350
.330 R
2 PLACES
8.125 BSC
.198
.178 R
12 PLACES
11.129
11.121
.332
1.160
1.140
11.303
11.283
12.433
A


.026
.182
.167
CHEMICAL BOND

SECTION B-B
SCALE 4/1

Ⓐ REPLACES

MASTER

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

NEXT ASSY | USED ON
APPLICATION

SEE REQUIREMENTS

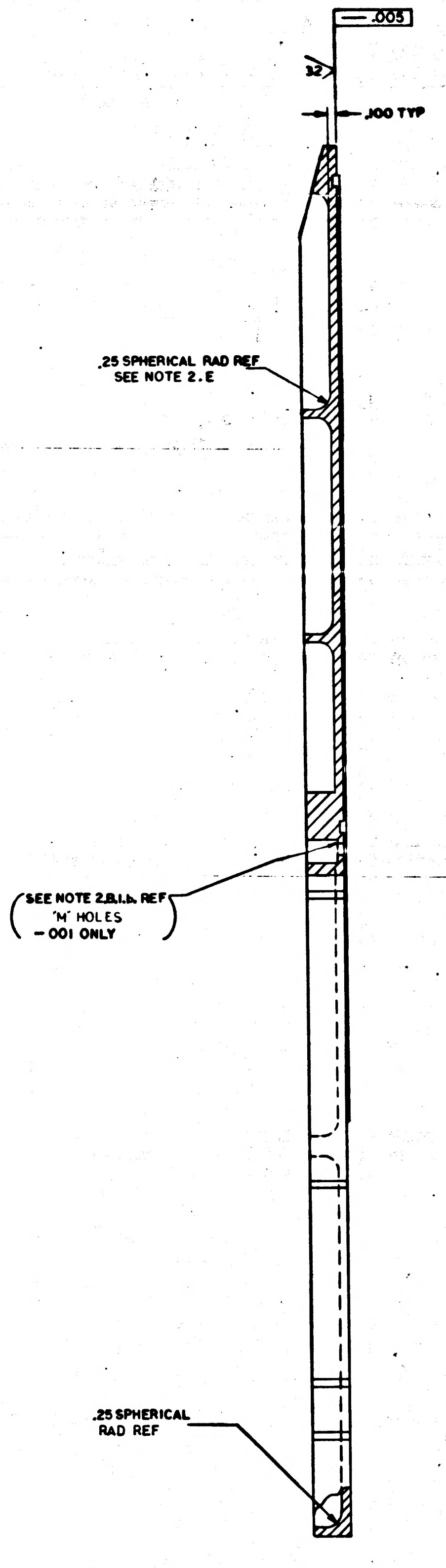
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER:
       - a.) SEE CHART
       - b.) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. ALL INSIDE RADII TO BE .25 SPHERICAL
   - F. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

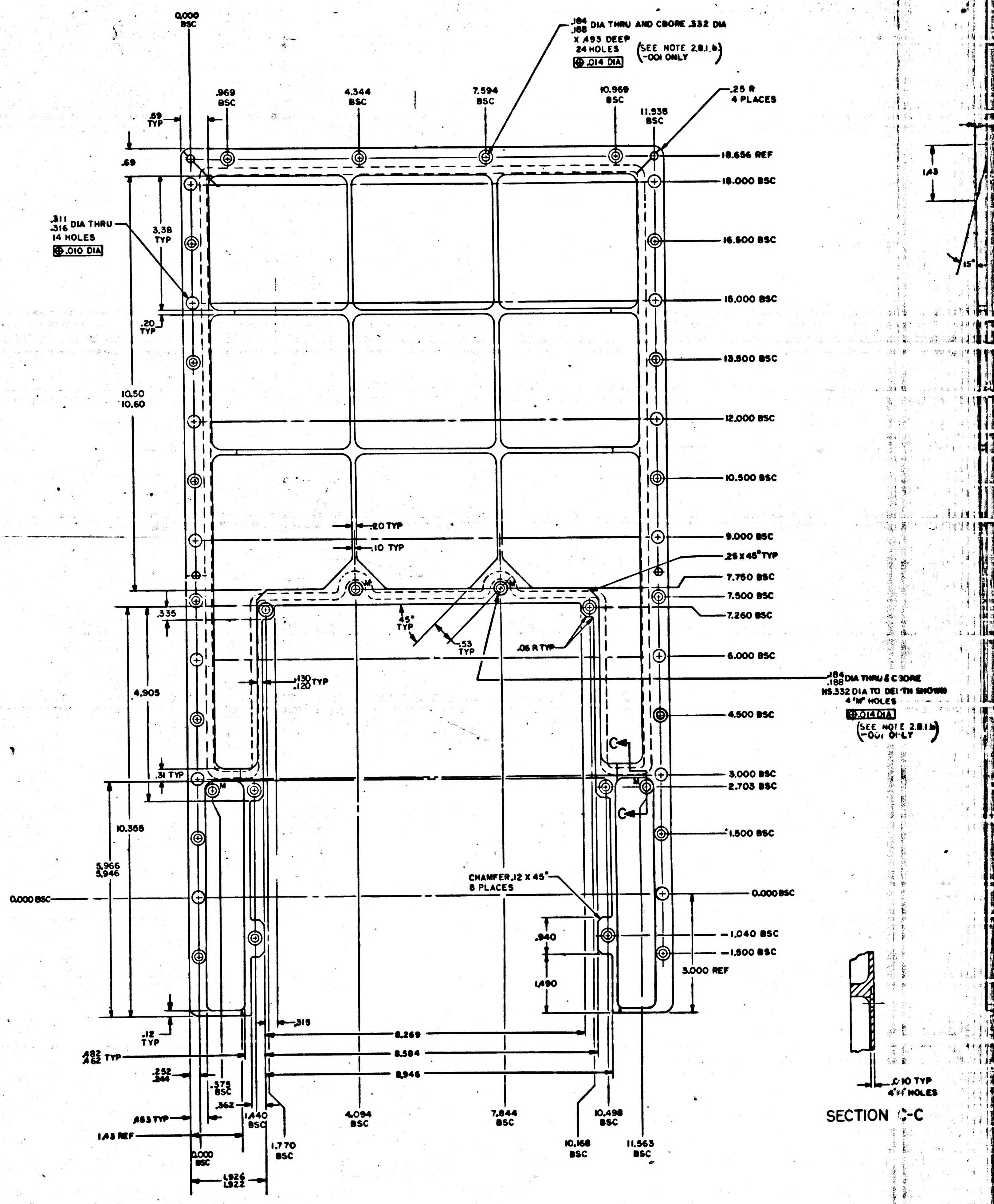
3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELUIM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE.

PART NO.	MATERIAL	FINISH	REMARKS
1006378-001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	FINISH PER ________	SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER DO NOT EPOXY COAT, ELECTRICAL BONDING REQUIRED
1006378-002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541, TYPE II GRADE C, CLASS 3	



.005
32
.100 TYP
.25 SPHERICAL RAD REF
SEE NOTE 2.E
SEE NOTE 2.B.1.b. REF
'M' HOLES
-001 ONLY
.25 SPHERICAL
RAD REF

SECTION A-A



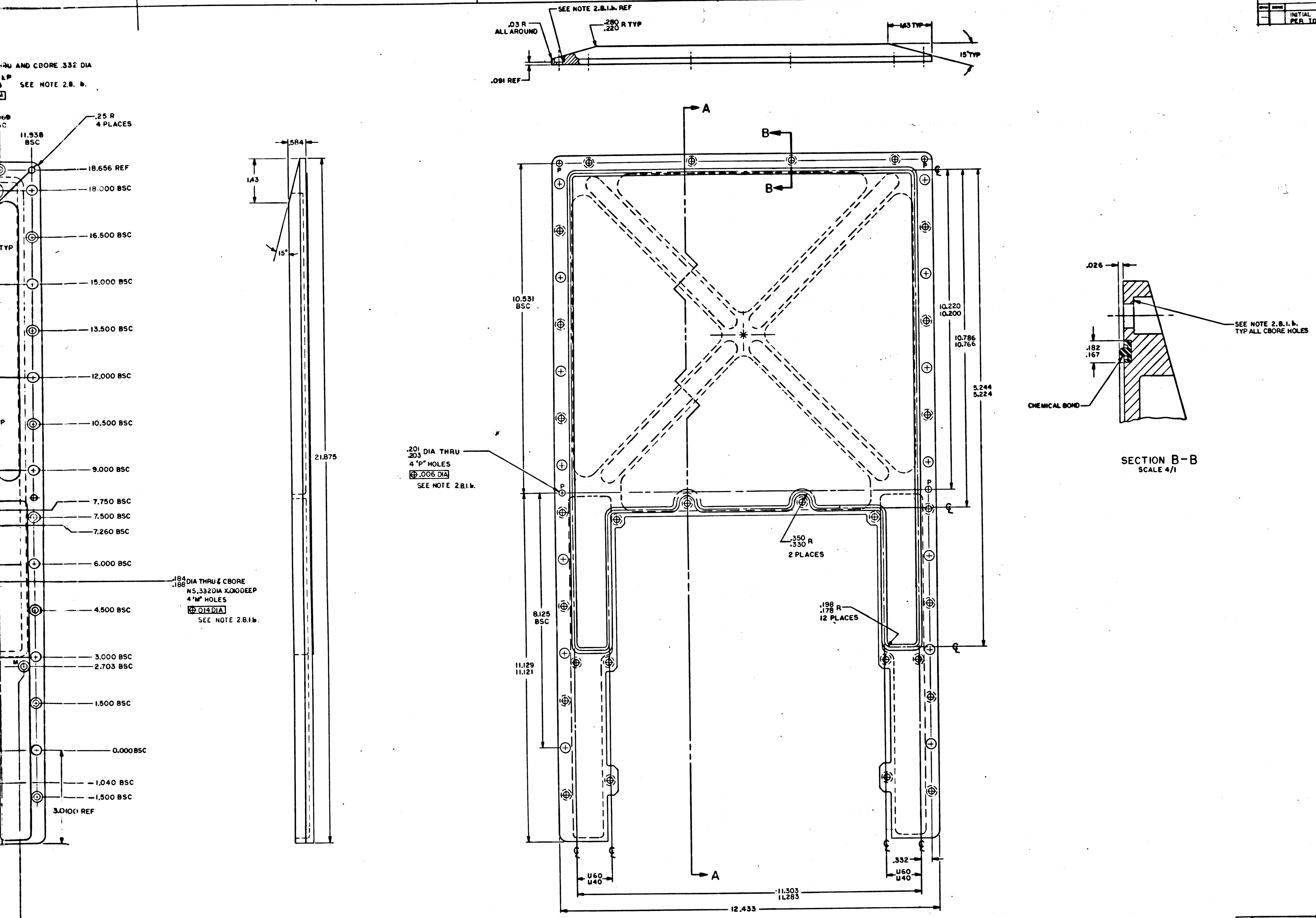
0.000 BSC
.969 BSC
4.344 BSC
7.594 BSC
10.969 BSC
11.938 BSC
.184 .188 DIA THRU AND CBORE .332 DIA X .493 DEEP 24 HOLES
.014 DIA
SEE NOTE 2.B.1.b. -001 ONLY
.25 R 4 PLACES
.69 TYP
.69
.311 .316 DIA THRU 14 HOLES
.010 DIA
3.38 TYP
.20 TYP
10.50 10.60
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
.25 X 45° TYP
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
-1.040 BSC
-1.800 BSC
3.000 REF
.20 TYP
.10 TYP
45° TYP
.53 TYP
.06 R TYP
.130 .120 TYP
.184 .188 DIA THRU & CBORE .332 DIA TO DEPTH SHOWN 4 "M" HOLES
.014 DIA
SEE NOTE 2.B.1.b. -001 ONLY
.335
4.905
.31 TYP
10.355
5.966 5.946
0.000 BSC
CHAMFER .12 X 45° 8 PLACES
.940
1.490
.315
.12 TYP
.482 .462 TYP
.252 .244
.375 BSC
.362
.453 TYP
1.43 REF
1.440 BSC
1.770 BSC
0.000 BSC
1.926 1.922
8.269
8.584
8.946
4.094 BSC
7.844 BSC
10.498 BSC
10.168 BSC
11.563 BSC
1.43
15°
.010 TYP 4 "I" HOLES
SECTION C-C
C

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

3H

1006378 C

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
REVISIONS						
—		INITIAL RELEASE CLASS A PER IDBR 23044			14/7/65	



.03 R ALL AROUND
SEE NOTE 2.8.1.b. REF
.280 .220 R TYP
.143 TYP
15° TYP
.091 REF
THRU AND CBORE .332 DIA
SEE NOTE 2.8. b.
.25 R 4 PLACES
11.938 BSC
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
1.040 BSC
1.500 BSC
3.0100 REF
11.965 BSC
.584
1.43
15°
21.875
A
B
10.531 BSC
10.220 10.200
10.786 10.766
5.244 5.224
.201 .203 DIA THRU
4 "P" HOLES
⊕ .006 DIA
SEE NOTE 2.8.1.b.
.184 .188 DIA THRU & CBORE
NS .332 DIA X.010 DEEP
4 "M" HOLES
⊕ .014 DIA
SEE NOTE 2.8.1.b.
P
M
8.125 BSC
11.129 11.121
.350 .330 R
2 PLACES
.198 .178 R
12 PLACES
.332
1.160 1.140
11.303 11.283
12.433
.026
SEE NOTE 2.8.1.b. TYP ALL CBORE HOLES
.182 .167
CHEMICAL BOND
SECTION B-B
SCALE 4/1

3#

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS XXX ±.005 XX ±.01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN 28 Sep 65
CHECKED R. Hong 10/7/65
APPROVED 10/7/65
APPROVED C. Hall 5 Oct 65
APPROVED MIT
NOT REQUIRED PER LETTER NASA PP7-65-612

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED

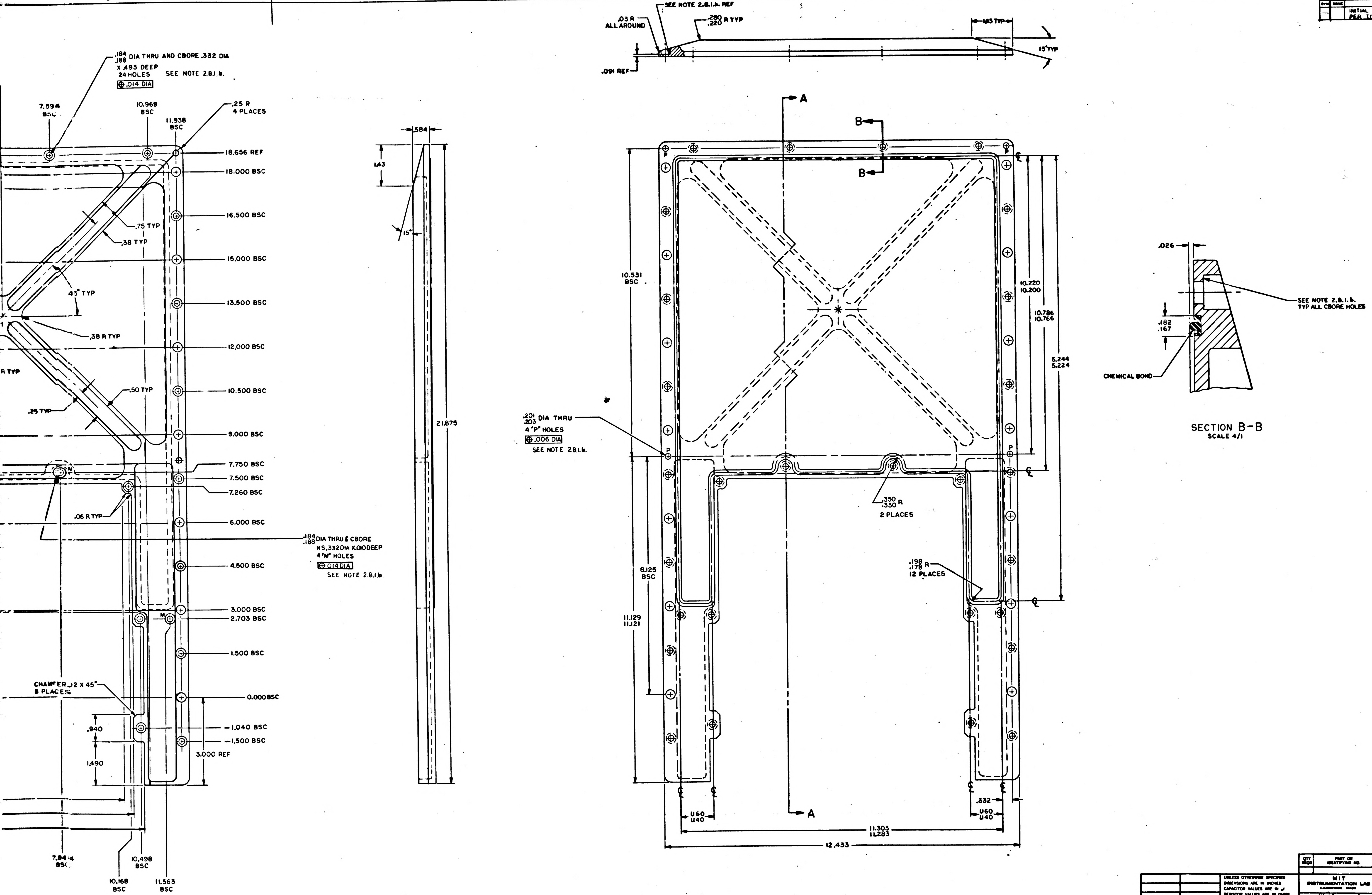
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006378

SCALE 1/1 SHEET 1 OF 1

1006378

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER IDRB 2304			65	



.184 .188 DIA THRU AND CBORE .332 DIA X .493 DEEP 24 HOLES
.014 DIA
SEE NOTE 2.8.1.b.
7.594 BSC
10.969 BSC
11.938 BSC
.25 R 4 PLACES
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
-1.040 BSC
-1.500 BSC
3.000 REF
.75 TYP
.38 TYP
45° TYP
.38 R TYP
R TYP
.50 TYP
.25 TYP
.06 R TYP
CHAMFER .12 X 45° 8 PLACES
.940
1.490
7.844 BSC
10.168 BSC
10.498 BSC
11.563 BSC
.184 .188 DIA THRU & CBORE NS .332 DIA X .010 DEEP 4 "M" HOLES
.014 DIA
SEE NOTE 2.8.1.b.
.584
1.43
15°
21.875
.03 R ALL AROUND
SEE NOTE 2.8.1.b. REF
.280 .220 R TYP
.091 REF
1.43 TYP
15° TYP
A
B
10.531 BSC
.201 .203 DIA THRU 4 "P" HOLES
.006 DIA
SEE NOTE 2.8.1.b.
8.125 BSC
11.129 11.121
10.220 10.200
10.786 10.766
5.244 5.224
.350 .330 R 2 PLACES
.198 .178 R 12 PLACES
1.160 1.140
.332
11.303 11.283
12.433
.026
.182 .167
SEE NOTE 2.8.1.b. TYP ALL CBORE HOLES
CHEMICAL BOND
SECTION B-B
SCALE 4/1

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS XXX ±.005 XX ±.01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN [illegible] 27Sep65
CHECKED [illegible] 10/7/65
APPROVED [illegible]
APPROVED [illegible] 5Oct65
APPROVED MIT [illegible]
NOT REQUIRED PER LETTER
APPROVED NASA PP7-0J-012
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006378

SCALE 1/1
SHEET

REQUIREMENTS:

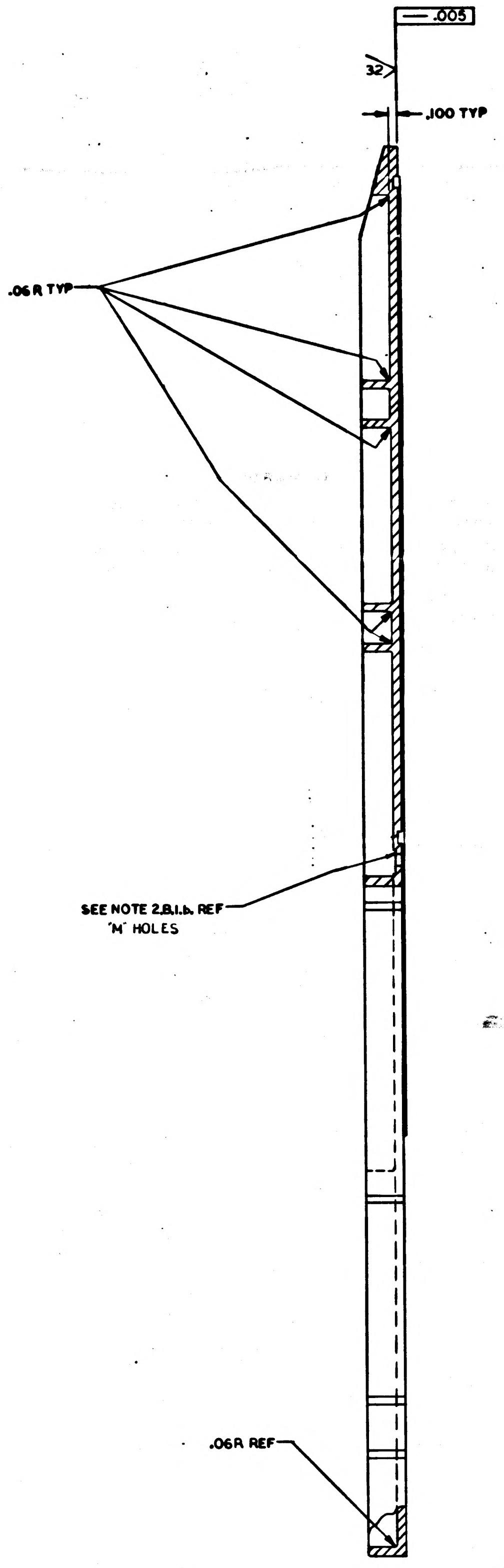
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: MAGNESIUM HK31A-H24 PER MIL-M-26075
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER:
       - a.) ANODIZE PER MIL-M-45202, TYPE 1, CLASS C
       - b.) SURFACE SHALL BE FREE OF ANODIZE TREAT PER 1002040. DO NOT EPOXYCOAT, ELECTRICAL BONDING REQUIRED.
   - C. SURFACE ROUGHNESS SHALL BE 125✓ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

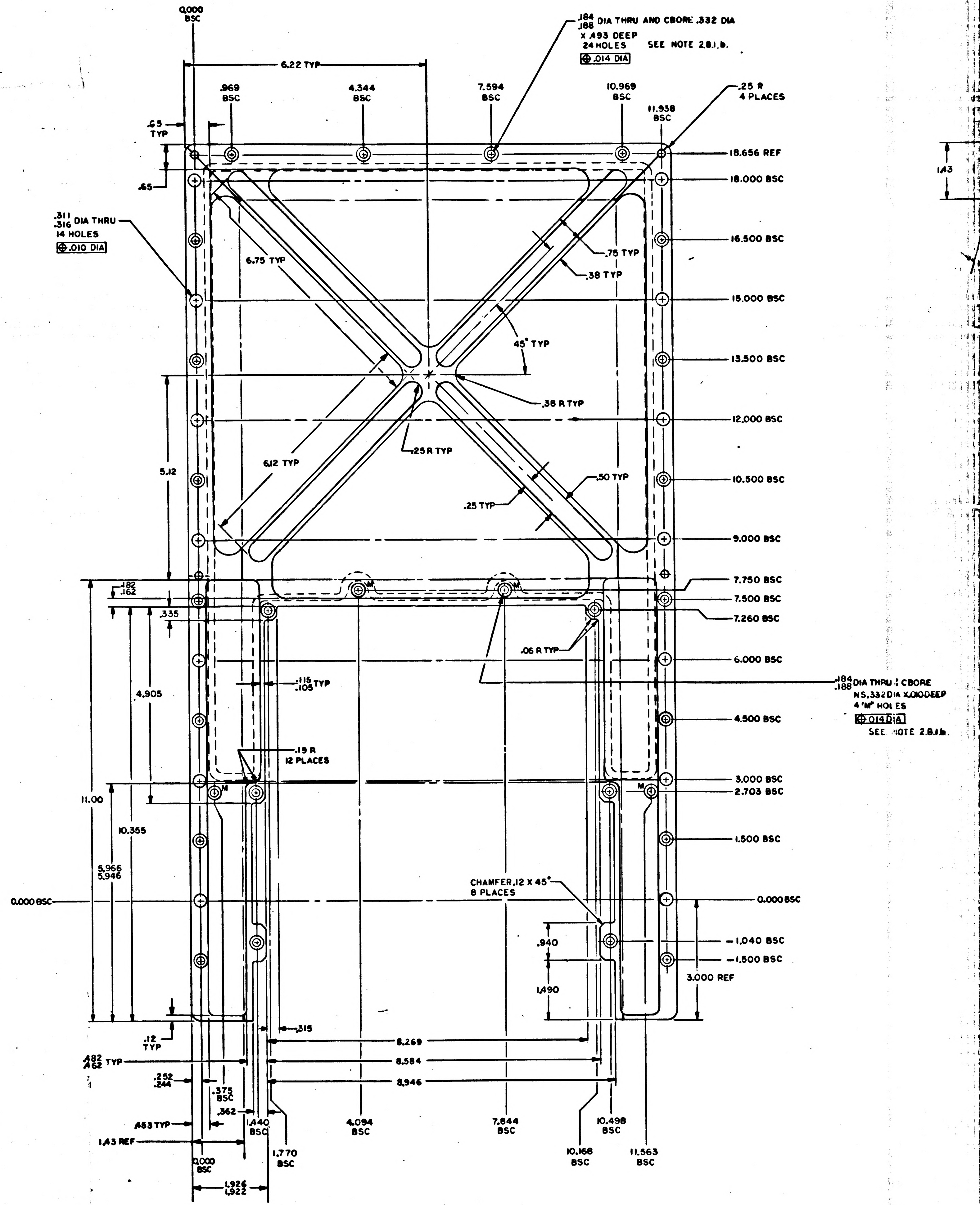
3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELUIM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002038 FOR THIS DRAWING.

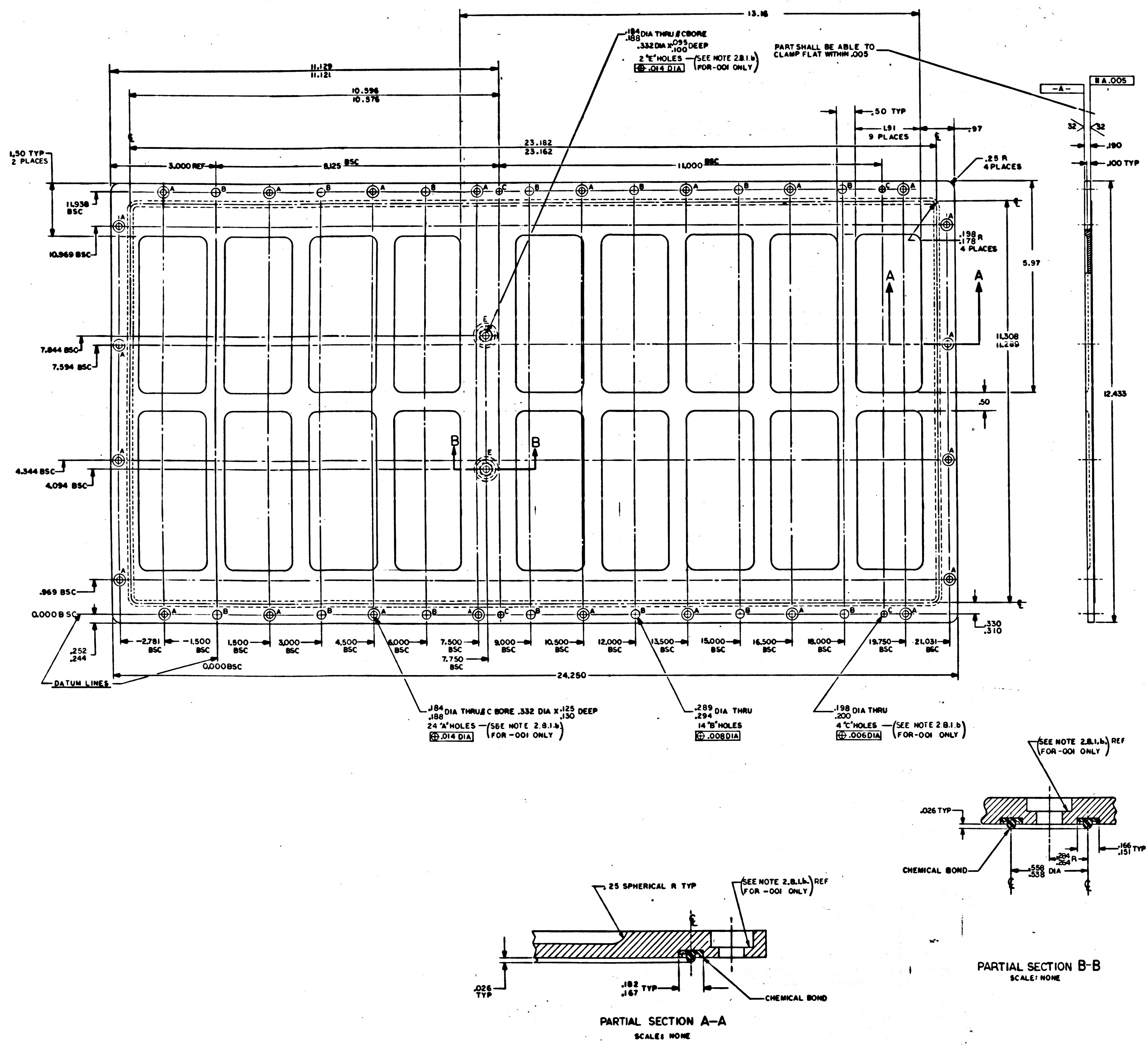
37


.005
32
.100 TYP
.06 R TYP
SEE NOTE 2.B.1.b. REF
'M' HOLES
.06R REF

SECTION A-A


0.000 BSC
6.22 TYP
.969 BSC
4.344 BSC
7.594 BSC
10.969 BSC
11.938 BSC
.184 .188 DIA THRU AND CBORE .332 DIA X .493 DEEP 24 HOLES SEE NOTE 2.B.1.b.
.014 DIA
.25 R 4 PLACES
.65 TYP
.65
1.43
18.656 REF
18.000 BSC
16.500 BSC
15.000 BSC
13.500 BSC
12.000 BSC
10.500 BSC
9.000 BSC
7.750 BSC
7.500 BSC
7.260 BSC
6.000 BSC
4.500 BSC
3.000 BSC
2.703 BSC
1.500 BSC
0.000 BSC
-1.040 BSC
-1.500 BSC
3.000 REF
.311 .316 DIA THRU 14 HOLES
.010 DIA
6.75 TYP
.75 TYP
.38 TYP
45° TYP
.38 R TYP
.25 R TYP
6.12 TYP
5.12
.50 TYP
.25 TYP
.182 .162
.335
.06 R TYP
.184 .188 DIA THRU & CBORE NS .332 DIA X .010 DEEP 4 'M' HOLES
.014 D A
SEE NOTE 2.B.1.b.
.115 .105 TYP
4.905
.19 R 12 PLACES
M
11.00
10.355
5.966 5.946
0.000 BSC
CHAMFER .12 X 45° 8 PLACES
.940
1.490
.12 TYP
.315
8.269
8.584
8.946
.482 .462 TYP
.252 .244
.375 BSC
.362
.453 TYP
1.43 REF
1.440 BSC
1.770 BSC
0.000 BSC
1.926 1.922
4.094 BSC
7.844 BSC
10.168 BSC
10.498 BSC
11.563 BSC

REVISIONS						
SYM	ZONE	DESCRIPTION	BY	CHK	DATE	APPROVED
A		REPLACE REV- WITH CHANGE PER TDRR 24 277			11-23-65	



13.16
.184 .188 DIA THRU & CBORE .332 DIA X .095 .100 DEEP
2 "E" HOLES — (SEE NOTE 2.8.1.b FOR-001 ONLY)
⊕ .014 DIA
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
-A-
▱ A .005
11.129 11.121
10.596 10.576
23.182 23.162
3.000 REF
8.125 BSC
11.000 BSC
.50 TYP
1.91 9 PLACES
.97
.25 R 4 PLACES
.198 .178 R 4 PLACES
5.97
11.308 11.289
12.433
.50
.330 .310
32
.190
.100 TYP
1.50 TYP 2 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.252 .244
0.000BSC
DATUM LINES
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
19.750 BSC
21.031 BSC
24.250
.184 .188 DIA THRU & C BORE .332 DIA X .125 .130 DEEP
24 "A" HOLES — (SEE NOTE 2.8.1.b FOR -001 ONLY)
⊕ .014 DIA
.289 .294 DIA THRU
14 "B" HOLES
⊕ .008 DIA
.198 .200 DIA THRU
4 "C" HOLES — (SEE NOTE 2.8.1.b FOR-001 ONLY)
⊕ .006 DIA
A
B
C
E
A A
B B
(SEE NOTE 2.8.1.b FOR-001 ONLY) REF
.026 TYP
CHEMICAL BOND
.204 .194 R
.166 .151 TYP
.558 .538 DIA
.25 SPHERICAL R TYP
(SEE NOTE 2.8.1.b FOR -001 ONLY) REF
.026 TYP
.182 .167 TYP
CHEMICAL BOND

PARTIAL SECTION A–A
SCALE: NONE

PARTIAL SECTION B-B
SCALE: NONE

Ⓐ REPLACES REV– WITH CHANGE

REMARKS
... SHALL BE ... FREE OF ANODIZE.
... INDICATE ... PER
... NOT EPOXY COAT.
... REQUIRED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ±.005 .XX ±.01 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Tom Bell 23Feb65
CHECKED ... 23Feb65
APPROVED
APPROVED ... 23Feb65
APPROVED MIT ... 23Feb65
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE J
DRAWING NO. 1006379
SCALE 1/1
SHEET 1 OF 1

REQUIREMENTS:

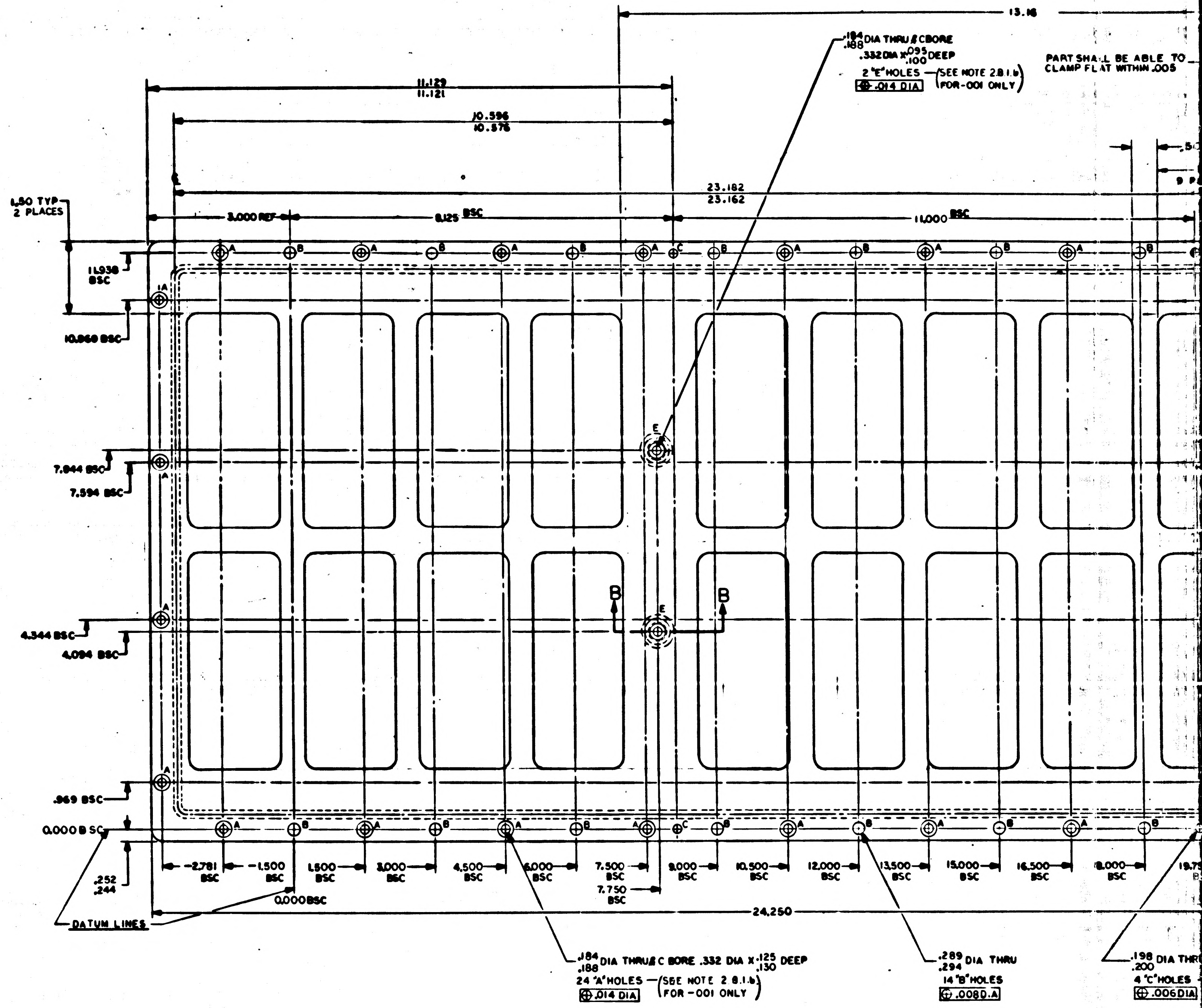
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4.

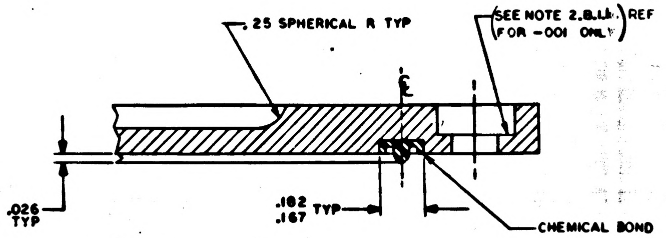
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: (a) SEE CHART
       (b) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN, 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PART NO.	MATERIAL	FINISH	REMARKS
1006379 — 001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	ANODIZE PER MIL-M-45202, TYPE I CLASS C.	SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER ND 1002040, DO NOT EPOXY COAT. ELECTRICAL BONDING REQUIRED
1006379 — 002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541 TYPE II GRADE C, CLASS 3	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.


13.16
.184 .188 DIA THRU & CBORE .332 DIA X .095 .100 DEEP
2 "E" HOLES
⊕ .014 DIA
(SEE NOTE 2.B.1.b FOR -001 ONLY)
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
11.129 11.121
10.596 10.576
23.182 23.162
1.50 TYP 2 PLACES
3.000 REF
8.125 BSC
11.000 BSC
9 P
11.938 BSC
10.860 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.252 .244
0.000 BSC
DATUM LINES
A
B
C
E
B
B
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
24.250
.184 .188 DIA THRU & C BORE .332 DIA X .125 .130 DEEP
24 "A" HOLES
⊕ .014 DIA
(SEE NOTE 2.B.1.b FOR -001 ONLY)
.289 .294 DIA THRU
14 "B" HOLES
⊕ .008 D.A
.198 .200 DIA THR
4 "C" HOLES
⊕ .006 DIA


.25 SPHERICAL R TYP
(SEE NOTE 2.B.1.b. FOR -001 ONLY) REF
℄
.026 TYP
.182 .167 TYP
CHEMICAL BOND

PARTIAL SECTION A–A

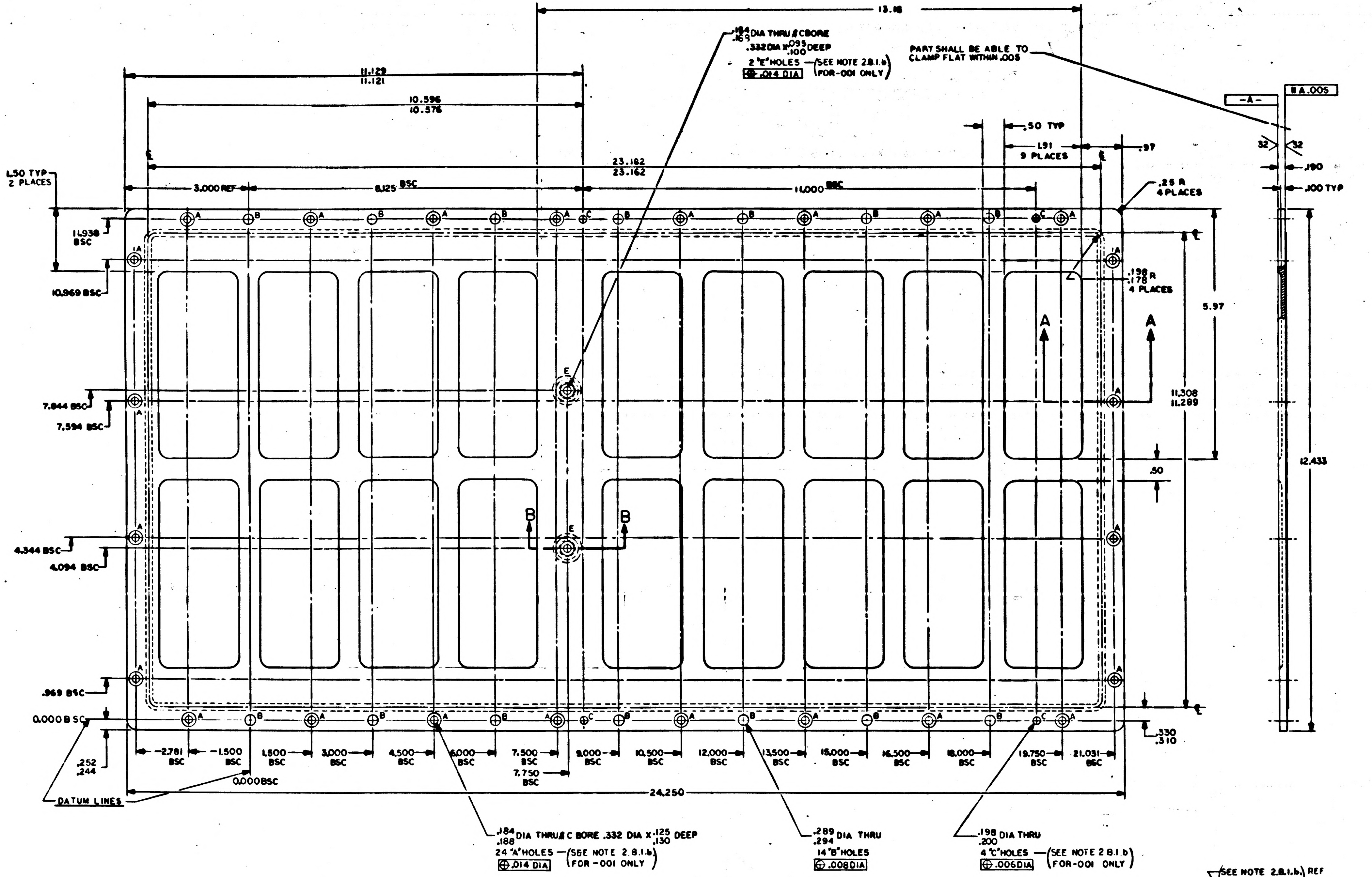
SCALE: NONE

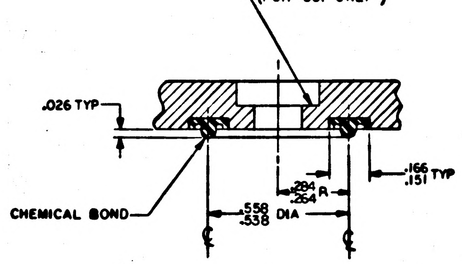
1006379 A

SYM	ZONE	DESCRIPTION	BY	CHK	DATE	APPROVED
A		REPLACE REV - WITH CHANGE PER TDRR 24277				
B		REVISED PER TDRR 25936				

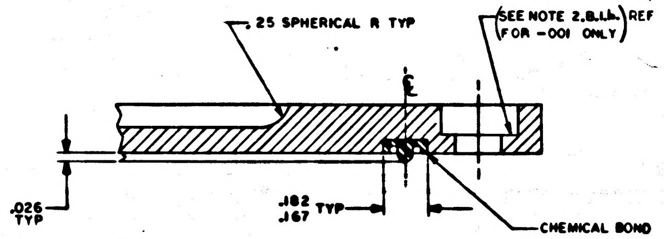
REMARKS

ACE SHALL BE FREE OF ANODIZE.
AT SURFACE INDICATED PER
DO NOT EPOXY COAT.
TRICAL BONDING REQUIRED


13.16
.184 .169 DIA THRU & CBORE .332 DIA X .095 .100 DEEP
2 "E" HOLES (SEE NOTE 2.8.1.b FOR -001 ONLY)
⊕ .014 DIA
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
-A-
∥ A .005
11.129
11.121
10.596
10.576
.50 TYP
1.91 9 PLACES
.97
32
32
.190
.100 TYP
23.182
23.162
1.50 TYP 2 PLACES
3.000 REF
8.125 BSC
11.000 BSC
.25 R 4 PLACES
11.938 BSC
10.969 BSC
.198 .178 R 4 PLACES
5.97
A
A
7.844 BSC
7.594 BSC
11.308
11.289
12.433
.50
B
B
E
E
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.330
.310
.252
.244
DATUM LINES
0.000 BSC
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
19.750 BSC
21.031 BSC
24.250
.184 .188 DIA THRU & C BORE .332 DIA X .125 .130 DEEP
24 "A" HOLES (SEE NOTE 2.8.1.b FOR -001 ONLY)
⊕ .014 DIA
.289 .294 DIA THRU
14 "B" HOLES
⊕ .008 DIA
.198 .200 DIA THRU
4 "C" HOLES (SEE NOTE 2.8.1.b FOR -001 ONLY)
⊕ .006 DIA


SEE NOTE 2.8.1.b REF FOR -001 ONLY
.026 TYP
CHEMICAL BOND
.284 .264 R
.558 .538 DIA
.166 .151 TYP

PARTIAL SECTION B-B
SCALE: NONE


.25 SPHERICAL R TYP
SEE NOTE 2.8.1.b REF FOR -001 ONLY
.026 TYP
.182 .167 TYP
CHEMICAL BOND

PARTIAL SECTION A-A
SCALE: NONE

Ⓐ REPLACES REV - WITH CHANGE

F-2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Tony Bell
CHECKED
APPROVED
APPROVED
APPROVED MIT
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006379

SCALE 1/1
SHEET 1 OF 1

1006379 B

REQUIREMENTS:

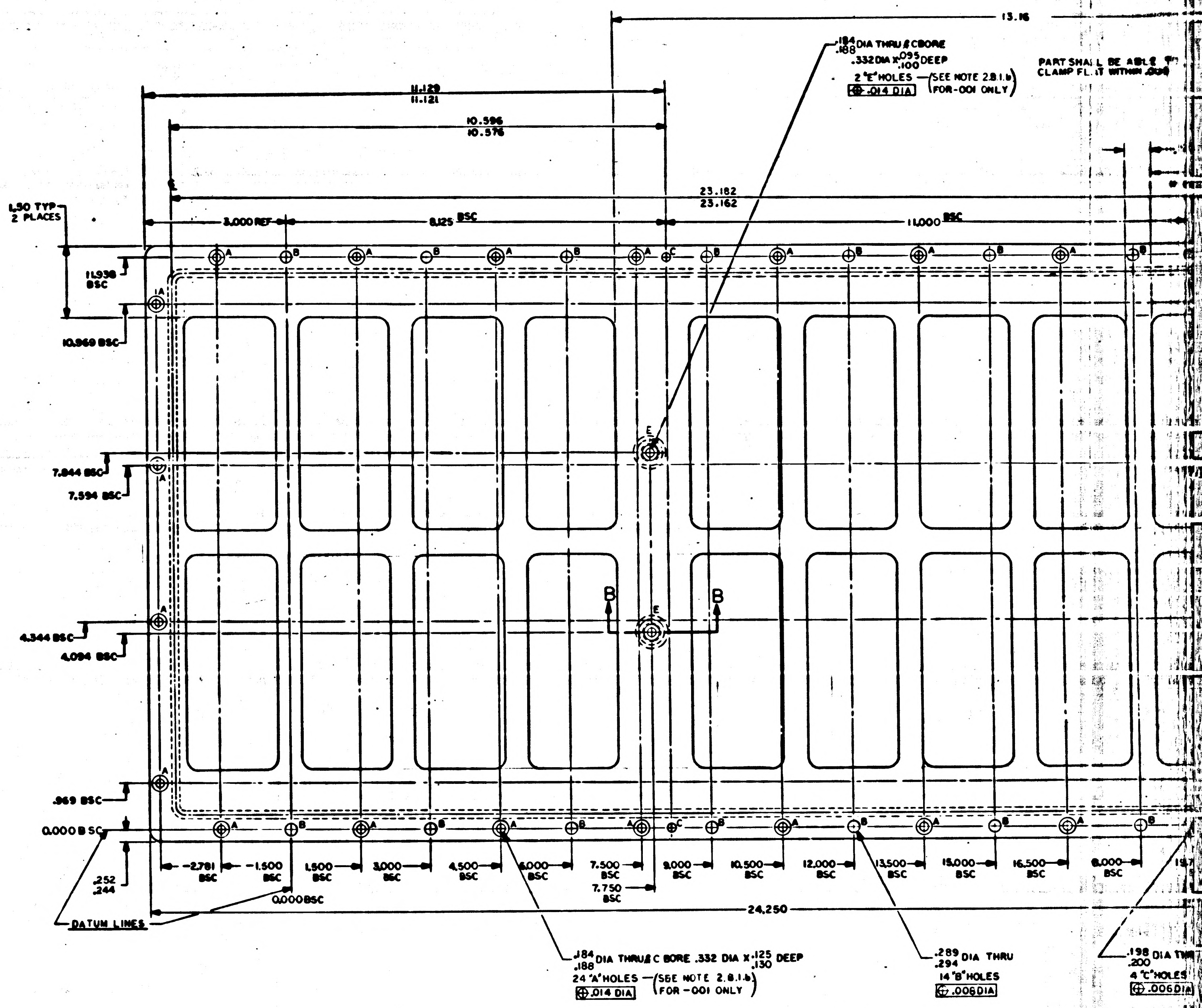
1. **GENERAL:**
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4.

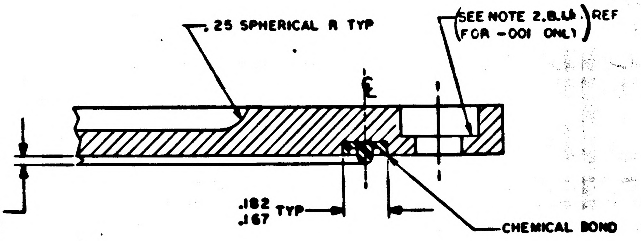
2. **INSPECTION AND ACCEPTANCE:**
   - A. MATERIAL:
     - (1) RETAINER: SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: (a) SEE CHART
       (b) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

3. **DESIGN:**
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN, 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PART NO.	MATERIAL	FINISH	REMARKS
1006379 — 001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	FINISH PER ______	SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER DO NOT EPOXY COAT. ELECTRICAL BONDING REQUIRED
1006379 — 002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541 TYPE II GRADE C, CLASS 3	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.


13.16
.184/.188 DIA THRU & CBORE .332 DIA X .095/.100 DEEP
2 "E" HOLES (SEE NOTE 2.B.1.b FOR -001 ONLY)
⊕ .014 DIA
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .030
11.129/11.121
10.596/10.576
23.182/23.162
1.50 TYP 2 PLACES
3.000 REF
8.125 BSC
11.000 BSC
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.252/.244
A
B
C
E
B B
-2.781 BSC
-1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
0.000 BSC
24.250
DATUM LINES
.184/.188 DIA THRU & C BORE .332 DIA X .125/.130 DEEP
24 "A" HOLES (SEE NOTE 2.B.1.b FOR -001 ONLY)
⊕ .014 DIA
.289/.294 DIA THRU
14 "B" HOLES
⊕ .006 DIA
.198/.200 DIA THRU
4 "C" HOLES
⊕ .006 DIA


.25 SPHERICAL R TYP
(SEE NOTE 2.B.1.b FOR -001 ONLY) REF
℄
.026 TYP
.182/.167 TYP
CHEMICAL BOND

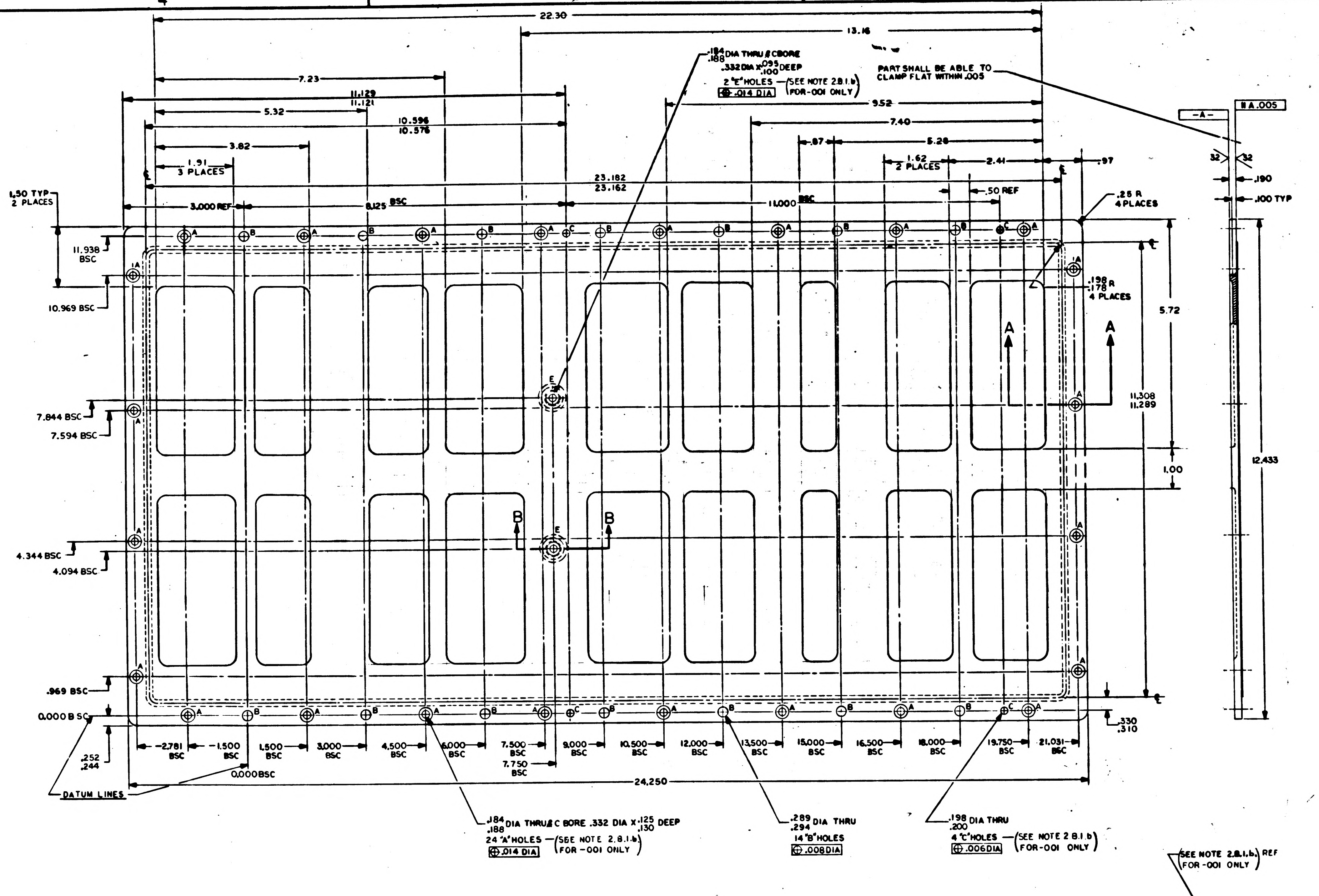
PARTIAL SECTION A—A

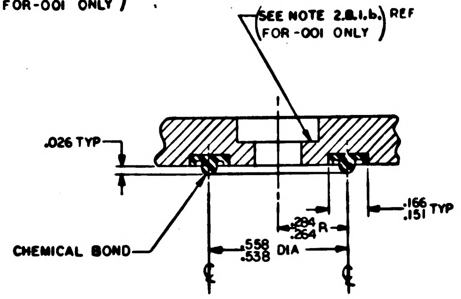
SCALE: NONE

F-1

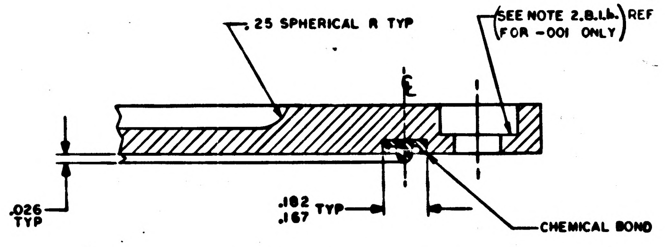
REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REPLACE REV - WITH CHANGE PER TDRR 24277				
B		REVISED PER TDRR 25936			2/15/66	
C		REVISED PER TDRR 27192				

REMARKS
FACE SHALL BE FREE OF ANODIZE.
AT SURFACE INDICATED PER
-M-3171 TYPE VI
CTRICAL BONDING REQUIRED


22.30
13.16
7.23
11.129
11.121
5.32
10.596
10.576
3.82
1.91
3 PLACES
9.52
7.40
.87
5.28
1.62
2 PLACES
2.41
.97
23.182
23.162
1.50 TYP
2 PLACES
3.000 REF
8.125 BSC
11.000 BSC
.50 REF
.25 R
4 PLACES
.184
.188 DIA THRU & C BORE
.332 DIA X .095 .100 DEEP
2 "E" HOLES — (SEE NOTE 2.8.1.b) (FOR -001 ONLY)
⊕ .014 DIA
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
-A-
∥ A .005
32
32
.190
.100 TYP
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.198
.178 R
4 PLACES
5.72
A
A
11.308
11.289
1.00
12.433
B
B
E
.330
.310
.252
.244
DATUM LINES
0.000 BSC
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
19.750 BSC
21.031 BSC
24.250
.184
.188 DIA THRU & C BORE .332 DIA X .125 .130 DEEP
24 "A" HOLES — (SEE NOTE 2.8.1.b) (FOR -001 ONLY)
⊕ .014 DIA
.289
.294 DIA THRU
14 "B" HOLES
⊕ .008 DIA
.198
.200 DIA THRU
4 "C" HOLES — (SEE NOTE 2.8.1.b) (FOR -001 ONLY)
⊕ .006 DIA


(SEE NOTE 2.8.1.b) REF
(FOR -001 ONLY)
.026 TYP
CHEMICAL BOND
.284
.264 R
.558
.538 DIA
.166
.151 TYP

PARTIAL SECTION B-B
SCALE: NONE


.25 SPHERICAL R TYP
(SEE NOTE 2.8.1.b) REF
(FOR -001 ONLY)
.026 TYP
.182
.167 TYP
CHEMICAL BOND

PARTIAL SECTION A-A
SCALE: NONE

Ⓐ REPLACES REV - WITH CHANGE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Tony Bal
CHECKED
APPROVED
APPROVED
APPROVED MIT
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006379

SCALE 1/1 SHEET 1 OF 1

REQUIREMENTS:

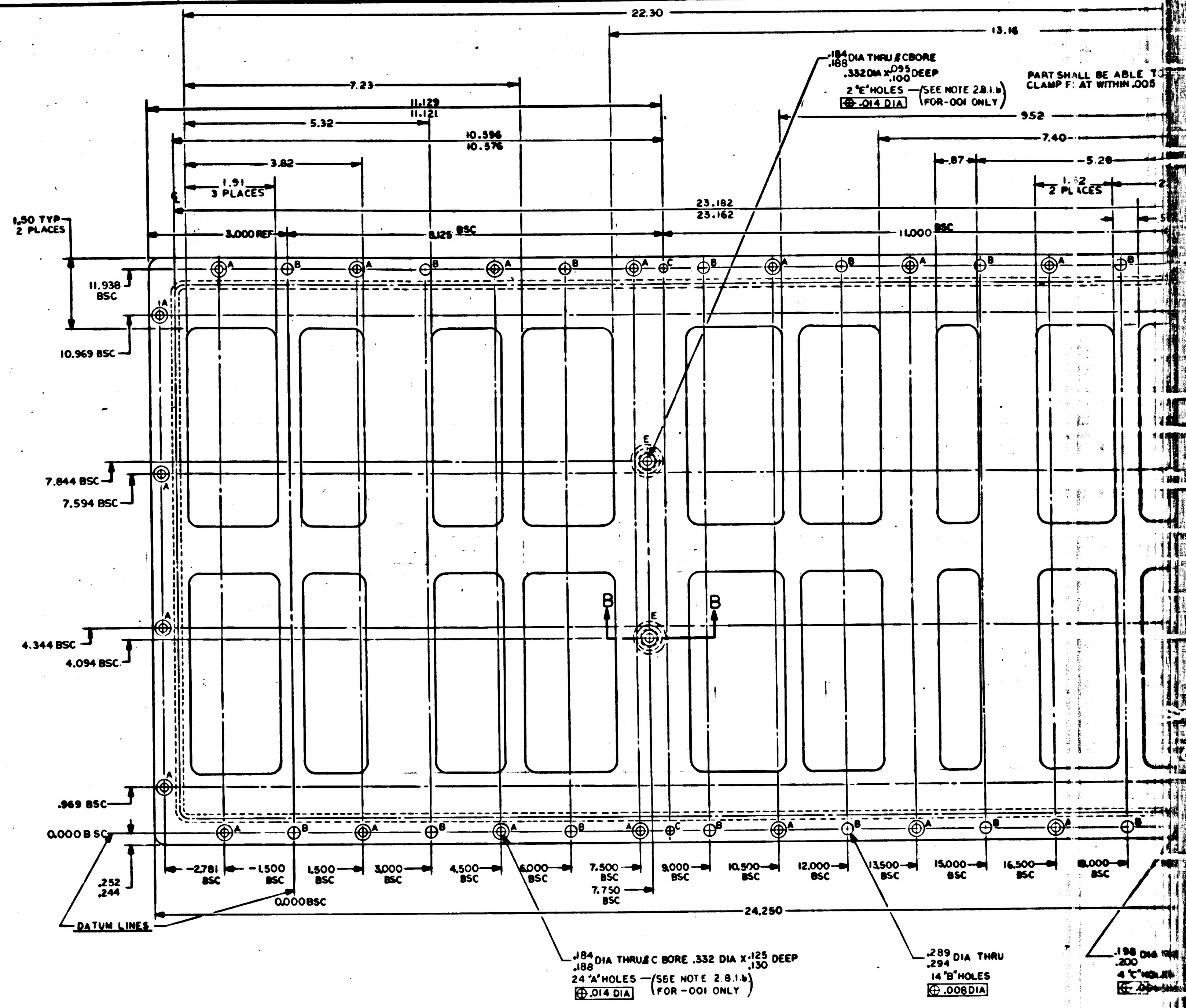
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4.

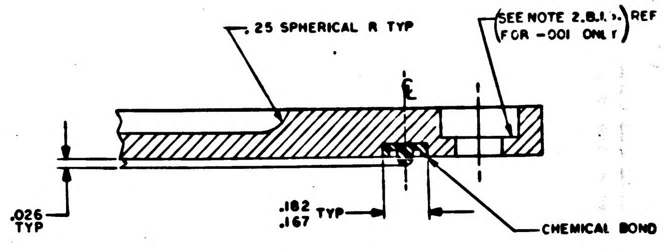
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: (a) SEE CHART
       (b) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN, 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PART NO.	MATERIAL	FINISH	REMARKS
1006379 —001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	ANODIZE PER MIL-M-45202 TYPE I CLASS C	SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER MIL-M-3171 TYPE VI ELECTRICAL BONDING REQUIRED
1006379 —002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541 TYPE II GRADE C, CLASS 3	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

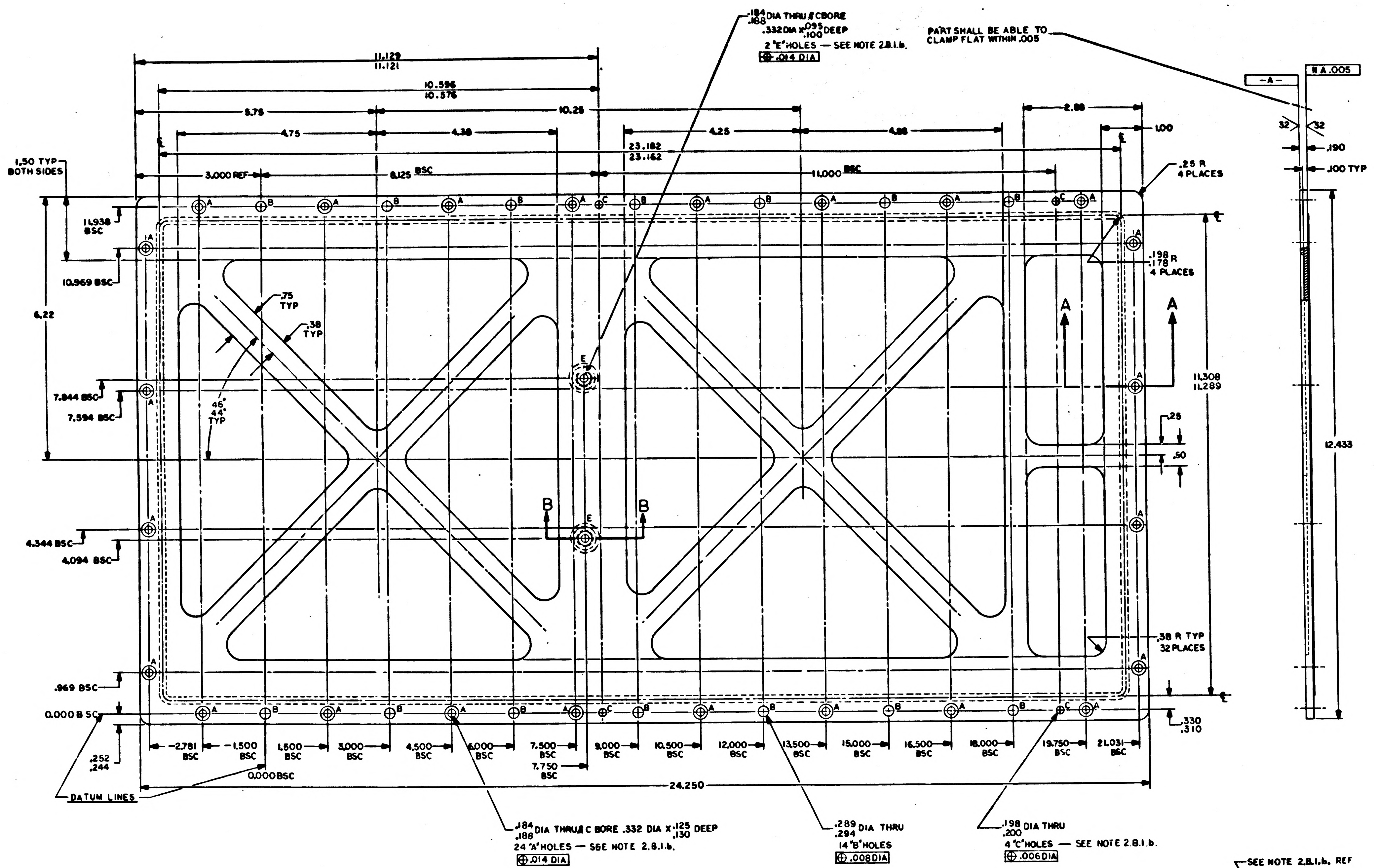

22.30
13.16
7.23
11.129
11.121
5.32
10.596
10.576
3.82
1.91
3 PLACES
23.182
23.162
1.50 TYP
2 PLACES
3.000 REF
8.125 BSC
11.000 BSC
.184
.188 DIA THRU & CBORE
.332 DIA X .095
.100 DEEP
2 "E" HOLES
⊕ .014 DIA
(SEE NOTE 2.B.1.b)
(FOR -001 ONLY)
PART SHALL BE ABLE TO
CLAMP FLAT WITHIN .005
9.52
7.40
.87
5.28
2 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.252
.244
A
B
C
E
-2.781 BSC
-1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
0.000 BSC
24.250
DATUM LINES
.184
.188 DIA THRU & C BORE .332 DIA X .125
.130 DEEP
24 "A" HOLES
⊕ .014 DIA
(SEE NOTE 2.B.1.b)
(FOR -001 ONLY)
.289
.294 DIA THRU
14 "B" HOLES
⊕ .008 DIA
.198
.200 DIA
4 "C" HOLES


.25 SPHERICAL R TYP
(SEE NOTE 2.B.1.b) REF
(FOR -001 ONLY)
℄
.026
TYP
.182
.167 TYP
CHEMICAL BOND

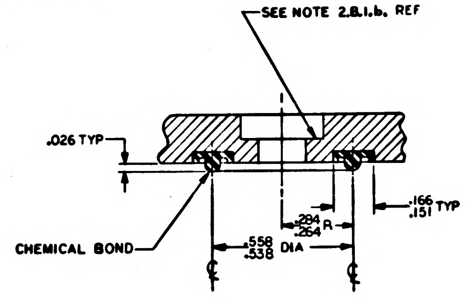
PARTIAL SECTION A—A

SCALE: NONE

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 23084	LAL		10/7/65	

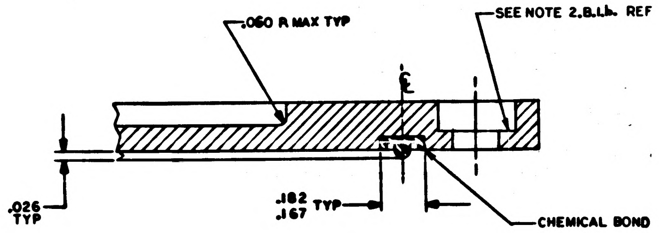


.184 / .188 DIA THRU & CBORE .332 DIA X .095 / .100 DEEP
2 "E" HOLES — SEE NOTE 2.B.1.b.
⊕ .014 DIA
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
-A-
// A .005
11.129 / 11.121
10.596 / 10.576
5.75
10.25
4.75
4.38
4.25
4.88
2.88
1.00
23.182 / 23.162
1.50 TYP BOTH SIDES
3.000 REF
8.125 BSC
11.000 BSC
.25 R 4 PLACES
.198 / .178 R 4 PLACES
32
.190
.100 TYP
11.938 BSC
10.969 BSC
6.22
.75 TYP
.38 TYP
46° / 44° TYP
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.252 / .244
0.000 BSC
DATUM LINES
11.308 / 11.289
12.433
.25
.50
.38 R TYP 32 PLACES
.330 / .310
A
B
C
E
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
19.750 BSC
21.031 BSC
24.250
.184 / .188 DIA THRU & C BORE .332 DIA X .125 / .130 DEEP
24 "A" HOLES — SEE NOTE 2.B.1.b.
⊕ .014 DIA
.289 / .294 DIA THRU
14 "B" HOLES
⊕ .008 DIA
.198 / .200 DIA THRU
4 "C" HOLES — SEE NOTE 2.B.1.b.
⊕ .006 DIA



SEE NOTE 2.B.1.b. REF
.026 TYP
CHEMICAL BOND
.558 / .538 DIA
.294 / .264 R
.166 / .151 TYP
℄

PARTIAL SECTION B-B
SCALE: NONE



.060 R MAX TYP
SEE NOTE 2.B.1.b. REF
℄
.026 TYP
.182 / .167 TYP
CHEMICAL BOND

PARTIAL SECTION A-A
SCALE: NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN L. Bl... 23 Sept 65
CHECKED R. Hong 10/7/65
APPROVED 10/7/65
APPROVED 5 Oct 65
APPROVED MIT 10/6/65
APPROVED NASA NOT REQUIRED PER LETTER PP7-65-612
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006379

SCALE 1/1 SHEET 1 OF 1

MASTER

1006379 —

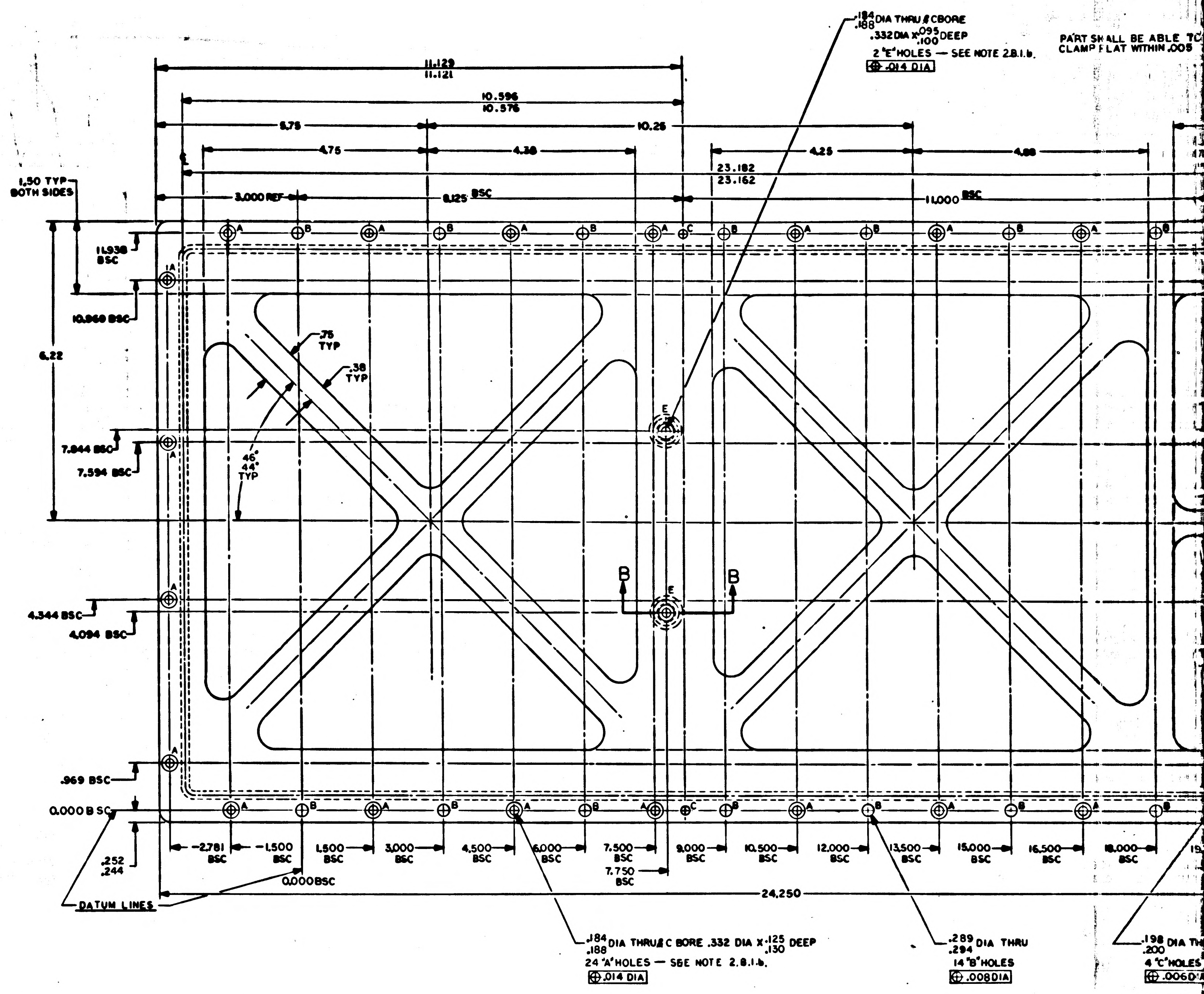
REQUIREMENTS:

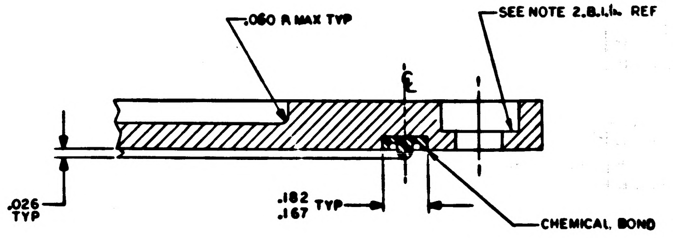
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: MAGNESIUM/HK31A-H24 PER MIL-M-26075.
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: (a) ANODIZE PER MIL-M-45202, TYPE I, CLASS C.
       - (b) SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER ND1002040. DO NOT EPOXY COAT, ELECTRICAL BONDING REQUIRED.
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN, 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

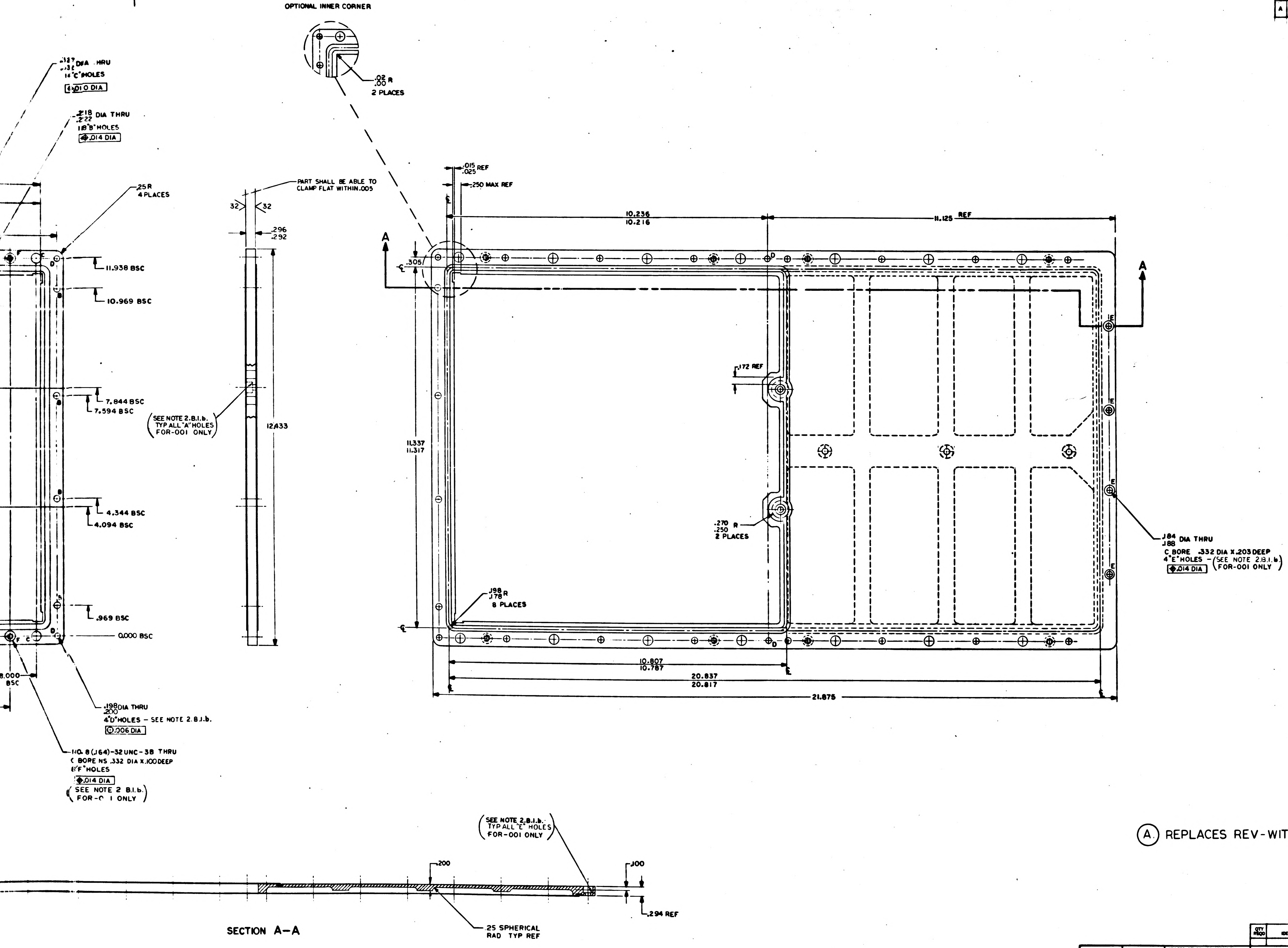

.184 .188 DIA THRU & CBORE .332 DIA X .095 .100 DEEP
2 "E" HOLES — SEE NOTE 2.B.1.b.
⊕ .014 DIA
PART SHALL BE ABLE TO
CLAMP FLAT WITHIN .005
11.129 11.121
10.596 10.576
5.75
10.25
4.75
4.38
4.25
4.88
23.182 23.162
1.50 TYP BOTH SIDES
3.000 REF
8.125 BSC
11.000 BSC
11.938 BSC
10.969 BSC
6.22
.75 TYP
.38 TYP
46° 44° TYP
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.252 .244
DATUM LINES
-2.781 BSC
-1.500 BSC
0.000 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
24.250
B
B
E
A
B
C
.184 .188 DIA THRU & C BORE .332 DIA X .125 .130 DEEP
24 "A" HOLES — SEE NOTE 2.B.1.b.
⊕ .014 DIA
.289 .294 DIA THRU
14 "B" HOLES
⊕ .008 DIA
.198 .200 DIA TH
4 "C" HOLES
⊕ .006 D


.060 R MAX TYP
SEE NOTE 2.B.1.b. REF
℄
.026 TYP
.182 .167 TYP
CHEMICAL BOND

PARTIAL SECTION A–A

SCALE: NONE

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277			1-25-66	


OPTIONAL INNER CORNER
.02 .00 R 2 PLACES
.127 .132 DIA THRU 14 "C" HOLES
.010 DIA
.218 .222 DIA THRU 18 "B" HOLES
.014 DIA
.25 R 4 PLACES
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296 .292
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
(SEE NOTE 2.B.1.b. TYP ALL "A" HOLES FOR-001 ONLY)
12.433
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
8.000 BSC
.198 .200 DIA THRU 4 "D" HOLES - SEE NOTE 2.B.1.b.
.006 DIA
NO. 8 (.164)-32 UNC-3B THRU C BORE NS .332 DIA X .100 DEEP 8 "F" HOLES
.014 DIA
(SEE NOTE 2 B.1.b. FOR-001 ONLY)
.015 .025 REF
.250 MAX REF
10.236 10.216
11.125 REF
A
.305
A
.172 REF
11.337 11.317
.270 .250 R 2 PLACES
.198 .178 R 8 PLACES
.184 .188 DIA THRU C BORE .332 DIA X .203 DEEP 4 "E" HOLES - (SEE NOTE 2.B.1.b. FOR-001 ONLY)
.014 DIA
10.807 10.787
20.837 20.817
21.875
(SEE NOTE 2.B.1.b. TYP ALL "E" HOLES FOR-001 ONLY)
.200
.100
.294 REF
.25 SPHERICAL RAD TYP REF
SECTION A-A

Ⓐ REPLACES REV-WITH CHANGE

3H

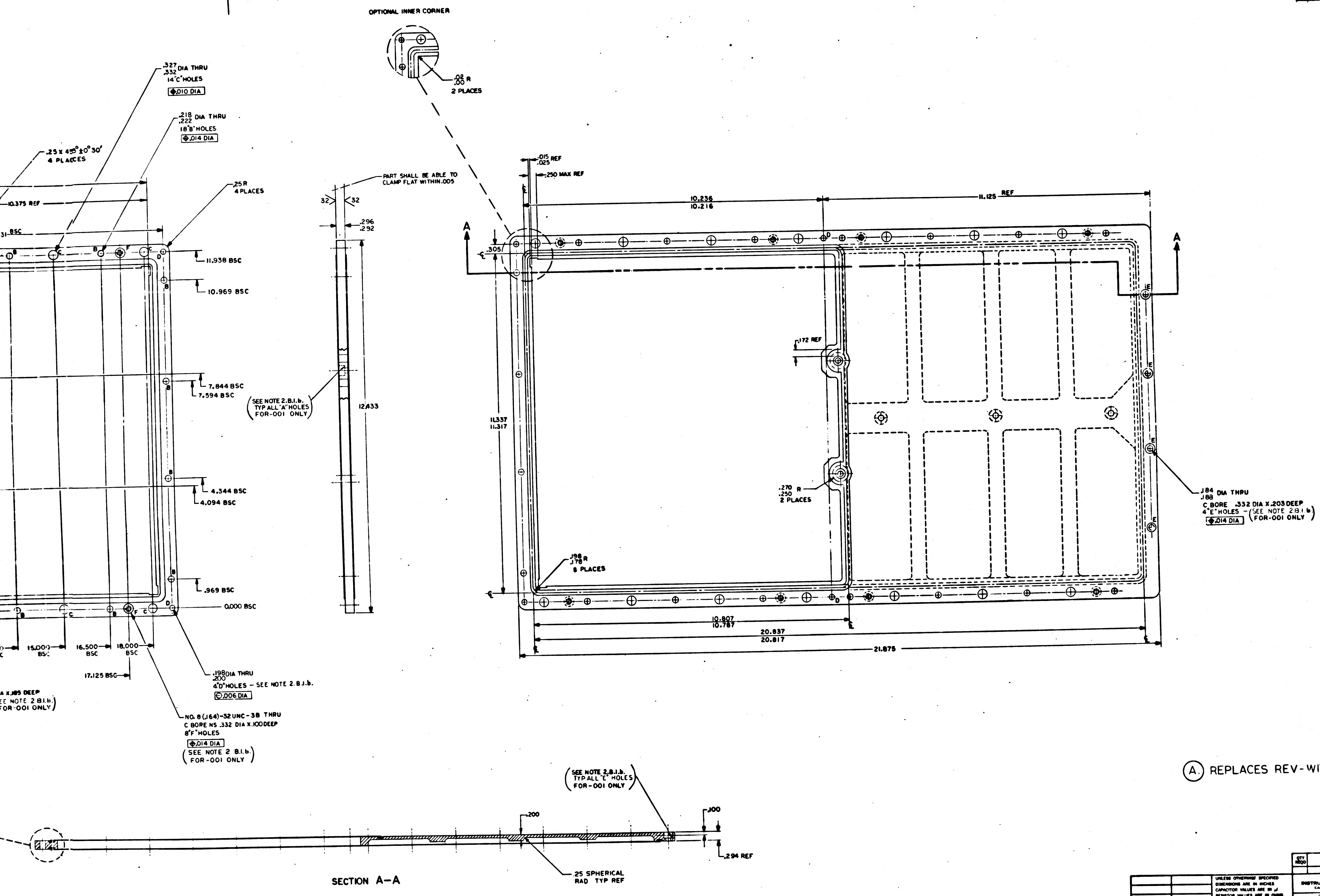
			QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
				LIST OF MATERIALS		
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES CAPACITOR VALUES ARE IN μf RESISTOR VALUES ARE IN OHMS TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — .XXX ± .005 .XX ± .01 ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
			DRAWN Bonarrigo CHECKED APPROVED APPROVED		GASKET, RETAINED SPECIFICATION CONTROL DRAWING	
NEXT ASSY	USED ON	MATERIAL SEE REQUIREMENTS	MSC A. C. METZGER 23 Nov 65	CODE IDENT NO. 80230	SIZE J	DRAWING NO. 1006381
APPLICATION				DATE	SCALE 1/1	SHEET 1 OF 1

1006381 A

MASTER

F3

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277				



OPTIONAL INNER CORNER
.02 .00 R 2 PLACES
.327 .332 DIA THRU 14 "C" HOLES ⌖.010 DIA
.218 .222 DIA THRU 18 "B" HOLES ⌖.014 DIA
.25 X 45° ±0° 30' 4 PLACES
.25 R 4 PLACES
10.375 REF
BSC
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
15.000 BSC
16.500 BSC
18.000 BSC
17.125 BSC
.198 .200 DIA THRU 4 "D" HOLES - SEE NOTE 2.B.1.b. ⌖.006 DIA
NO. 8 (.164)-32 UNC-3B THRU C BORE NS .332 DIA X .100 DEEP 8 "F" HOLES ⌖.014 DIA (SEE NOTE 2 B.1.b. FOR-001 ONLY)
A X.185 DEEP
EE NOTE 2 B.1.b.
FOR-001 ONLY
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296 .292
12.433
(SEE NOTE 2.B.1.b. TYP ALL "A" HOLES FOR-001 ONLY)
.015 .025 REF
.250 MAX REF
10.236 10.216
11.125 REF
A
A
.305
.172 REF
11.337 11.317
.270 .250 R 2 PLACES
.198 .178 R 8 PLACES
.184 .188 DIA THRU C BORE .332 DIA X .203 DEEP 4 "E" HOLES - (SEE NOTE 2.B.1.b. FOR-001 ONLY) ⌖.014 DIA
10.807 10.787
20.837 20.817
21.875
(SEE NOTE 2.B.1.b. TYP ALL "E" HOLES FOR-001 ONLY)
.200
.100
.294 REF
.25 SPHERICAL RAD TYP REF
SECTION A-A

Ⓐ REPLACES REV - WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN Bonarrigo
CHECKED
APPROVED
APPROVED
MSC A.E. METZGER
WKupfer 23 Nov 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006381

SCALE 1/1 SHEET 1 OF 1

MASTER

1006381	A

F2

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4

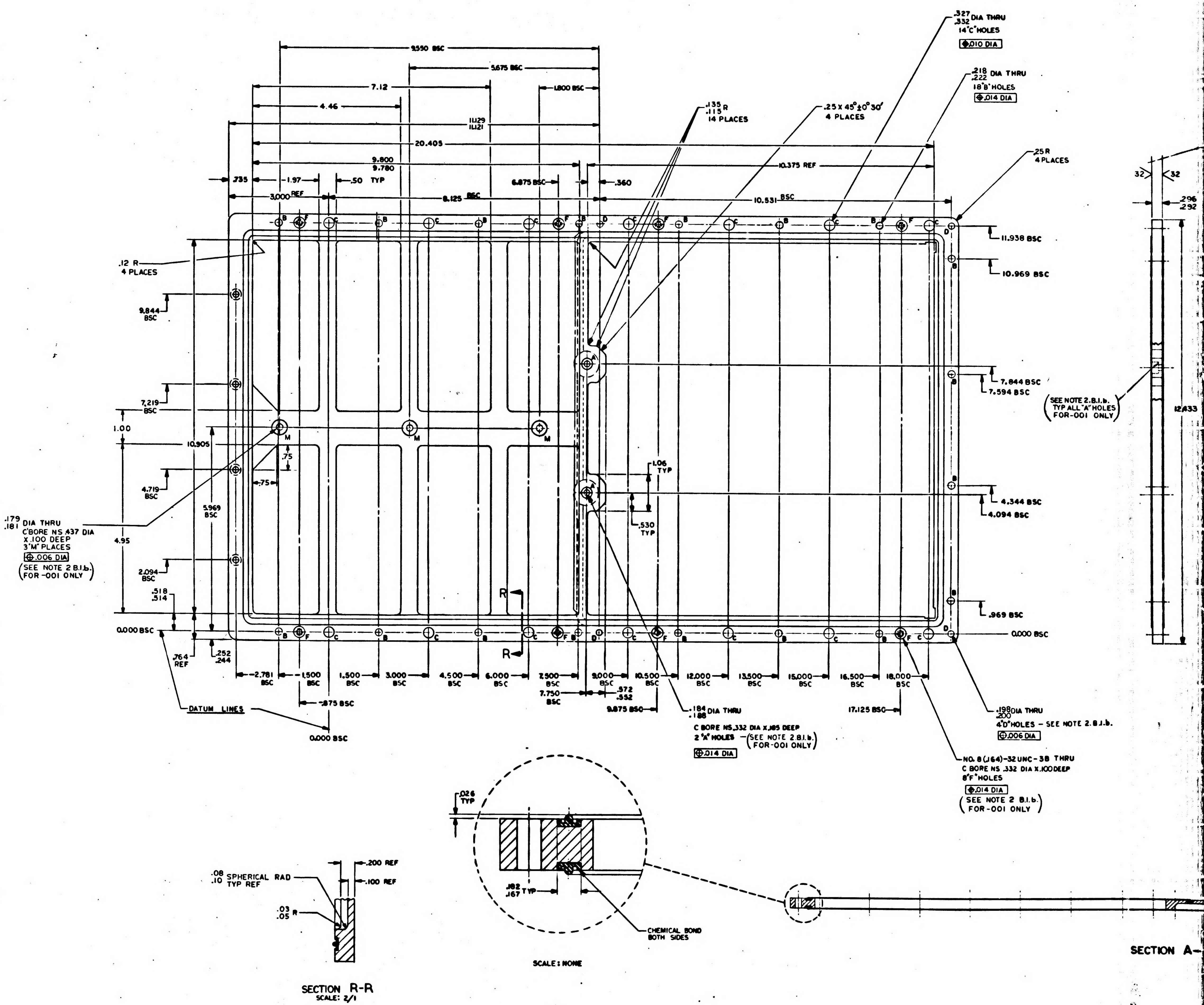
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: a) SEE CHART
       b) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. ALL INSIDE RADII TO BE .25 SPHERICAL UNLESS OTHERWISE SPECIFIED
   - F. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PART NO.	MATERIAL	FINISH	REMARKS
1006381-001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	ANODIZE PER MIL-M-45202 TYPE I CLASS C	SURFACE & TAPPED HOLES SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER ND1002040. DO NOT EPOXY COAT. ELECTRICAL BONDING REQUIRED
1006381-002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541 TYPE II GRADE C CLASS 3	

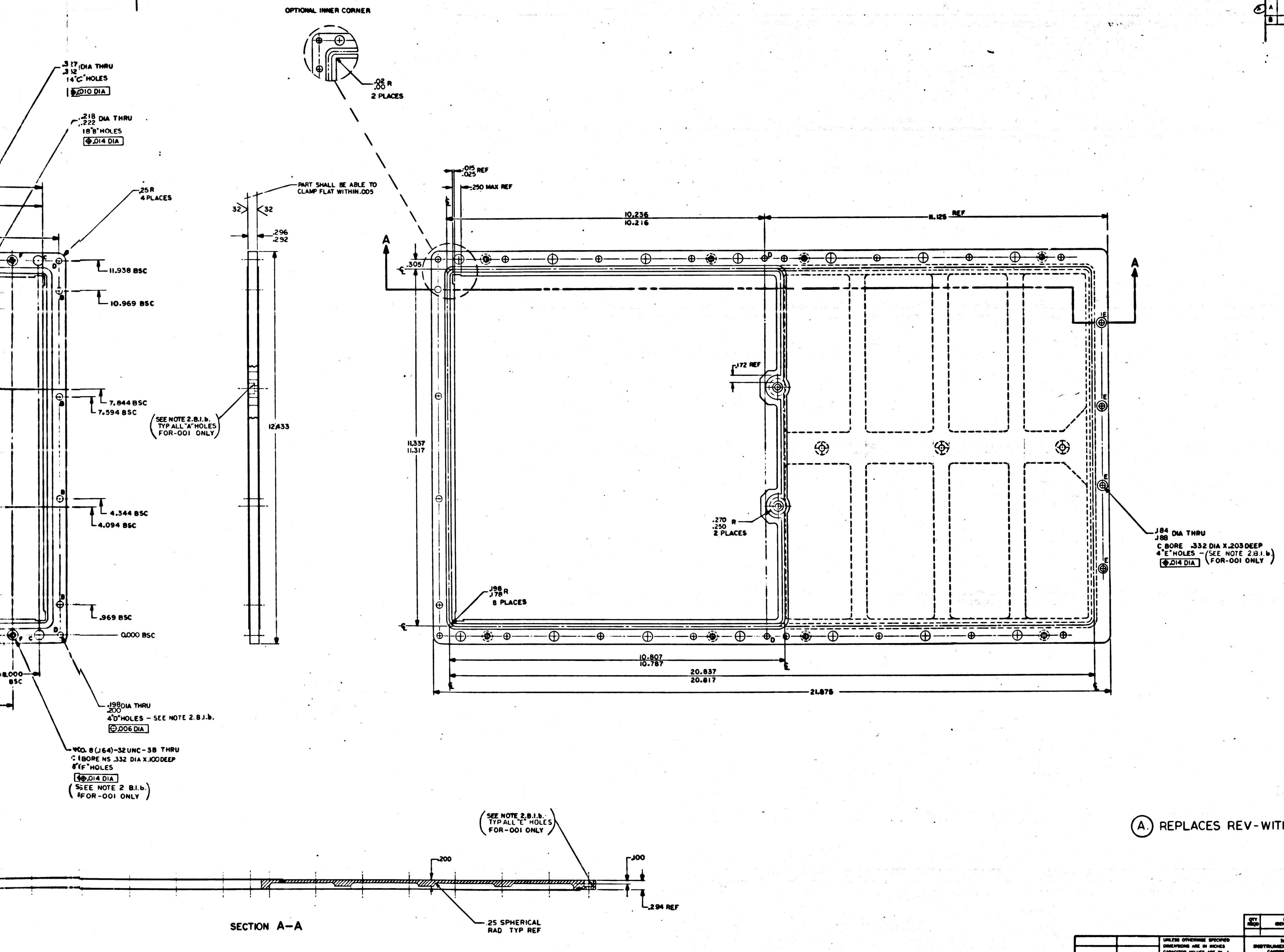
PROCURE ONLY FROM APPROVED SOURCES LIST ON ND1002034 FOR THIS DRAWING.

3H


9.550 BSC
5.675 BSC
7.12
1.800 BSC
4.46
11.129
11.121
20.405
9.800
9.780
10.375 REF
.735
1.97
.50 TYP
6.875 BSC
.360
3.000 REF
8.125 BSC
10.531 BSC
.135
.115 R
14 PLACES
.25 X 45° ±0° 30′
4 PLACES
.327
.332 DIA THRU
14 "C" HOLES
⊕ .010 DIA
.218
.222 DIA THRU
18 "B" HOLES
⊕ .014 DIA
.25 R
4 PLACES
32
32
.296
.292
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
SEE NOTE 2.B.I.b.
TYP ALL "A" HOLES
FOR -001 ONLY
12.433
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.12 R
4 PLACES
9.844 BSC
7.219 BSC
1.00
10.905
.75
.75
4.719 BSC
5.969 BSC
4.95
2.094 BSC
.518
.514
0.000 BSC
.764 REF
.252
.244
1.06 TYP
.530 TYP
.179
.181 DIA THRU
C'BORE NS .437 DIA
X .100 DEEP
3 "M" PLACES
⊕ .006 DIA
(SEE NOTE 2 B.I.b.
FOR -001 ONLY)
R
R
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
.875 BSC
.572
.552
9.875 BSC
17.125 BSC
DATUM LINES
0.000 BSC
.184
.188 DIA THRU
C BORE NS .332 DIA X .185 DEEP
2 "A" HOLES – (SEE NOTE 2.B.I.b.
FOR -001 ONLY)
⊕ .014 DIA
.198
.200 DIA THRU
4 "D" HOLES – SEE NOTE 2.B.I.b.
⊕ .006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
⊕ .014 DIA
(SEE NOTE 2 B.I.b.
FOR -001 ONLY)
A B C D F M
.026 TYP
.182
.167 TYP
CHEMICAL BOND
BOTH SIDES
SCALE: NONE
.08
.10 SPHERICAL RAD
TYP REF
.200 REF
.100 REF
.03
.05 R
SECTION R-R
SCALE: 2/1
SECTION A-

1006381	A

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277			[illegible]-25-[illegible]	WK
B		REVISED PER TDRR 25936				


4
3
2
1
D
C
B
A
OPTIONAL INNER CORNER
.02 R
.00
2 PLACES
.317 DIA THRU
.312
14 "C" HOLES
.010 DIA
.218 DIA THRU
.222
18 "B" HOLES
.014 DIA
.25 R
4 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
8.000 BSC
(SEE NOTE 2.B.I.b. TYP ALL "A" HOLES FOR-001 ONLY)
.198 DIA THRU
.200
4 "D" HOLES - SEE NOTE 2.B.I.b.
.006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
.014 DIA
(SEE NOTE 2 B.I.b. FOR-001 ONLY)
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296
.292
12.433
.015 REF
.025
.250 MAX REF
10.236
10.216
11.125 REF
A
A
.305
11.337
11.317
.172 REF
.270 R
.250
2 PLACES
.198 R
.178
8 PLACES
10.807
10.787
20.837
20.817
21.875
.184 DIA THRU
.188
C BORE .332 DIA X .203 DEEP
4 "E" HOLES - (SEE NOTE 2.B.I.b FOR-001 ONLY)
.014 DIA
(SEE NOTE 2.B.I.b. TYP ALL "E" HOLES FOR-001 ONLY)
.200
.100
.294 REF
.25 SPHERICAL RAD TYP REF
SECTION A-A

Ⓐ REPLACES REV-WITH CHANGE

F-3

MASTER

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — .XXX ± .005 ±
.XX ± .01
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN Bonarrigo
CHECKED [illegible]
APPROVED
APPROVED [illegible]
MSC A.C. METZGER
WKupfer 23 Nov 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

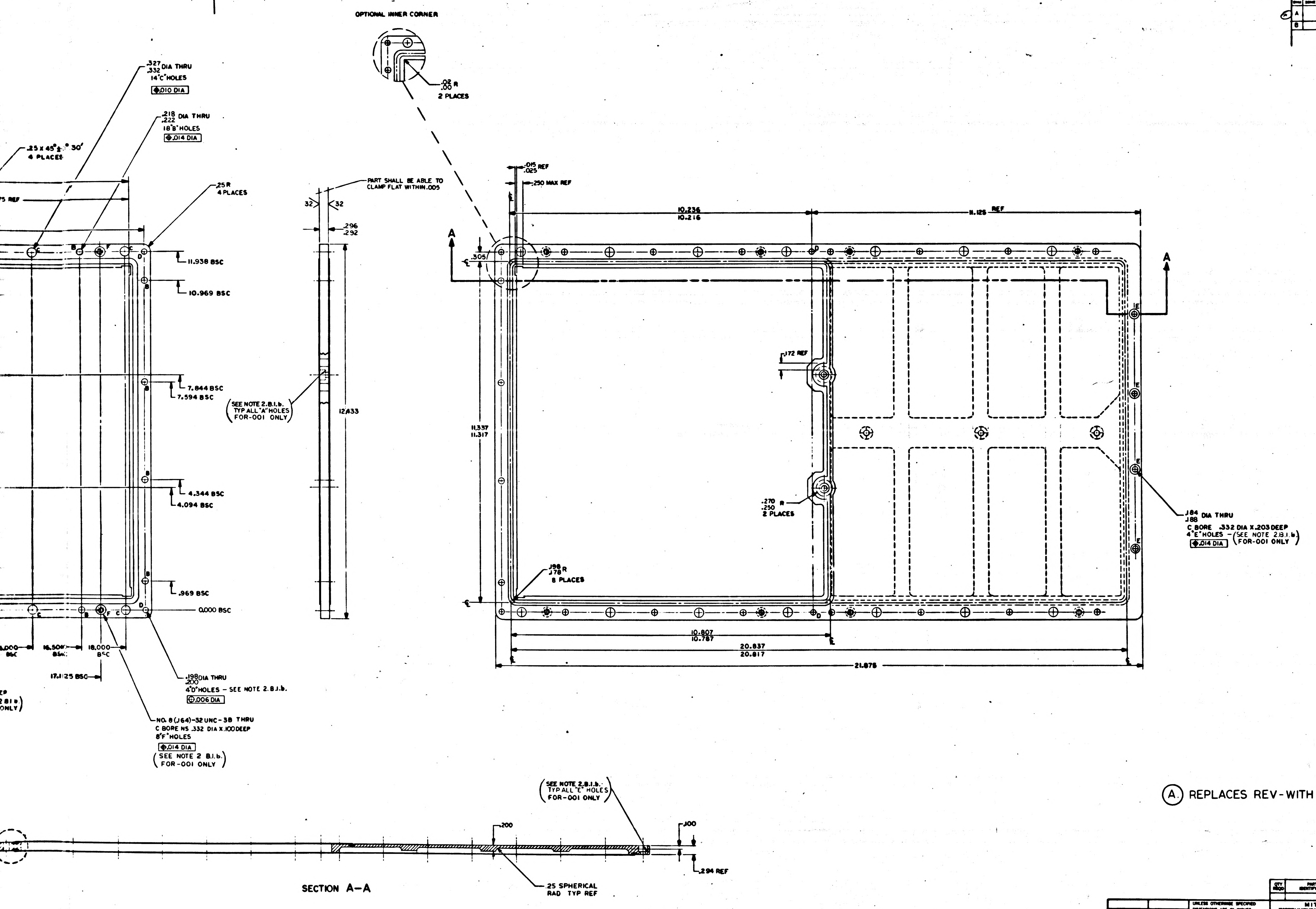
GASKET, RETAINED,
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	J	1006381

SCALE 1/1 SHEET 1 OF 1

1006381 B

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
Ⓐ A		REPLACES REV - WITH CHANGE PER TDRR 2427?				
B		REVISED PER TDRR 25936				



OPTIONAL INNER CORNER
.02 .00 R 2 PLACES
.327 .332 DIA THRU 14 "C" HOLES ⌖.010 DIA
.218 .222 DIA THRU 18 "B" HOLES ⌖.014 DIA
.25 x 45° ± 30' 4 PLACES
.25 R 4 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
16.500 BSC
18.000 BSC
17.1125 BSC
.198 .200 DIA THRU 4 "D" HOLES - SEE NOTE 2.B.J.b. ⌖.006 DIA
NO. 8 (.164)-32 UNC-3B THRU C BORE NS .332 DIA X .100 DEEP 8 "F" HOLES ⌖.014 DIA (SEE NOTE 2 B.I.b. FOR-001 ONLY)
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
.296 .292
12.433
(SEE NOTE 2.B.I.b. TYP ALL "A" HOLES FOR-001 ONLY)
.015 .025 REF
.250 MAX REF
10.236 10.216
11.125 REF
.305
A
.172 REF
11.337 11.317
.270 .250 R 2 PLACES
.198 .178 R 8 PLACES
.184 .188 DIA THRU C BORE .332 DIA X .203 DEEP 4 "E" HOLES - (SEE NOTE 2.B.I.b FOR-001 ONLY) ⌖.014 DIA
10.807 10.787
20.837 20.817
21.875
(SEE NOTE 2.B.I.b. TYP ALL "E" HOLES FOR-001 ONLY)
.200
.100
.25 SPHERICAL RAD TYP REF
.294 REF
SECTION A-A

Ⓐ REPLACES REV-WITH CHANGE

E2

MASTER

1006381 B

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .005 .XX ± .01 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN Bonarrigo
CHECKED
APPROVED
APPROVED
MSC A. C. METZGER
WKupfer 23 Nov 65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

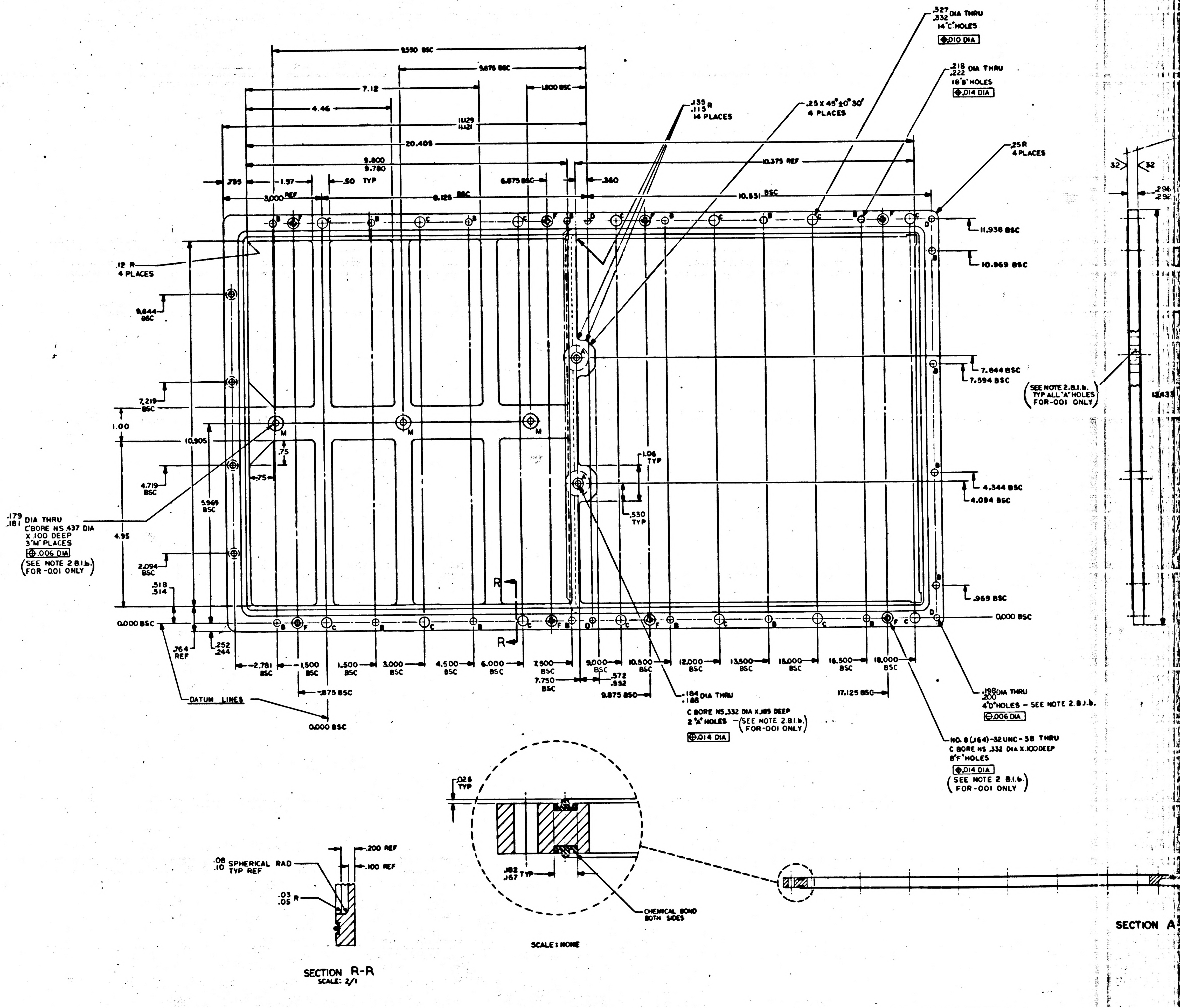
CODE IDENT NO. 80230
SIZE J
DRAWING NO. 1006381
SCALE 1/1
SHEET 1 OF 1

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: a) SEE CHART
       - b) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125✓ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. ALL INSIDE RADII TO BE .25 SPHERICAL UNLESS OTHERWISE SPECIFIED
   - F. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER
3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PART NO.	MATERIAL	FINISH	REMARKS
1006381-001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	FINISH PER _____	SURFACE & TAPPED HOLES SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER DO NOT EPOXY COAT. ELECTRICAL BONDING REQUIRED
1006381-002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541 TYPE II GRADE C CLASS 3	

PROCURE ONLY FROM APPROVED SOURCES LIST ON ND1002034 FOR THIS DRAWING.

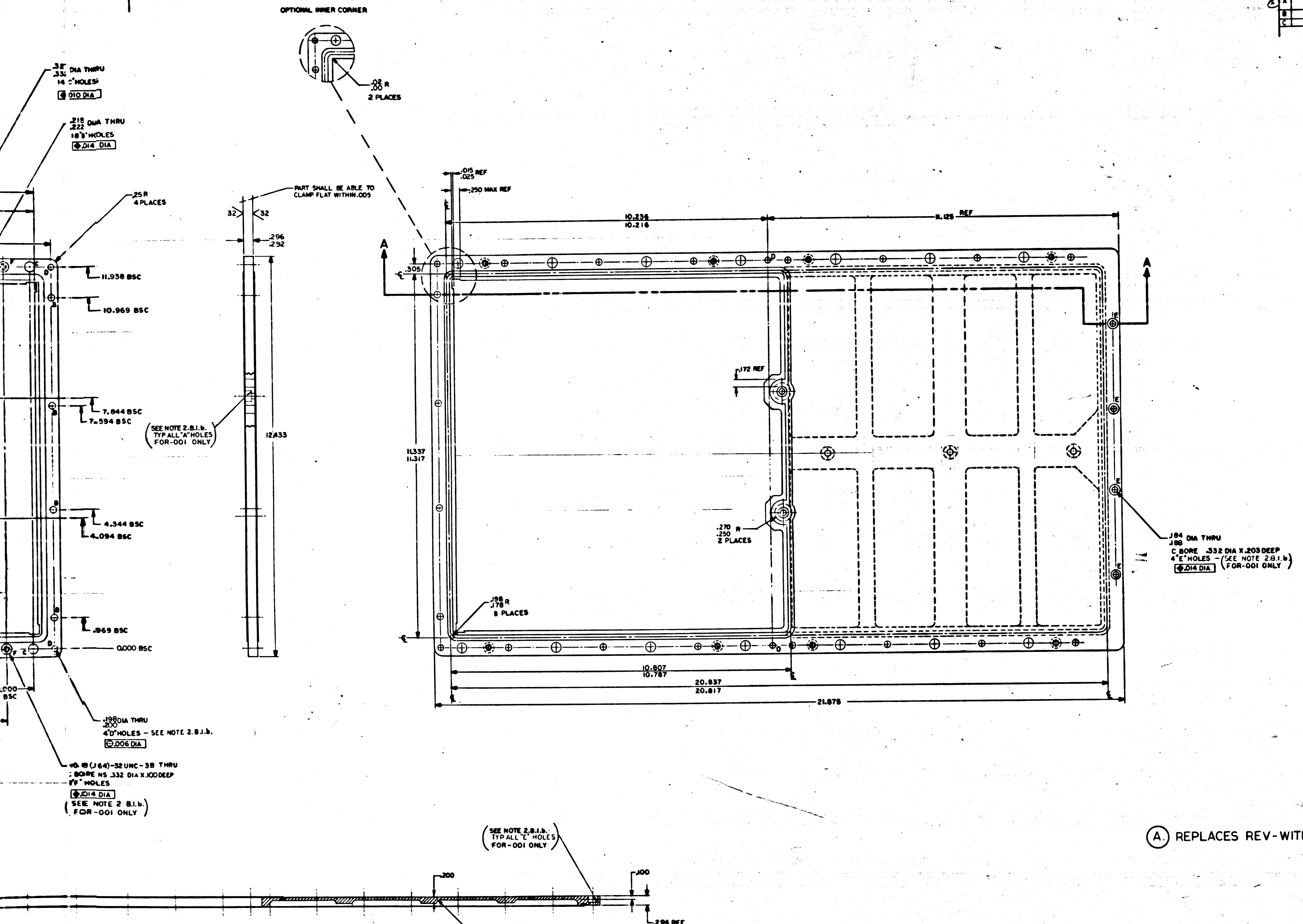

9.550 BSC
5.675 BSC
7.12
1.800 BSC
4.46
11.129
11.121
20.405
9.800
9.780
10.375 REF
.735
1.97
.50 TYP
6.875 BSC
.360
3.000 REF
8.125 BSC
10.531 BSC
.135
.115 R
14 PLACES
.25 X 45° ±0° 30'
4 PLACES
.327
.332 DIA THRU
14 "C" HOLES
⌖.010 DIA
.218
.222 DIA THRU
18 "B" HOLES
⌖.014 DIA
.25 R
4 PLACES
32
32
.296
.292
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
(SEE NOTE 2.B.1.b. TYP ALL "A" HOLES FOR-001 ONLY)
12.435
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.12 R
4 PLACES
9.844 BSC
7.219 BSC
1.00
10.905
.75
.75
4.719 BSC
5.969 BSC
4.95
2.094 BSC
.518
.514
0.000 BSC
.764 REF
.252
.244
.179
.181 DIA THRU
C'BORE NS .437 DIA
X .100 DEEP
3 "M" PLACES
⌖.006 DIA
(SEE NOTE 2 B.1.b. FOR -001 ONLY)
1.06 TYP
.530 TYP
M
M
M
A
A
B
C
D
F
R
R
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
.572
.552
9.875 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
17.125 BSC
18.000 BSC
.875 BSC
DATUM LINES
0.000 BSC
.184
.188 DIA THRU
C BORE NS .332 DIA X .185 DEEP
2 "A" HOLES – (SEE NOTE 2.B.1.b. FOR-001 ONLY)
⌖.014 DIA
.198
.200 DIA THRU
4 "D" HOLES – SEE NOTE 2.B.1.b.
⌖.006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
⌖.014 DIA
(SEE NOTE 2 B.1.b. FOR -001 ONLY)
.08
.10 SPHERICAL RAD TYP REF
.03
.05 R
.200 REF
.100 REF
SECTION R-R
SCALE: 2/1
.026 TYP
.182
.167 TYP
CHEMICAL BOND BOTH SIDES
SCALE: NONE
SECTION A

F-1

3H

1006381 B

SYM	ZONE	DESCRIPTION	BY	CHK	DATE	APPROVED
A		REPLACES REV - WITH CHANGE PER TDRR 24277			1-23-65	
B		REVISED PER TDRR 25936			2/15/66	
C		REVISED PER TDRR 26206			3/1/66	



OPTIONAL INNER CORNER
.02 R
.00
2 PLACES
.32 DIA THRU
.33
14 "C" HOLES
.010 DIA
.218 DIA THRU
.222
18 "B" HOLES
.014 DIA
.25 R
4 PLACES
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296
.292
12.433
SEE NOTE 2.B.I.b. TYP ALL "A" HOLES FOR-001 ONLY
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.000 BSC
.198 DIA THRU
.200
4 "D" HOLES - SEE NOTE 2.B.I.b.
.006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
"F" HOLES
.014 DIA
SEE NOTE 2 B.I.b. FOR-001 ONLY
.015 REF
.025
.250 MAX REF
10.236
10.216
11.125 REF
A
A
.305
.172 REF
11.337
11.317
.270 R
.250
2 PLACES
.198 R
.178
8 PLACES
.184 DIA THRU
.188
C BORE .332 DIA X .203 DEEP
4 "E" HOLES - (SEE NOTE 2.B.I.b. FOR-001 ONLY)
.014 DIA
10.807
10.787
20.837
20.817
21.875
SEE NOTE 2.B.I.b. TYP ALL "E" HOLES FOR-001 ONLY
.200
.100
.294 REF
.25 SPHERICAL RAD TYP REF

SECTION A-A

Ⓐ REPLACES REV-WITH CHANGE

MASTER

QTY REQD	PART OR IDENTIFYING NO
NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS XXX ± .005 XX ± .01 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

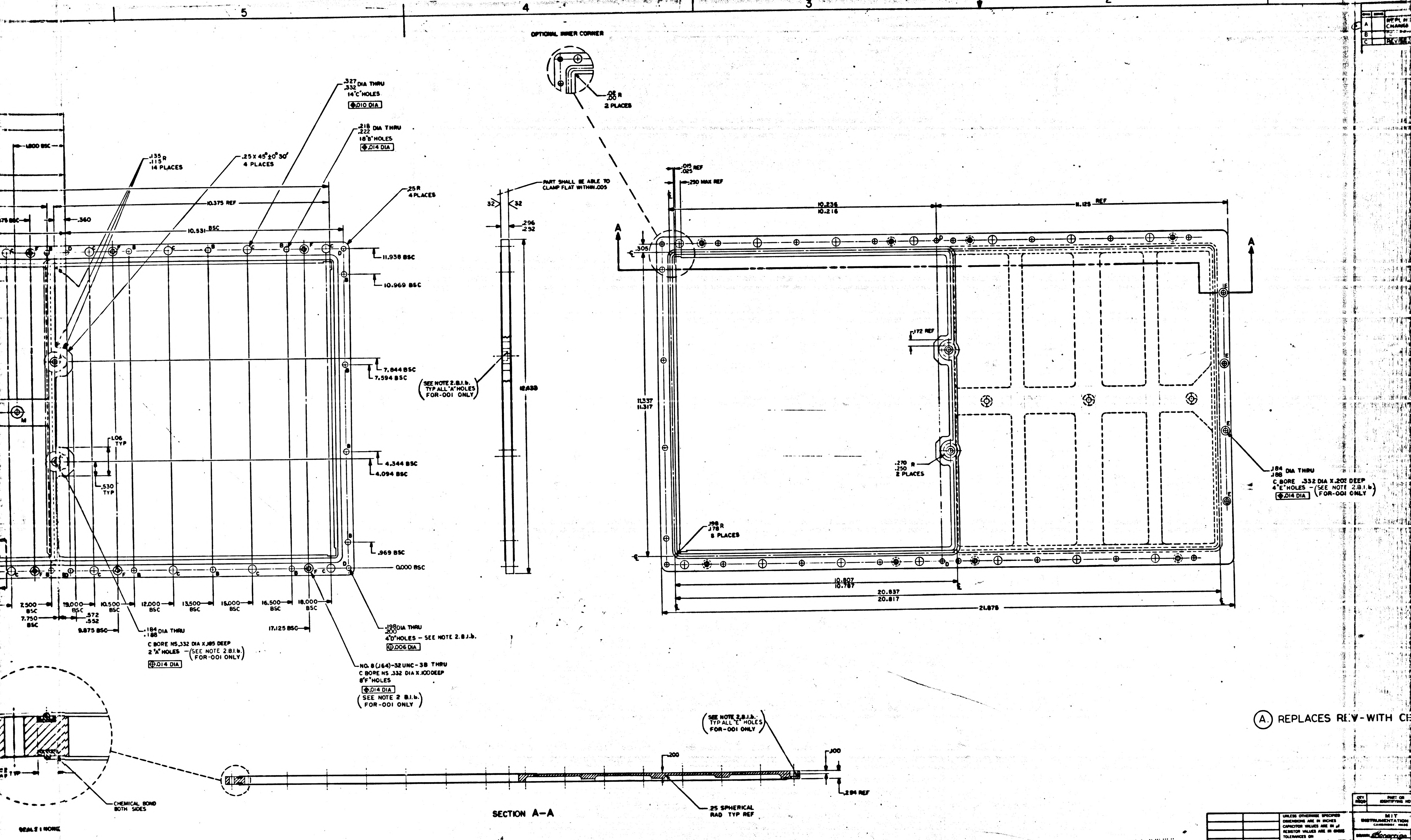
DRAWN Bonarrigo
CHECKED
APPROVED
APPROVED
MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE J
DRAWING NO. 1006381
SCALE 1/1
SHEET 1 OF 1

1006381 C


5
4
3
2
OPTIONAL INNER CORNER
.02 .00 R 2 PLACES
.327 .332 DIA THRU 14 "C" HOLES
.010 DIA
.218 .222 DIA THRU 18 "B" HOLES
.014 DIA
.135 .115 R 14 PLACES
.25 X 45° ±0° 30' 4 PLACES
1.800 BSC
10.375 REF
10.531 BSC
.360
.25 R 4 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
1.06 TYP
.530 TYP
7.500 BSC
7.750 BSC
9.000 BSC
.572 .552
9.875 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
17.125 BSC
.184 .188 DIA THRU
C BORE NS .332 DIA X .185 DEEP
2 "A" HOLES – (SEE NOTE 2.B.I.b. FOR-001 ONLY)
.014 DIA
.198 .200 DIA THRU
4 "D" HOLES – SEE NOTE 2.B.I.b.
.006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
.014 DIA
(SEE NOTE 2 B.I.b. FOR-001 ONLY)
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296 .292
12.433
(SEE NOTE 2.B.I.b. TYP ALL "A" HOLES FOR-001 ONLY)
.015 .025 REF
.290 MAX REF
10.236 10.216
11.125 REF
A
A
.305
11.337 11.317
.172 REF
.270 .250 R 2 PLACES
.198 .178 R 8 PLACES
.184 .188 DIA THRU
C BORE .332 DIA X .205 DEEP
4 "E" HOLES – (SEE NOTE 2.B.I.b. FOR-001 ONLY)
.014 DIA
10.807 10.787
20.837 20.817
21.875
CHEMICAL BOND BOTH SIDES
SCALE: NONE
(SEE NOTE 2.B.I.b. TYP ALL "E" HOLES FOR-001 ONLY)
.200
.100
.25 SPHERICAL RAD TYP REF
.294 REF
SECTION A–A

Ⓐ REPLACES REV-WITH C

QTY REQD	PART OR IDENTIFYING NO

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — .XXX ±.005 ±
.XX ±.01
DO NOT SCALE THIS DRAWING

MATERIAL

SEE REQUIREMENTS

MIT
INSTRUMENTATION
CAMBRIDGE, MASS

DRAWN Bonarrigo
CHECKED
APPROVED
APPROVED

MASTER

1006381 C

5 4 3 2

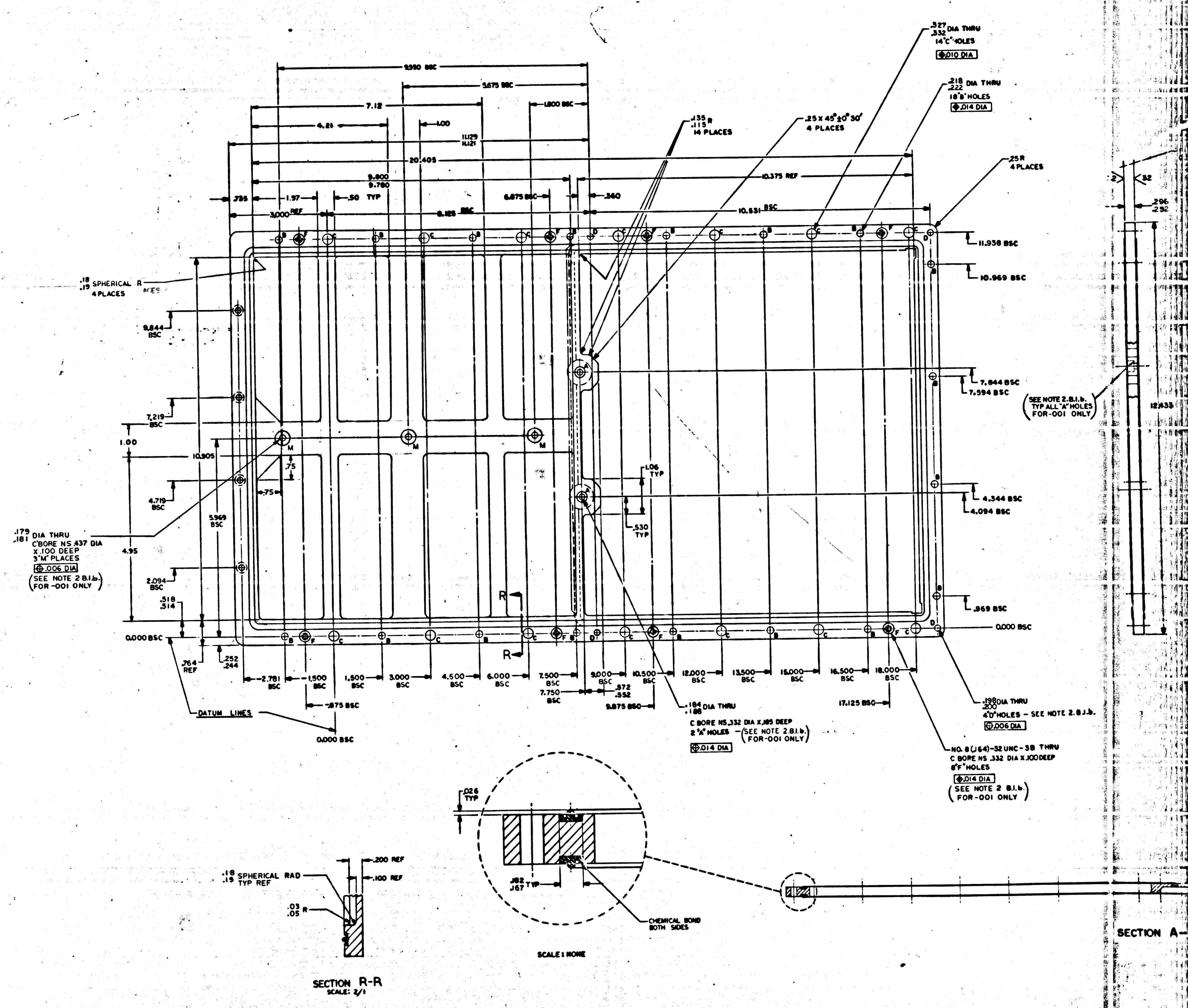
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: a) SEE CHART
       b) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. ALL INSIDE RADII TO BE .25 SPHERICAL UNLESS OTHERWISE SPECIFIED
   - F. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER
3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PART NO.	MATERIAL	FINISH	REMARKS
1006381-001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	FINISH PER ______	SURFACE & TAPPED HOLES SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER DO NOT EPOXY COAT. ELECTRICAL BONDING REQUIRED
1006381-002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541 TYPE II GRADE C CLASS 3	

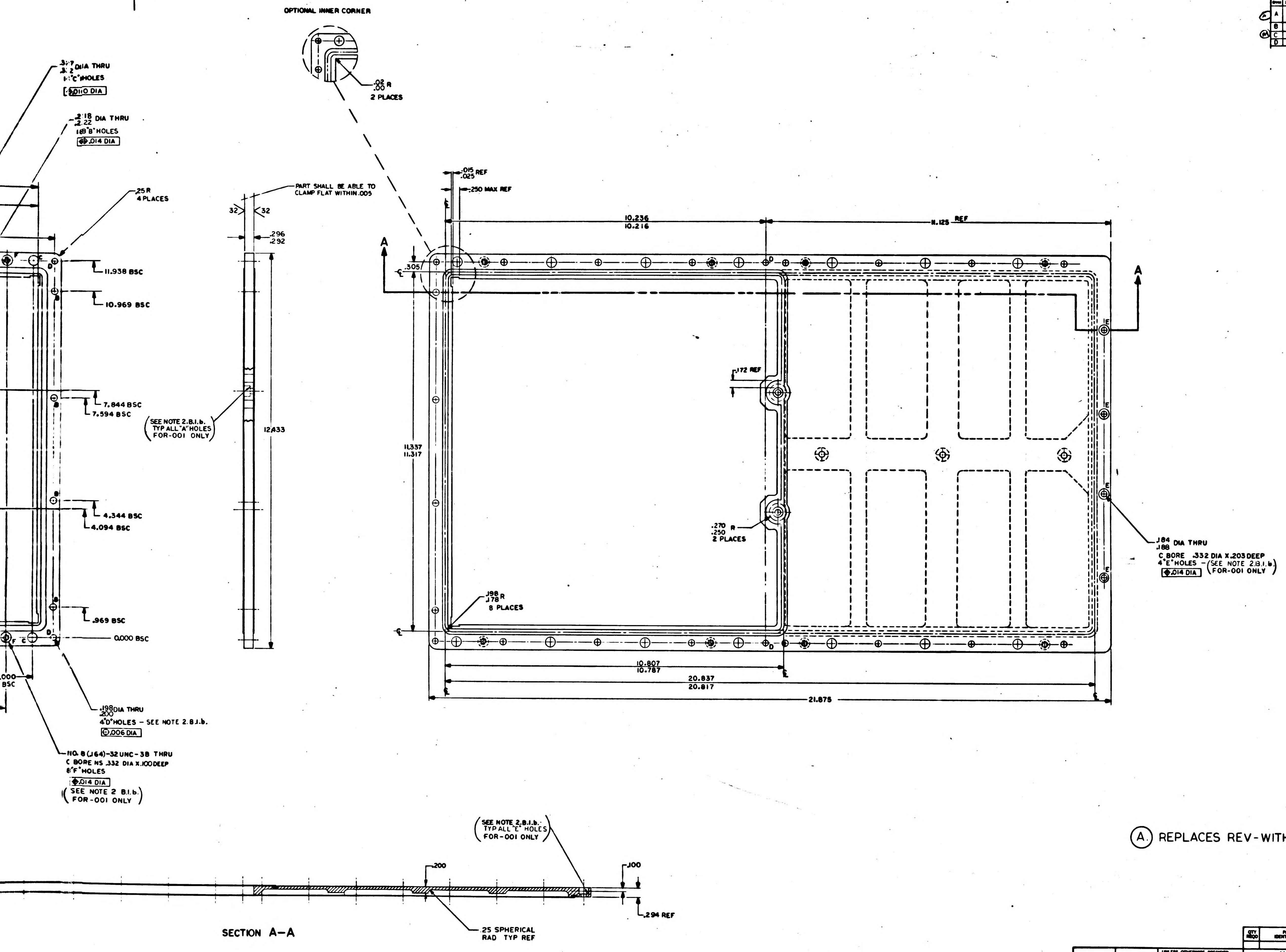
PROCURE ONLY FROM APPROVED SOURCES LIST ON ND1002034 FOR THIS DRAWING.

3H


9.550 BSC
5.675 BSC
7.12
1.800 BSC
4.21
1.00
11.129
11.121
20.405
9.800
9.780
10.375 REF
.735
1.97
.50 TYP
6.875 BSC
.360
3.000 REF
8.125 BSC
10.531 BSC
.135
.115 R
14 PLACES
.25 X 45° ±0° 30'
4 PLACES
.327
.332 DIA THRU
14 "C" HOLES
⌖ .010 DIA
.218
.222 DIA THRU
18 "B" HOLES
⌖ .014 DIA
.25 R
4 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
(SEE NOTE 2.B.1.b.
TYP ALL "A" HOLES
FOR-001 ONLY)
12.433
2
32
.296
.292
.18
.19 SPHERICAL R
4 PLACES
9.844 BSC
7.219 BSC
1.00
10.905
.75
.75
4.719 BSC
5.969 BSC
4.95
2.094 BSC
.518
.514
0.000 BSC
.764 REF
.252
.244
.179
.181 DIA THRU
C'BORE NS .437 DIA
X .100 DEEP
3 "M" PLACES
⌖ .006 DIA
(SEE NOTE 2 B.1.b.
FOR -001 ONLY)
M
1.06 TYP
.530 TYP
R
R
A
B
C
D
F
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
.572
.552
10.500 BSC
9.875 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
17.125 BSC
.875 BSC
DATUM LINES
0.000 BSC
.184
.188 DIA THRU
C BORE NS .332 DIA X .185 DEEP
2 "A" HOLES - (SEE NOTE 2.B.1.b.
FOR-001 ONLY)
⌖ .014 DIA
.198
.200 DIA THRU
4 "D" HOLES - SEE NOTE 2.B.1.b.
⌖ .006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
⌖ .014 DIA
(SEE NOTE 2 B.1.b.
FOR-001 ONLY)
.026 TYP
.182
.167 TYP
CHEMICAL BOND
BOTH SIDES
SCALE: NONE
.18
.19 SPHERICAL RAD
TYP REF
.200 REF
.100 REF
.03
.05 R
SECTION R-R
SCALE: 2/1
SECTION A-

1006381 C

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REPLACES REV — WITH CHANGE PER TDRR 24277			1-28-66	
B		REVISED PER TDRR 25936			2/15/66	WK
C		REVISED PER TDRR 26206			3/1/66	WK
D		REVISED PER TDRR 27103			3/22/66	WK



4
3
2
1
D
C
B
A
OPTIONAL INNER CORNER
.02 R
.00
2 PLACES
.3?? DIA THRU
1? "C" HOLES
.010 DIA
.218 DIA THRU
.222
18 "B" HOLES
.014 DIA
.25 R
4 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
.000 BSC
.198 DIA THRU
.200
4 "D" HOLES – SEE NOTE 2.B.1.b.
.006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
.014 DIA
(SEE NOTE 2 B.1.b.)
FOR-001 ONLY
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296
.292
12.433
(SEE NOTE 2.B.1.b. TYP ALL "A" HOLES FOR-001 ONLY)
.015 REF
.025
.250 MAX REF
10.236
10.216
11.125 REF
A
A
.305
.172 REF
11.337
11.317
.270 R
.250
2 PLACES
.198 R
.178
8 PLACES
D
D
E
E
E
E
.184 DIA THRU
.188
C BORE .332 DIA X .203 DEEP
4 "E" HOLES – (SEE NOTE 2.B.1.b)
.014 DIA
FOR-001 ONLY
10.807
10.787
20.837
20.817
21.875
(SEE NOTE 2.B.1.b. TYP ALL "E" HOLES FOR-001 ONLY)
.200
.100
.294 REF
.25 SPHERICAL RAD TYP REF
SECTION A–A

Ⓐ REPLACES REV-WITH CHANGE

1006381 D

MASTER

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS XXX ± .005 XX ± .01 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN Bonarrigo
CHECKED
APPROVED
APPROVED
MSC A. G. METZGER
W Kupfer 23 Nov 65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GASKET, RETAINED,
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
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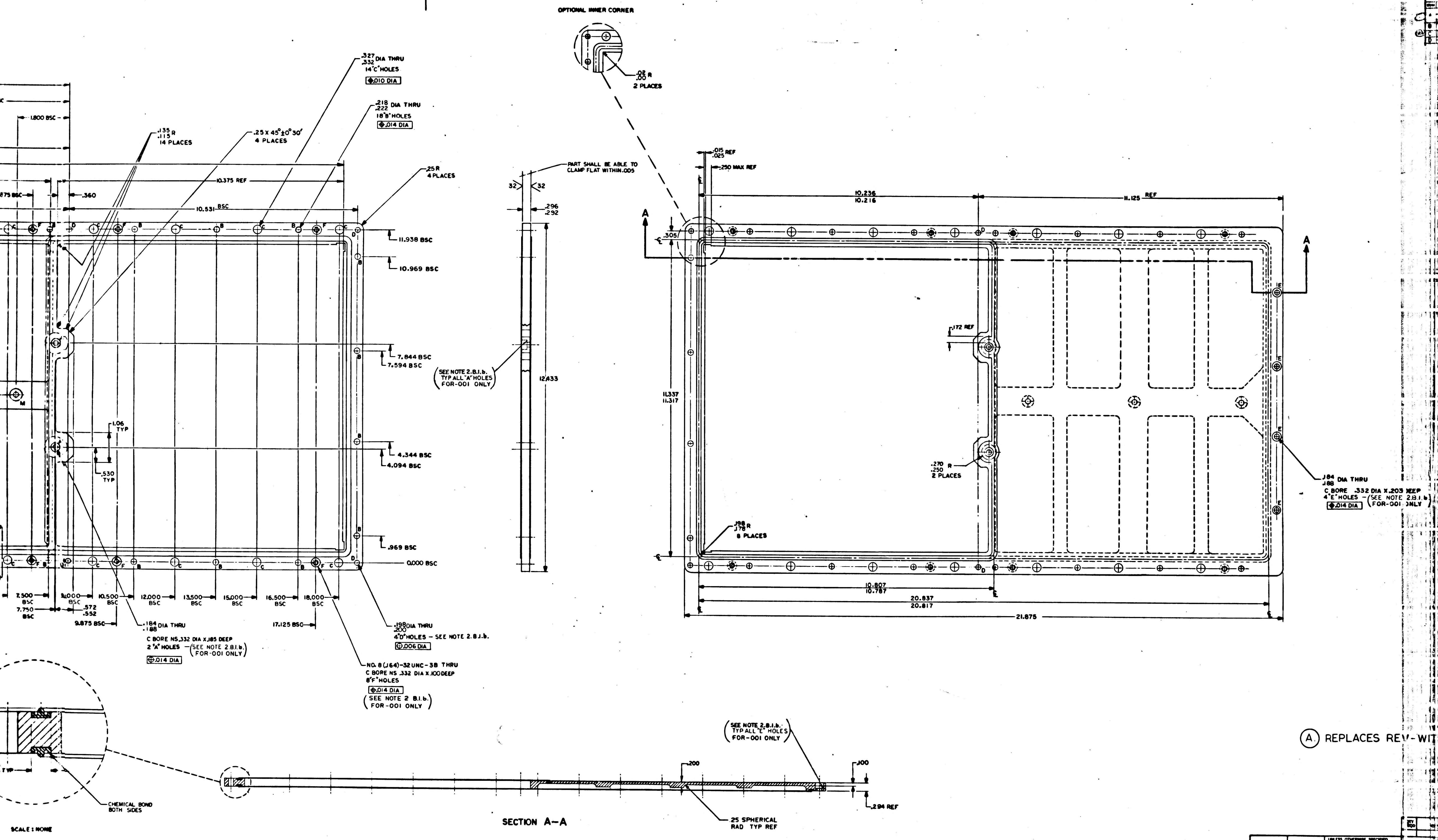
SCALE 1/1		SHEET 1 OF 1


OPTIONAL INNER CORNER
.02 R
.00
2 PLACES
.327
.332 DIA THRU
14 "C" HOLES
⊕ .010 DIA
.218
.222 DIA THRU
18 "B" HOLES
⊕ .014 DIA
.135 R
.115
14 PLACES
.25 X 45° ±0° 30′
4 PLACES
1.800 BSC
.25 R
4 PLACES
10.375 REF
10.531 BSC
.360
.875 BSC
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
1.06
TYP
.530
TYP
M
7.500
BSC
7.750
BSC
9.000
BSC
.572
.552
10.500
BSC
9.875 BSC
12.000
BSC
13.500
BSC
15.000
BSC
16.500
BSC
18.000
BSC
17.125 BSC
.184
.188 DIA THRU
C BORE NS .332 DIA X .185 DEEP
2 "A" HOLES —(SEE NOTE 2.B.I.b. FOR-001 ONLY)
⊕ .014 DIA
.198
.200 DIA THRU
4 "D" HOLES — SEE NOTE 2.B.I.b.
⊕ .006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
⊕ .014 DIA
(SEE NOTE 2 B.I.b. FOR-001 ONLY)
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296
.292
(SEE NOTE 2.B.I.b. TYP ALL "A" HOLES FOR-001 ONLY)
12.433
.015
.025 REF
.250 MAX REF
A
A
.305
10.236
10.216
11.125 REF
.172 REF
11.337
11.317
.270
.250 R
2 PLACES
.198
.178 R
8 PLACES
.184
.188 DIA THRU
C BORE .332 DIA X .203 DEEP
4 "E" HOLES —(SEE NOTE 2.B.I.b. FOR-001 ONLY)
⊕ .014 DIA
10.807
10.787
20.837
20.817
21.875
TYP
CHEMICAL BOND BOTH SIDES
SCALE : NONE
(SEE NOTE 2.B.I.b. TYP ALL "E" HOLES FOR-001 ONLY)
.200
.100
.294 REF
.25 SPHERICAL RAD TYP REF
SECTION A—A

Ⓐ REPLACES REV-WIT

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES CAPACITOR VALUES ARE IN μf RESISTOR VALUES ARE IN OHMS TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — .XXX ±.005 ± .XX ±.01 DO NOT SCALE THIS DRAWING
NEXT ASSY	USED ON	MATERIAL SEE REQUIREMENTS
APPLICATION		

QTY REQD

INSTRU

DRAWN

CHECKED

APPROVED

APPROVED

SC

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4

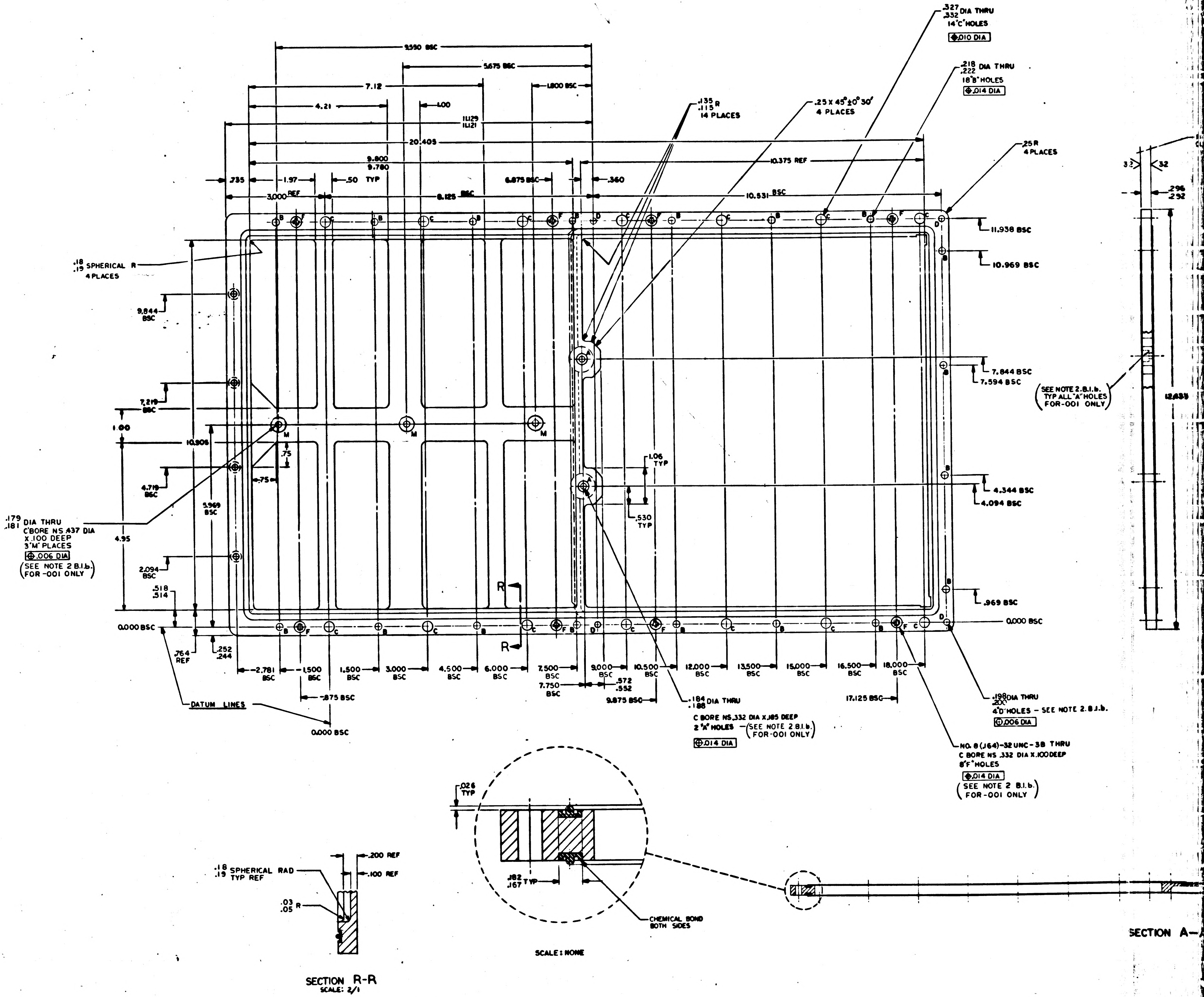
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: SEE CHART
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: a) SEE CHART
       b) SEE REMARKS COLUMN IN CHART
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. ALL INSIDE RADII TO BE .25 SPHERICAL UNLESS OTHERWISE SPECIFIED
   - F. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER

3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PART NO.	MATERIAL	FINISH	REMARKS
1006381-001	MAGNESIUM AZ 31B-H24 PER QQ-M-44 COND H24	ANODIZE PER MIL-M-45202 TYPE I CLASS C	SURFACE & TAPPED HOLES SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER MIL-M-3171 TYPE VI ELECTRICAL BONDING REQUIRED
1006381-002	ALUM-6061-T6 PER QQ-A-250/11 TEMP 6	CHROMATE PER MIL-C-5541 TYPE II GRADE C CLASS 3	

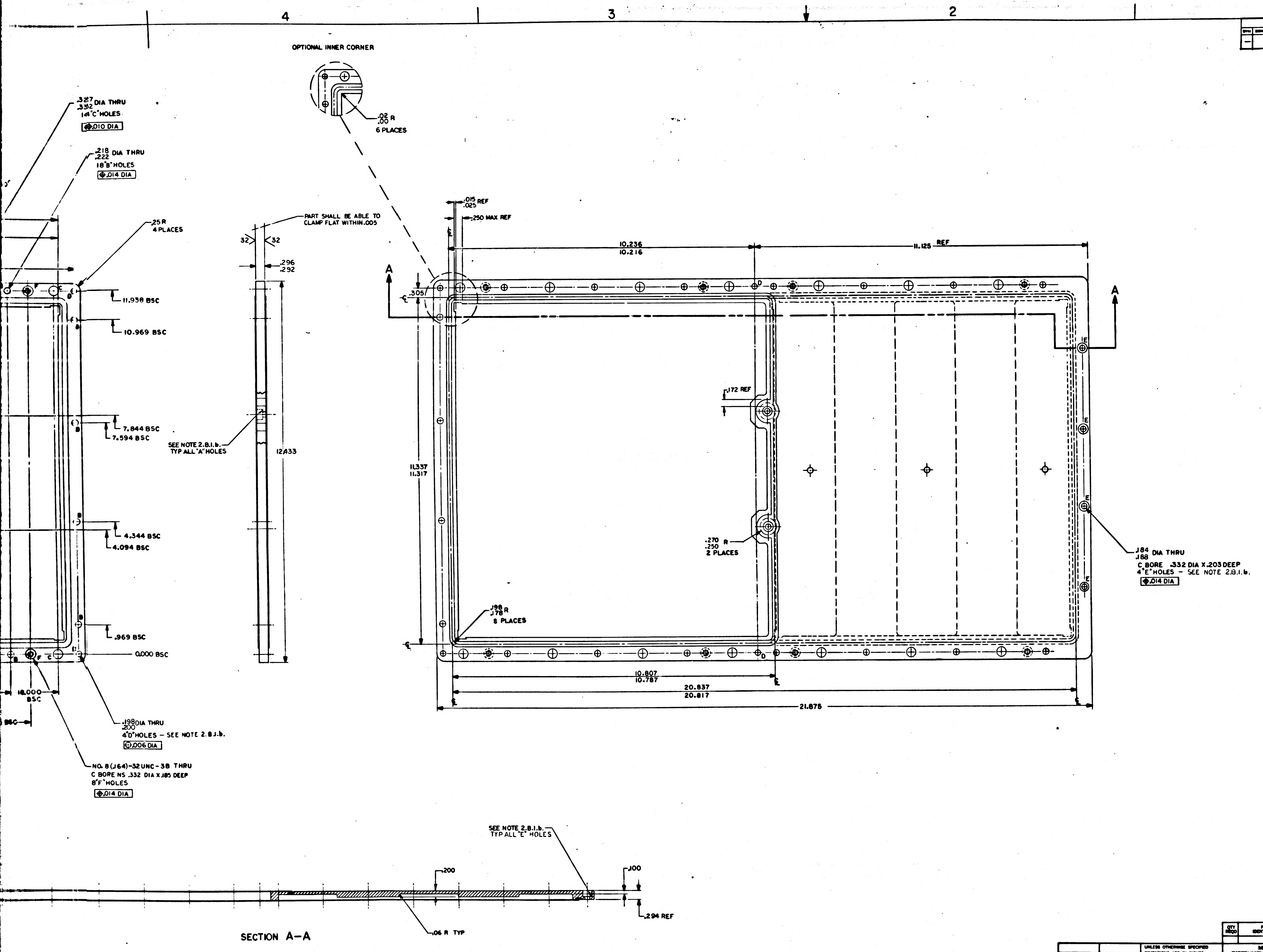
PROCURE ONLY FROM APPROVED SOURCES LIST ON ND1002034 FOR THIS DRAWING.

3H


9.550 BSC
5.675 BSC
7.12
1.800 BSC
4.21
1.00
11.129
11.121
20.405
9.800
9.780
10.375 REF
.735
1.97
.50 TYP
6.875 BSC
.360
3.000 REF
8.125 BSC
10.531 BSC
.135 R
.115
14 PLACES
.25 X 45° ± 0° 30′
4 PLACES
.327 DIA THRU
.332
14 "C" HOLES
⌖ .010 DIA
.218 DIA THRU
.222
18 "B" HOLES
⌖ .014 DIA
.25 R
4 PLACES
32
32
.296
.292
11.938 BSC
10.969 BSC
.18 SPHERICAL R
.19
4 PLACES
9.844 BSC
7.219 BSC
1.00
10.905
M
.75
.75
4.719 BSC
5.969 BSC
4.95
2.094 BSC
.518
.514
0.000 BSC
.764 REF
.252
.244
.179 DIA THRU
.181
C'BORE NS .437 DIA
X .100 DEEP
3 "M" PLACES
⌖ .006 DIA
(SEE NOTE 2 B.1.b.
FOR -001 ONLY)
1.06 TYP
.530 TYP
7.844 BSC
7.594 BSC
(SEE NOTE 2.B.1.b.
TYP ALL "A" HOLES
FOR -001 ONLY)
12.633
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
R
R
A
B
C
D
F
-2.781 BSC
-1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
.572
.552
10.500 BSC
9.875 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
17.125 BSC
-.875 BSC
DATUM LINES
0.000 BSC
.184 DIA THRU
.188
C BORE NS .332 DIA X .185 DEEP
2 "A" HOLES – (SEE NOTE 2.B.1.b.
FOR -001 ONLY)
⌖ .014 DIA
.198 DIA THRU
.200
4 "D" HOLES – SEE NOTE 2.B.1.b.
⌖ .006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .100 DEEP
8 "F" HOLES
⌖ .014 DIA
(SEE NOTE 2 B.1.b.
FOR -001 ONLY)
.026 TYP
.182
.167 TYP
CHEMICAL BOND
BOTH SIDES
SCALE: NONE
.200 REF
.100 REF
.18 SPHERICAL RAD
.19 TYP REF
.03 R
.05
SECTION R-R
SCALE: 2/1
SECTION A-

1006381 D

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 23084	LAL		10/1/65	


4
3
2
1
D
C
B
A
OPTIONAL INNER CORNER
.02 .00 R 6 PLACES
.327 .332 DIA THRU 14 "C" HOLES
⊕.010 DIA
.218 .222 DIA THRU 18 "B" HOLES
⊕.014 DIA
.25R 4 PLACES
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
18.000 BSC
.198 .200 DIA THRU 4 "D" HOLES - SEE NOTE 2.8.1.b.
⊙.006 DIA
NO. 8 (.164)-32 UNC-3B THRU C BORE NS .332 DIA X .185 DEEP 8 "F" HOLES
⊕.014 DIA
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296 .292
SEE NOTE 2.8.1.b. TYP ALL "A" HOLES
12.433
.015 .025 REF
.250 MAX REF
10.236 10.216
11.125 REF
A
A
.305
11.337 11.317
.172 REF
.270 .250 R 2 PLACES
.198 .178 R 8 PLACES
10.807 10.787
20.837 20.817
21.875
.184 .188 DIA THRU C BORE .332 DIA X .203 DEEP 4 "E" HOLES - SEE NOTE 2.8.1.b.
⊕.014 DIA
SEE NOTE 2.8.1.b. TYP ALL "E" HOLES
.200
.100
.06 R TYP
.294 REF
SECTION A-A

3H

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ±.005 .XX ±.01 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN W. Munson 24 SEP 65
CHECKED R. Hong 10/7/65
APPROVED
APPROVED
APPROVED MIT
NOT REQUIRED PER LETTER NASA PP7-65-612

GASKET, RETAINED
SPECIFICATION CONTROL DRAWING

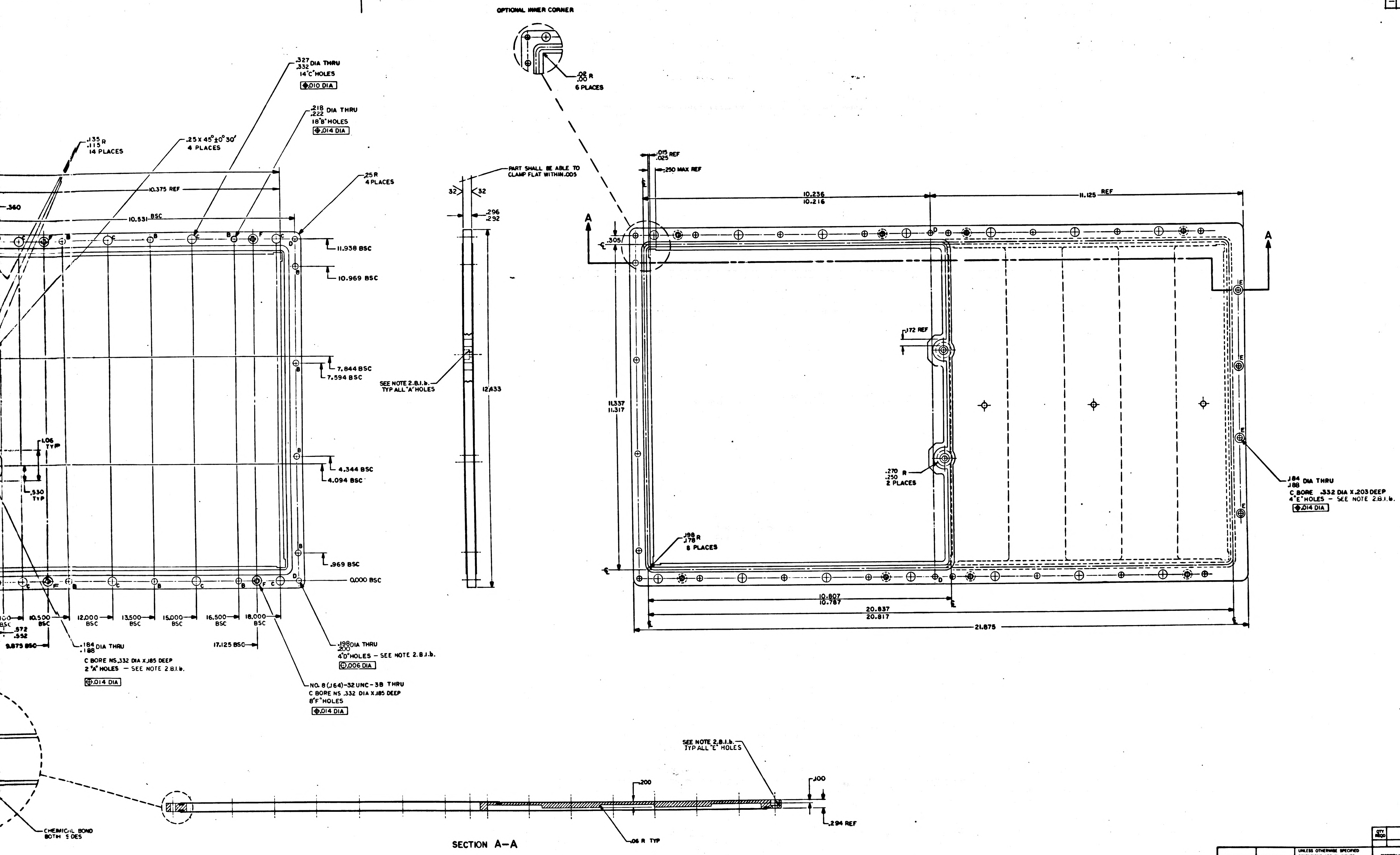
CODE IDENT NO. 80230
SIZE J
DRAWING NO. 1006381
SCALE 1/1
SHEET 1 OF 1

1006381 1

1006381 —

MASTER

SYM	ZONE	DESCRIPTION
—		INITIAL RELEASE CLASS TORR 23184



OPTIONAL INNER CORNER
.02 R .00 6 PLACES
.327 .332 DIA THRU 14"C" HOLES ⌖.010 DIA
.218 .222 DIA THRU 18"B" HOLES ⌖.014 DIA
.135 R .115 14 PLACES
.25 X 45°±0°30' 4 PLACES
.25 R 4 PLACES
10.375 REF
10.531 BSC
.360
11.938 BSC
10.969 BSC
7.844 BSC
7.594 BSC
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
1.06 TYP
.530 TYP
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
.572 .552
9.875 BSC
17.125 BSC
.184 .188 DIA THRU C BORE NS .332 DIA X.185 DEEP 2"A" HOLES — SEE NOTE 2.B.1.b. ⌖.014 DIA
.198 .200 DIA THRU 4"D" HOLES — SEE NOTE 2.B.1.b. ◎.006 DIA
NO. 8(.164)-32 UNC-3B THRU C BORE NS .332 DIA X.185 DEEP 8"F" HOLES ⌖.014 DIA
PART SHALL BE ABLE TO CLAMP FLAT WITHIN .005
32
32
.296 .292
SEE NOTE 2.B.1.b. TYP ALL "A" HOLES
12.433
.015 .025 REF
.250 MAX REF
10.236 10.216
11.125 REF
A
A
.305
11.337 11.317
.172 REF
.270 .250 R 2 PLACES
.198 .178 R 8 PLACES
.184 .188 DIA THRU C BORE .332 DIA X.203 DEEP 4"E" HOLES — SEE NOTE 2.B.1.b. ⌖.014 DIA
10.807 10.787
20.837 20.817
21.875
SEE NOTE 2.B.1.b. TYP ALL "E" HOLES
.200
.100
.294 REF
.06 R TYP
CHEMICAL BOND BOTH SIDES
SECTION A—A

MASTER

QTY REQD	PART OR IDENTIFYING NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — .XXX ± .005 ±
.XX ± .01
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN W. Mason 24 SEPT
CHECKED R. Hong
APPROVED
APPROVED
APPROVED MIT
NOT REQUIRED PER LETTER NASA PI7-65-612

GASKE
SPECIFICATI

CODE IDENT NO 80230 J
SCALE 1/1

REQUIREMENTS:

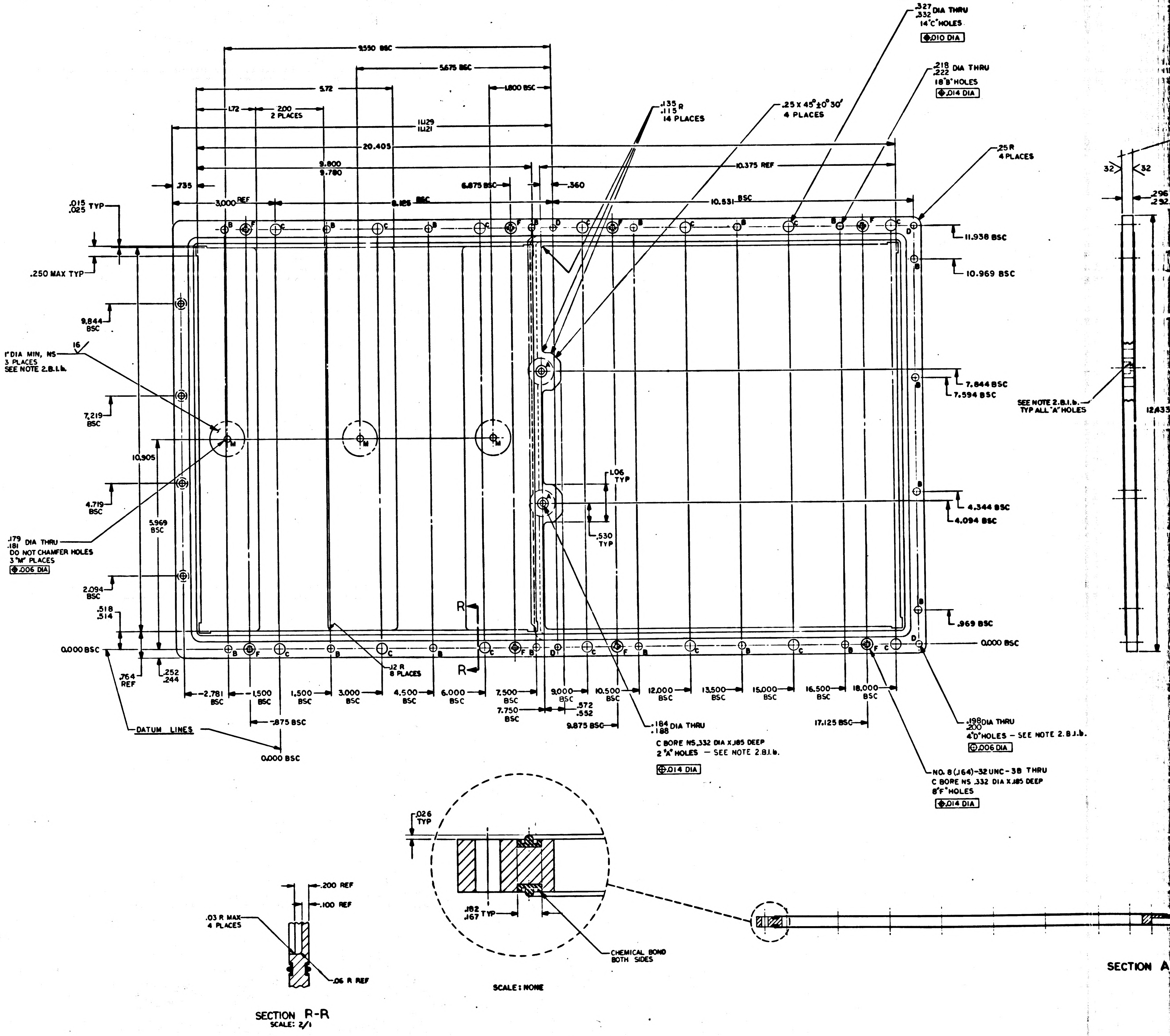
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND1002215, CLASS 1 CODE 4

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) RETAINER: MAGNESIUM/HK31A-H24 PER MIL-M-26075.
     - (2) SEAL: BUTYL RUBBER PER AMS 3238.
   - B. FINISH:
     - (1) RETAINER: a) ANODIZE PER MIL-M-45202, TYPE I CLASS C.
       b) SURFACE SHALL BE FREE OF ANODIZE. TREAT SURFACE INDICATED PER ND1002040. DO NOT EPOXY COAT, ELECTRICAL BONDING REQUIRED.
   - C. SURFACE ROUGHNESS SHALL BE 125√ PER MIL-STD-10 UNLESS OTHERWISE SPECIFIED.
   - D. REMOVE ALL BURRS AND BREAK SHARP EDGES.
   - E. VENDOR SHALL SUPPLY CURE DATE OF ELASTOMER.

3. DESIGN:
   - A. MAX. OPERATING TEMPERATURE: +200°F
   - B. OPERATING PRESSURE: 0-17 PSI DIFFERENTIAL
   - C. MEDIUM SEALED: 90% NITROGEN 10% HELIUM.
   - D. VACUUM SERVICE: 10^{-6} TORR
   - E. SEALING: WHEN PROPERLY INSTALLED AND COMPRESSED TO THE PLATE LEVEL (ZERO DEFLECTION OF MATING FLANGES) THE RUBBER SHALL BE CAPABLE OF SEALING AGAINST A LEAKAGE OF 10^{-8} ATM CC/SEC/INCH OF SEAL OF DRY NITROGEN AT A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE

PROCURE ONLY FROM APPROVED SOURCES LIST ON ND1002034 FOR THIS DRAWING.

3H


9.550 BSC
5.675 BSC
5.72
1.800 BSC
1.72
2.00
2 PLACES
11.129
11.121
20.405
9.800
9.780
.735
6.875 BSC
.360
10.375 REF
3.000 REF
8.125 BSC
10.531 BSC
.015
.025 TYP
.250 MAX TYP
.135
.115 R
14 PLACES
.25 X 45°±0°30′
4 PLACES
.327
.332 DIA THRU
14 "C" HOLES
⌖.010 DIA
.218
.222 DIA THRU
18 "B" HOLES
⌖.014 DIA
.25 R
4 PLACES
32
32
.296
.292
11.938 BSC
10.969 BSC
9.844 BSC
16
1" DIA MIN, NS
3 PLACES
SEE NOTE 2.B.1.b.
7.219 BSC
10.905
4.719 BSC
5.969 BSC
.179
.181 DIA THRU
DO NOT CHAMFER HOLES
3 "M" PLACES
⌖.006 DIA
2.094 BSC
.518
.514
0.000 BSC
.764 REF
.252
.244
M
B
C
D
F
1.06 TYP
.530 TYP
7.844 BSC
7.594 BSC
SEE NOTE 2.B.1.b.
TYP ALL "A" HOLES
12.435
4.344 BSC
4.094 BSC
.969 BSC
0.000 BSC
R
R
.12 R
8 PLACES
2.781 BSC
1.500 BSC
1.500 BSC
3.000 BSC
4.500 BSC
6.000 BSC
7.500 BSC
7.750 BSC
9.000 BSC
.572
.552
9.875 BSC
10.500 BSC
12.000 BSC
13.500 BSC
15.000 BSC
16.500 BSC
18.000 BSC
17.125 BSC
.875 BSC
DATUM LINES
0.000 BSC
.184
.188 DIA THRU
C BORE NS .332 DIA X .185 DEEP
2 "A" HOLES — SEE NOTE 2.B.1.b.
⌖.014 DIA
.198
.200 DIA THRU
4 "D" HOLES — SEE NOTE 2.B.1.b.
⌖.006 DIA
NO. 8 (.164)-32 UNC-3B THRU
C BORE NS .332 DIA X .185 DEEP
8 "F" HOLES
⌖.014 DIA
.026 TYP
.182
.167 TYP
CHEMICAL BOND
BOTH SIDES
SCALE: NONE
.200 REF
.100 REF
.03 R MAX
4 PLACES
.06 R REF
SECTION R-R
SCALE: 2/1
SECTION A

1006381 —

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006386

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24071			11-16-65	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002056, INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.
   - D. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER. SERIALIZE UNITS PER ND 1002023.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SHALL BE AS SHOWN.
     - (2) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE 1, THICKNESS 0.0001 MINIMUM, 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (3) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: INITIAL 14 FOOT LAMBERTS AVERAGE MINIMUM WHEN EXCITED BY 250 VRMS ± 1% AT 800 ± 10 CPS SINE WAVE WITH NO DISPLAY LESS THAN 12 FOOT LAMBERTS
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1)
     - (3) TOTAL CURRENT (ALL AREAS ENERGIZED PER 2.B.(1): 3.75 MA
     - (4) CASE TO ALL PIN RESISTANCE: 1.0 MEGOHM MINIMUM

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED AND CAPABLE OF OPERATING UNDER A REDUCED PRESSURE EQUIVALENT TO 100,000 ALTITUDE.
   - E. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - F. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - G. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).
   - H. LEAD STRENGTH: LEAD SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

4. BURN-IN (VENDOR): UNITS WHICH MEET INITIAL ELECTRICAL REQUIREMENTS SHALL BE OPERATED FOR 100 HOURS, EXCITED PER 2.B.(1); AFTER BURN-IN UNIT SHALL MEET INITIAL ELECTRICAL CHARACTERISTICS, EXCEPT THAT BRIGHTNESS SHALL BE NOT LESS THAN 9.5 FOOT LAMBERTS. BEFORE-AND-AFTER BURN-IN READINGS OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL ACCOMPANY UNITS.

TABLE I

PIN NO.	CONNECTS TO
1	AREA A
2 & 4	AREA B
3	AREA C
G1, G2	COMMON GRD RETURN

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN		4 NOV 65
CHECKED		9 NOV 65
APPROVED		
APPROVED	Eldon C Hall	16 Nov 65
APPROVED MIT	A. G. METZGER	16 Nov 65
APPROVED MSC		DATE

INDICATOR, ALARM, ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

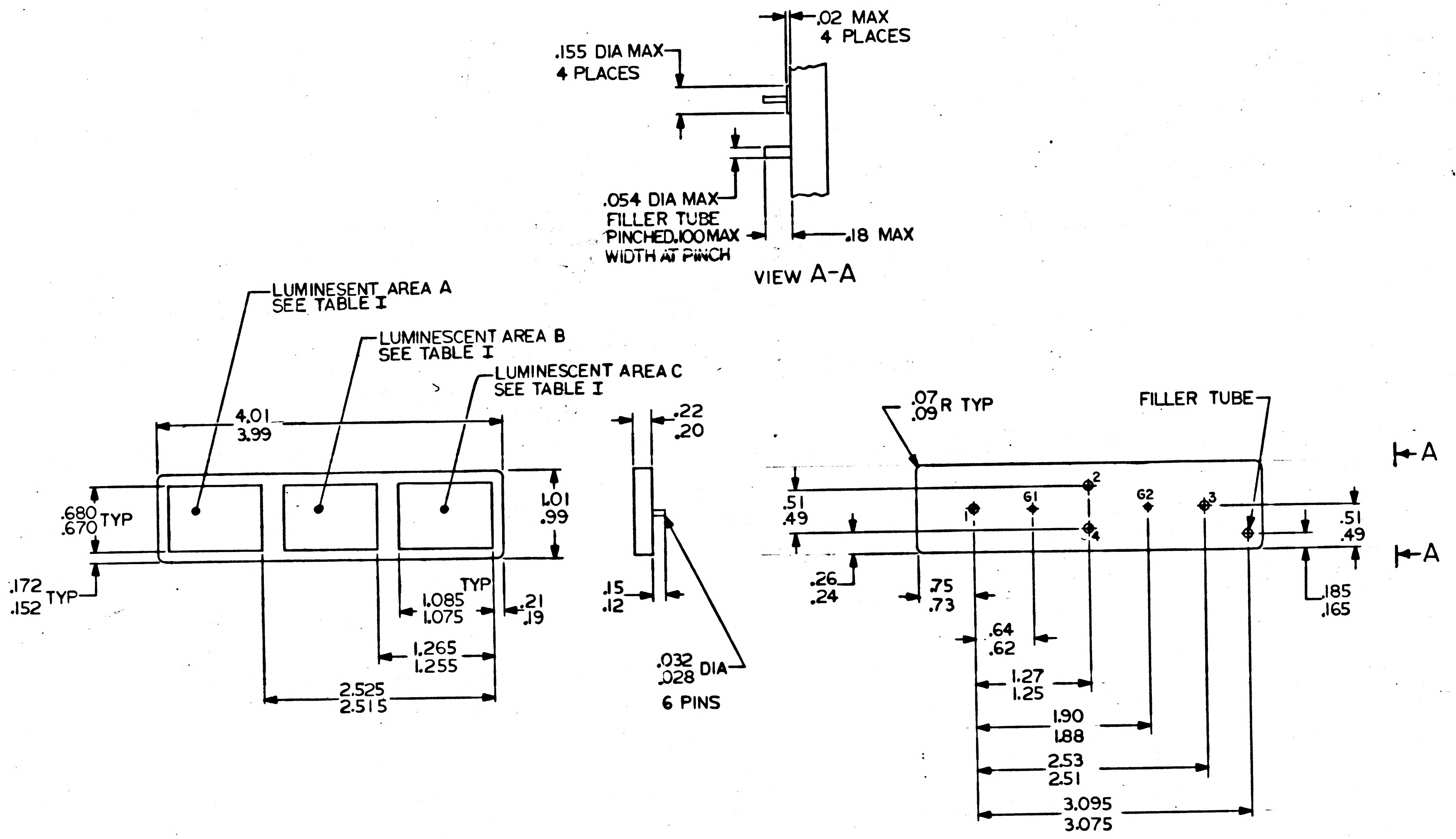
CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006386
SCALE NONE		SHEET 1 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006386

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24071			11-16-65	


.02 MAX
4 PLACES
.155 DIA MAX
4 PLACES
.054 DIA MAX
FILLER TUBE
PINCHED .100 MAX
WIDTH AT PINCH
.18 MAX
VIEW A-A
LUMINESENT AREA A
SEE TABLE I
LUMINESCENT AREA B
SEE TABLE I
LUMINESCENT AREA C
SEE TABLE I
4.01
3.99
.680
.670 TYP
1.01
.99
.172
.152 TYP
1.085
1.075 TYP
.21
.19
1.265
1.255
2.525
2.515
.22
.20
.15
.12
.032
.028 DIA
6 PINS
.07
.09 R TYP
FILLER TUBE
A
A
1
2
G1
G2
3
4
.51
.49
.51
.49
.26
.24
.75
.73
.64
.62
1.27
1.25
1.90
1.88
2.53
2.51
3.095
3.075
.185
.165

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Jim DS DAS 4Nov65
CHECKED ZDFay HBM 9Nov65
APPROVED
APPROVED Eldon C Hall 16 Nov 65
APPROVED MIT A. C. METZGER 16 Nov 65
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM, ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006386
SCALE NONE		SHEET 2 OF 2

MASTER

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006387 A

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			2/15/66	W/R

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056.

   D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.

   E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100%)

   A. MECHANICAL AND PHYSICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) SURFACE ROUGHNESS: 125√ UNLESS OTHERWISE SPECIFIED.

      (3) MARKING: AS SPECIFIED IN NOTES 1.D. AND 1.E. NO MARKING SHALL APPEAR ON THE 32√ AREA.

      (4) PANEL COLOR AND MARKING:

         COLOR, ENERGIZED: CROSS HATCHED LEGEND AREAS TO BE YELLOW, ALL OTHER LEGEND AREAS TO BE WHITE.

         COLOR, UNENERGIZED: LEGEND BACKGROUND TO BE LOW REFLECTIVE, DIFFUSE, NEUTRAL GREY WHEN NOT ENERGIZED. CONTRAST BETWEEN BLACK CHARACTERS AND UNLIGHTED BACKGROUND SHALL BE BETWEEN 2 TO 4 UNITS IN ACCORDANCE WITH MIL-P-7788.

         SURFACE GLOSS: THE DISPLAY AREAS SHALL HAVE A SURFACE GLOSS OF 5 UNITS OR LESS AS MEASURED PER MIL-P-7788 WHEN IN THE UNENERGIZED CONDITION.

         MARKING, LEGEND: LEGENDS SHALL BE AS SHOWN ON DRAWING. CHARACTERS SHALL BE GORTON CONDENSED WITH PROPORTIONS PER ND 1002122, TYPE II, CLASS 2. THE OVERALL HEIGHT OF CHARACTERS SHALL BE .156. THE LINE STROKE WIDTH SHALL BE .025/.030. LEGEND SHALL BE CENTERED ON DISPLAY FACE PLATE. FILL SHALL BE BLACK COLOR NO. 37038 PER FED-STD-595 AND SHALL BE OPAQUE WHEN LEGEND IS ENERGIZED.

      (5) BRIGHTNESS: LEGEND BACKGROUNDS SHALL HAVE A BRIGHTNESS LEVEL OF 15 ± 3 FOOT-LAMBERTS AT 5.0 ± .05 VDC THE LEGENDS MUST BE READABLE (WHEN ILLUMINATED) UNDER AN AMBIENT 50 FOOT CANDLE ILLUMINATION.

      (6) ISOLATION: THERE SHALL BE NO LIGHT LEAKAGE FROM LIT TO UNLIT LEGEND AREAS. PAINT SHALL NOT BE DEEMED AN ADEQUATE LIGHT BLOCK.

   B. ELECTRICAL CHARACTERISTICS:

      (1) POWER DISSIPATION:

         YELLOW DISPLAYS: 0.180 AMPERES ± 15% AT 5.0 ± 0.1 VDC.

         WHITE DISPLAYS: 0.225 AMPERES ± 15% AT 5.0 ± 0.1 VDC

      (2) DIELECTRIC WITHSTANDING VOLTAGE: 200 ± 25 VRMS AT 60 CPS FOR 5 SECONDS BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND THE CASE PER MIL-STD-202, METHOD 301.

      (3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 100 VDC AT SEA LEVEL, 70° ± 10°F, 50% RH MAXIMUM, BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND CASE PER MIL-STD-202, METHOD 302.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	H. Wong	17NOV65
CHECKED	J. Yon	22NOV65
APPROVED		
APPROVED	Eldon C Hall	14Dec65
APPROVED MIT	A. C. METZGER	14Dec65
APPROVED MSC		
		DATE

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387
SCALE NONE		SHEET 1 OF 3

1006387 A

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			4/19/66	WK

REQUIREMENTS: (CONTINUED)

3. DESIGN:

A. OPERATING LIFE: 4000 HOURS MINIMUM AT POWER DISSIPATION PER NOTE 2.B.(1) AT 70° ± 10°F AMBIENT TEMPERATURE.

B. MATERIAL: ALL MATERIAL SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF THIS DRAWING AND EXHIBIT NO TOXICITY.

(1) PLASTIC FACE PLATE: ACRYLIC SHEET PLASTIC PER MIL-P-5425, FINISH A.

(2) CASE: ALUMINUM ALLOY.

C. FINISHES:

(1) ALUMINUM CASE: CHROMATE TREAT PER MIL-C-5541.

(2) PAINT SURFACES MARKED "A" AND TOP BORDER AREA GREY EPOXY ENAMEL PER ND1002279 USING 1008809-1

D. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND 1002136.

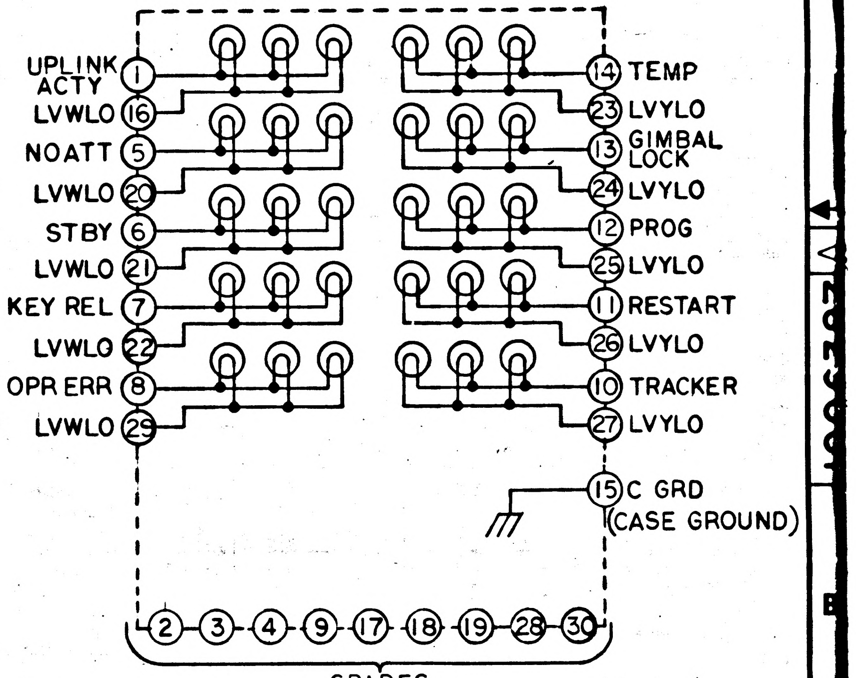
E. PANEL COLORS: [REF NOTE 2.A.(4)] YELLOW COLOR TO BE AVIATION YELLOW AND WHITE COLOR TO BE AVIATION WHITE PER MIL-C-25050. COLOR COORDINATES SHALL REMAIN WITHIN THE LIMITS OF THE SPECIFIED AVIATION COLORS WHEN ENERGIZED FROM 5.0 THRU 3.0 VDC. THE X - COORDINATE FOR THE AVIATION WHITE DISPLAYS SHALL NOT EXCEED X = .560 WHEN ENERGIZED FROM 5.0 THRU 2.0 VDC.

F. LAMPS: EACH OF THE 10 LEGEND AREAS SHALL BE ILLUMINATED BY 3 LAMPS, PARALLEL WIRED AS SHOWN IN THE SCHEMATIC. YELLOW DISPLAY LAMPS TO BE MS 24367-680. WHITE DISPLAY LAMPS TO BE MS 24367-713.

G. WHEN MOUNTED ON A SUITABLE FIXTURE, THE UNIT SHALL BE CAPABLE OF WITHSTANDING A PRESSURE OF 15 PSIA OF HELIUM, APPLIED AGAINST THE 32 AREA, WHEN THE EXTERNAL PRESSURE IS REDUCED TO 1" HG EQUIVALENT PRESSURE; WHEN SUBJECTED TO THIS DIFFERENTIAL PRESSURE, THE UNIT SHALL EXHIBIT A LEAK RATE OF NO MORE THAN 1×10^{-5} ATM CC/SEC OVER THE TEMPERATURE RANGE OF -10°C TO +82°C.

4. NOTE: THIS UNIT IS TO BE MOUNTED ON A HEAT SINK WHEN LEGENDS ARE ENERGIZED FOR PERIODS LONGER THAN TWO (2) MINUTES. A SATISFACTORY HEAT SINK CAN BE AN ALUMINUM OR BRASS PLATE 10" X 10" X 1/8" WITH A CENTERED RECTANGULAR OPENING FOR MOUNTING THE UNIT.

MASTER



SPARES

FIGURE 1 - SCHEMATIC

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. Wong 17NOV65
CHECKED 22NOV65
APPROVED
APPROVED Ellen C Hall 14Dec65
APPROVED MIT A. C. METZGER 14Dec65
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387

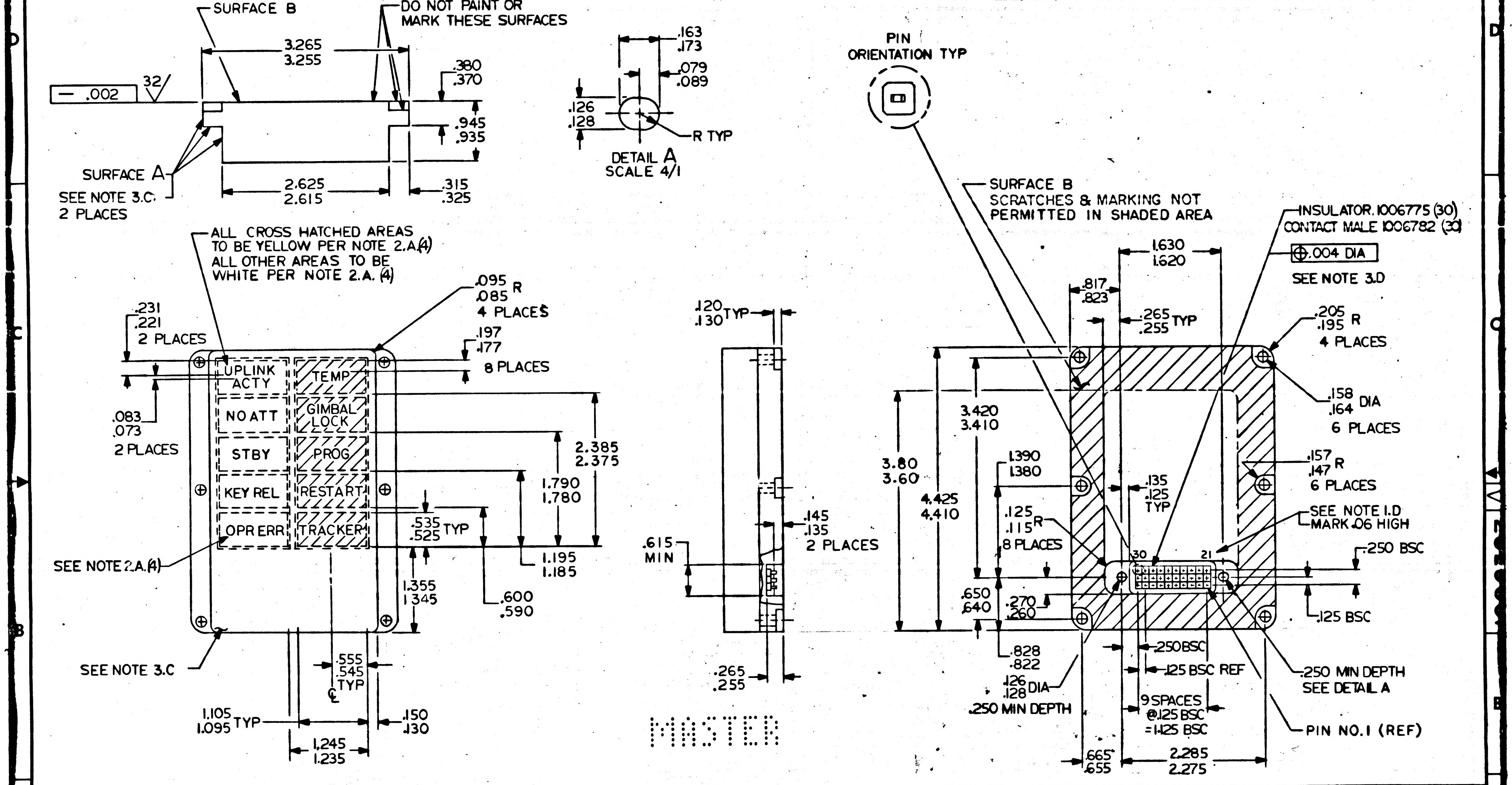
SCALE NONE
SHEET 2 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

A 1006387

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			2/15/66	WR



SURFACE B
DO NOT PAINT OR MARK THESE SURFACES
3.265
3.255
.380
.370
— .002
32
.945
.935
SURFACE A
SEE NOTE 3.C.
2 PLACES
2.625
2.615
.315
.325
.163
.173
.079
.089
.126
.128
R TYP
DETAIL A
SCALE 4/1
PIN ORIENTATION TYP
SURFACE B
SCRATCHES & MARKING NOT PERMITTED IN SHADED AREA
INSULATOR 1006775 (30)
CONTACT MALE 1006782 (30)
.004 DIA
SEE NOTE 3.D
ALL CROSS HATCHED AREAS TO BE YELLOW PER NOTE 2.A.(4)
ALL OTHER AREAS TO BE WHITE PER NOTE 2.A. (4)
.095
.085
R
4 PLACES
.231
.221
2 PLACES
.197
.177
8 PLACES
.083
.073
2 PLACES
UPLINK ACTY
TEMP
NO ATT
GIMBAL LOCK
STBY
PROG
KEY REL
RESTART
OPR ERR
TRACKER
2.385
2.375
1.790
1.780
.535
.525
TYP
1.195
1.185
1.355
1.345
.600
.590
SEE NOTE 2.A.(4)
SEE NOTE 3.C
.555
.545
TYP
1.105
1.095
TYP
.150
.130
1.245
1.235
.120
.130
TYP
.145
.135
2 PLACES
.615 MIN
.265
.255
MASTER
1.630
1.620
.817
.823
.265
.255
TYP
.205
.195
R
4 PLACES
.158
.164
DIA
6 PLACES
3.420
3.410
3.80
3.60
4.425
4.410
1.390
1.380
.135
.125
TYP
.157
.147
R
6 PLACES
.125
.115
R
8 PLACES
SEE NOTE 1.D
MARK .06 HIGH
30
21
.250 BSC
.650
.640
.270
.260
.125 BSC
.828
.822
.250 BSC
.125 BSC REF
.126
.128
DIA
.250 MIN DEPTH
.250 MIN DEPTH
SEE DETAIL A
9 SPACES
@.125 BSC
=1.125 BSC
PIN NO.1 (REF)
.665
.655
2.285
2.275

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Jim Doty 19 Nov 65
CHECKED 22 NOV 65
APPROVED
APPROVED Eldon C Hall 14 Dec 65
APPROVED MIT W Kupfer 14 Dec 65
APPROVED MSC A.C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006387
SCALE NONE
SHEET 3 OF 3

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006387 B

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			2/15/66	W/R
B		REVISED PER TDRR 28430	WFH		5-10-66	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100%)
   - A. MECHANICAL AND PHYSICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) SURFACE ROUGHNESS: 125/ UNLESS OTHERWISE SPECIFIED.
     - (3) MARKING: AS SPECIFIED IN NOTES 1.D. AND 1.E. NO MARKING SHALL APPEAR ON THE 32/ AREA.
     - (4) PANEL COLOR AND MARKING:

       COLOR, ENERGIZED: CROSS HATCHED LEGEND AREAS TO BE YELLOW, ALL OTHER LEGEND AREAS TO BE WHITE.

       COLOR, UNENERGIZED: LEGEND BACKGROUND TO BE LOW REFLECTIVE, DIFFUSE, NEUTRAL GREY WHEN NOT ENERGIZED. CONTRAST BETWEEN BLACK CHARACTERS AND UNLIGHTED BACKGROUND SHALL BE BETWEEN 2 TO 4 UNITS IN ACCORDANCE WITH MIL-P-7788.

       SURFACE GLOSS: THE DISPLAY AREAS SHALL HAVE A SURFACE GLOSS OF 5 UNITS OR LESS AS MEASURED PER MIL-P-7788 WHEN IN THE UNENERGIZED CONDITION.

       MARKING, LEGEND: LEGENDS SHALL BE AS SHOWN ON DRAWING. CHARACTERS SHALL BE GORTON CONDENSED WITH PROPORTIONS PER ND 1002122, TYPE II, CLASS 2. THE OVERALL HEIGHT OF CHARACTERS SHALL BE .156. THE LINE STROKE WIDTH SHALL BE .025/.030. LEGEND SHALL BE CENTERED ON DISPLAY FACE PLATE. FILL SHALL BE BLACK COLOR NO. 37038 PER FED-STD-595 AND SHALL BE OPAQUE WHEN LEGEND IS ENERGIZED.
     - (5) BRIGHTNESS: LEGEND BACKGROUNDS SHALL HAVE A BRIGHTNESS LEVEL OF 15 ± 3 FOOT-LAMBERTS AT 5.0 ± .05 VDC THE LEGENDS MUST BE READABLE (WHEN ILLUMINATED) UNDER AN AMBIENT 50 FOOT CANDLE ILLUMINATION.
     - (6) ISOLATION: THERE SHALL BE NO LIGHT LEAKAGE FROM LIT TO UNLIT LEGEND AREAS. PAINT SHALL NOT BE DEEMED AN ADEQUATE LIGHT BLOCK.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) POWER DISSIPATION:

       YELLOW DISPLAYS: 0.180 AMPERES ± 15% AT 5.0 ± 0.1 VDC.

       WHITE DISPLAYS: 0.225 AMPERES ± 15% AT 5.0 ± 0.1 VDC
     - (2) DIELECTRIC WITHSTANDING VOLTAGE: 200 ± 25 VRMS AT 60 CPS FOR 5 SECONDS BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND THE CASE PER MIL-STD-202, METHOD 301.
     - (3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 100 VDC AT SEA LEVEL, 70° ± 10°F, 50% RH MAXIMUM, BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND CASE PER MIL-STD-202, METHOD 302.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

DASH NO.	APPLICABLE NOTES
-001	1 THRU 4
-000	1 THRU 4 EXCEPT 3,C,3

NOTE APPLICATION

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

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DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	W. Wong	17NOV65
CHECKED	J. Yom	22NOV65
APPROVED		
APPROVED	Eldon C Hall	14Dec65
APPROVED MIT	A. C. METZGER	14Dec65
APPROVED MSC		
		DATE

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387

SCALE NONE SHEET 1 OF 3

1006387 B

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1006387 B

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			3/18/66	WK
B		REVISED PER TDRR 28430			5-10-66	

REQUIREMENTS: (CONTINUED)

3. DESIGN:

A. OPERATING LIFE: 4000 HOURS MINIMUM AT POWER DISSIPATION PER NOTE 2.B.(1) AT 70° ± 10°F AMBIENT TEMPERATURE.

B. MATERIAL: ALL MATERIAL SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF THIS DRAWING AND EXHIBIT NO TOXICITY.

(1) PLASTIC FACE PLATE: ACRYLIC SHEET PLASTIC PER MIL-P-5425, FINISH A.

(2) CASE: ALUMINUM ALLOY.

C. FINISHES:

(1) ALUMINUM CASE: CHROMATE TREAT PER MIL-C-5541.

(2) PAINT SURFACES MARKED "A" AND TOP BORDER AREA GREY EPOXY ENAMEL PER ND1002279 USING 1008809-1

(3) FINAL COAT SURFACES MARKED "A" PER ND1002277 USING 1012543-003

D. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND 1002136.

E. PANEL COLORS: [REF NOTE 2.A.(4)] YELLOW COLOR TO BE AVIATION YELLOW AND WHITE COLOR TO BE AVIATION WHITE PER MIL-C-25050. COLOR COORDINATES SHALL REMAIN WITHIN THE LIMITS OF THE SPECIFIED AVIATION COLORS WHEN ENERGIZED FROM 5.0 THRU 3.0 VDC. THE X - COORDINATE FOR THE AVIATION WHITE DISPLAYS SHALL NOT EXCEED X = .560 WHEN ENERGIZED FROM 5.0 THRU 2.0 VDC.

F. LAMPS: EACH OF THE 10 LEGEND AREAS SHALL BE ILLUMINATED BY 3 LAMPS, PARALLEL WIRED AS SHOWN IN THE SCHEMATIC. YELLOW DISPLAY LAMPS TO BE MS 24367-680. WHITE DISPLAY LAMPS TO BE MS 24367-713.

G. WHEN MOUNTED ON A SUITABLE FIXTURE, THE UNIT SHALL BE CAPABLE OF WITHSTANDING A PRESSURE OF 15 PSIA OF HELIUM, APPLIED AGAINST THE 32/ AREA, WHEN THE EXTERNAL PRESSURE IS REDUCED TO 1" HG EQUIVALENT PRESSURE; WHEN SUBJECTED TO THIS DIFFERENTIAL PRESSURE, THE UNIT SHALL EXHIBIT A LEAK RATE OF NO MORE THAN 1×10^{-5} ATM CC/SEC OVER THE TEMPERATURE RANGE OF -10°C TO +82°C.

4. NOTE: THIS UNIT IS TO BE MOUNTED ON A HEAT SINK WHEN LEGENDS ARE ENERGIZED FOR PERIODS LONGER THAN TWO (2) MINUTES. A SATISFACTORY HEAT SINK CAN BE AN ALUMINUM OR BRASS PLATE 10" X 10" X 1/8" WITH A CENTERED RECTANGULAR OPENING FOR MOUNTING THE UNIT.

MASTER

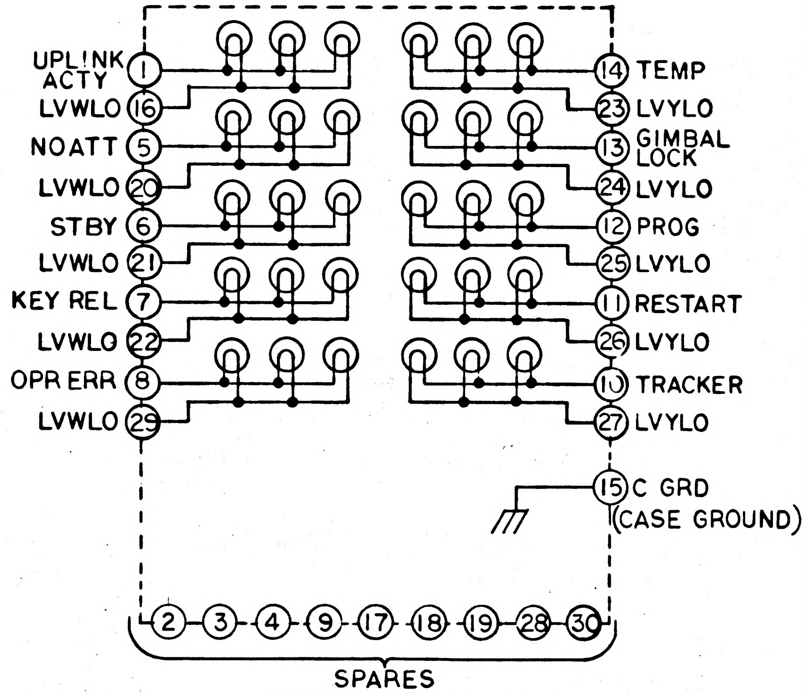

FIGURE 1 - SCHEMATIC

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong	17NOV65
CHECKED	J. [illegible]	22 NOV65
APPROVED		
APPROVED	Ellen C Hall	14 Dec 65
APPROVED MIT	A. C. METZGER	14 Dec 65
APPROVED MSC		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387

SCALE NONE
SHEET 2 OF 3

1006387 B

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006387 B

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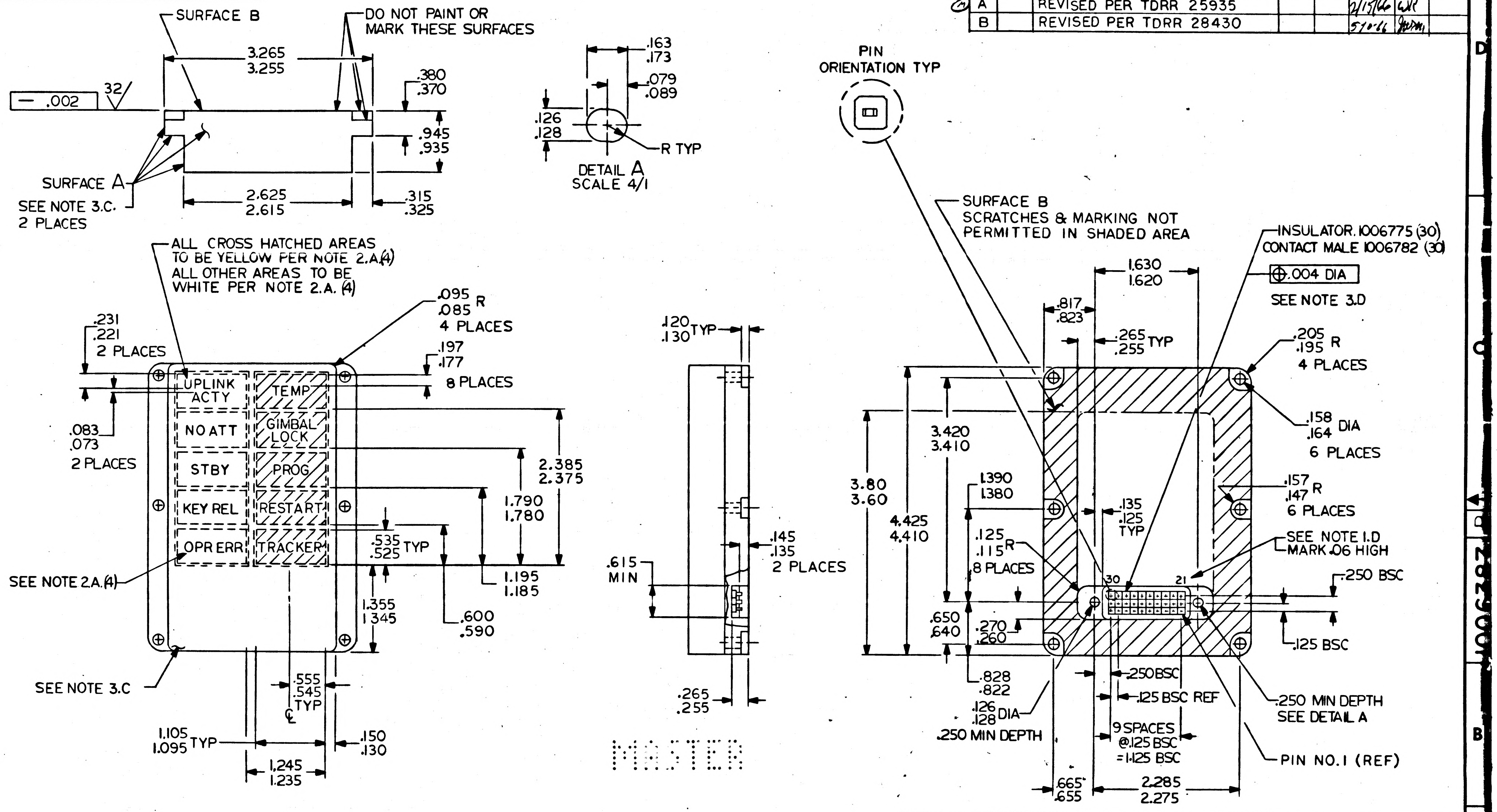
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			2/15/66	
B		REVISED PER TDRR 28430			5/10-66	


4
3
2
1
D
C
B
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SURFACE B
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.128
R TYP
DETAIL A
SCALE 4/1
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SURFACE B
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INSULATOR 1006775 (30)
CONTACT MALE 1006782 (30)
⊕ .004 DIA
SEE NOTE 3.D
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ALL OTHER AREAS TO BE WHITE PER NOTE 2.A. (4)
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RESTART
OPR ERR
TRACKER
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.073
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2.375
1.790
1.780
.535
.525 TYP
1.195
1.185
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.590
1.355
1.345
SEE NOTE 2.A.(4)
SEE NOTE 3.C
.555
.545
TYP
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1.105
1.095 TYP
.150
.130
1.245
1.235
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.615 MIN
.145
.135
2 PLACES
.265
.255
MASTER
1.630
1.620
.817
.823
.265
.255 TYP
.205
.195 R
4 PLACES
.158
.164 DIA
6 PLACES
3.420
3.410
3.80
3.60
4.425
4.410
1.390
1.380
.135
.125
TYP
.157
.147 R
6 PLACES
SEE NOTE 1.D
MARK .06 HIGH
.125
.115 R
8 PLACES
30
21
.250 BSC
.650
.640
.270
.260
.125 BSC
.828
.822
.250 BSC
.125 BSC REF
.126
.128 DIA
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SEE DETAIL A
9 SPACES
@.125 BSC
=1.125 BSC
PIN NO.1 (REF)
.665
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2.275

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CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN Jim Doty 19 Nov 65
CHECKED 22 NOV 65
APPROVED
APPROVED Eldon C Hall 14 Dec 65
APPROVED MIT 14 Dec 65
APPROVED MSC A.C. METZGER
DATE

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387

SCALE NONE
SHEET 3 OF 3

1006387

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SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
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A		REVISED PER TDRR 25935			2/15/66	WJR	
B		REVISED PER TDRR 28430	WFH		5/0/66		
C		REVISED PER TDRR 32577	AF	DW	13JAN67		

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056.

   D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.

   E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100%)

   A. MECHANICAL AND PHYSICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) SURFACE ROUGHNESS: $^{125}\surd$ UNLESS OTHERWISE SPECIFIED.

      (3) MARKING: AS SPECIFIED IN NOTES 1.D. AND 1.E. NO MARKING SHALL APPEAR ON THE $^{32}\surd$ AREA.

      (4) PANEL COLOR AND MARKING:

         COLOR, ENERGIZED: CROSS HATCHED LEGEND AREAS TO BE YELLOW, ALL OTHER LEGEND AREAS TO BE WHITE.

         COLOR, UNENERGIZED: LEGEND BACKGROUND TO BE LOW REFLECTIVE, DIFFUSE, NEUTRAL GREY WHEN NOT ENERGIZED. CONTRAST BETWEEN BLACK CHARACTERS AND UNLIGHTED BACKGROUND SHALL BE BETWEEN 2 TO 4 UNITS IN ACCORDANCE WITH MIL-P-7788.

         SURFACE GLOSS: THE DISPLAY AREAS SHALL HAVE A SURFACE GLOSS OF 5 UNITS OR LESS AS MEASURED PER MIL-P-7788 WHEN IN THE UNENERGIZED CONDITION.

         MARKING, LEGEND: LEGENDS SHALL BE AS SHOWN ON DRAWING. CHARACTERS SHALL BE GORTON CONDENSED WITH PROPORTIONS PER ND 1002122, TYPE II, CLASS 2. THE OVERALL HEIGHT OF CHARACTERS SHALL BE .156. THE LINE STROKE WIDTH SHALL BE .025/.030. LEGEND SHALL BE CENTERED ON DISPLAY FACE PLATE. FILL SHALL BE BLACK COLOR NO. 37038 PER FED-STD-595 AND SHALL BE OPAQUE WHEN LEGEND IS ENERGIZED.

      (5) BRIGHTNESS: LEGEND BACKGROUNDS SHALL HAVE A BRIGHTNESS LEVEL OF 15 ± 3 FOOT-LAMBERTS AT 5.0 ± .05 VDC. THE LEGENDS MUST BE READABLE (WHEN ILLUMINATED) UNDER AN AMBIENT 50 FOOT CANDLE ILLUMINATION.

      (6) ISOLATION: THERE SHALL BE NO LIGHT LEAKAGE FROM LIT TO UNLIT LEGEND AREAS. PAINT SHALL NOT BE DEEMED AN ADEQUATE LIGHT BLOCK.

   B. ELECTRICAL CHARACTERISTICS:

      (1) POWER DISSIPATION:

         YELLOW DISPLAYS: 0.180 AMPERES ± 15% AT 5.0 ± 0.1 VDC.

         WHITE DISPLAYS: 0.225 AMPERES ± 15% AT 5.0 ± 0.1 VDC

      (2) DIELECTRIC WITHSTANDING VOLTAGE: 200 ± 25 VRMS AT 60 CPS FOR 5 SECONDS BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND THE CASE PER MIL-STD-202, METHOD 301.

      (3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 100 VDC AT SEA LEVEL, 70° ± 10°F, 50% RH MAXIMUM, BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND CASE PER MIL-STD-202, METHOD 302.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

DASH NO.	APPLICABLE NOTES
-002	1 THRU 4 EXCEPT 3.C.(3)
-001	1 THRU 4 EXCEPT 3.C.(4)
-000	1 THRU 4 EXCEPT 3.C.(3) & 3.C.(4)

NOTE APPLICATION

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. Wong 17NOV65
CHECKED J. Y 22NOV65
APPROVED
APPROVED Eldon C Hall 14Dec65
APPROVED MIT A. C. METZGER 14Dec65
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006387
SCALE NONE
SHEET 1 OF 3

MODERN BLUE PRINT CO. D-19550

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REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			3/18/66	WR
B		REVISED PER TDRR 28430			5-10-66	
C		REVISED PER TDRR 32577	AF	DW	13JAN67	

REQUIREMENTS: (CONTINUED)

3. DESIGN:

A. OPERATING LIFE: 4000 HOURS MINIMUM AT POWER DISSIPATION PER NOTE 2.B.(1) AT 70° ± 10°F AMBIENT TEMPERATURE.

B. MATERIAL: ALL MATERIAL SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF THIS DRAWING AND EXHIBIT NO TOXICITY.

(1) PLASTIC FACE PLATE: ACRYLIC SHEET PLASTIC PER MIL-P-5425, FINISH A.

(2) CASE: ALUMINUM ALLOY.

C. FINISHES:

(1) ALUMINUM CASE: CHROMATE TREAT PER MIL-C-5541.

(2) PAINT SURFACES MARKED "A" AND TOP BORDER AREA (EXCLUDING THE SURFACE OF PANELS) GREY EPOXY ENAMEL PER ND 1002279 USING 1008809-1

(3) FINAL COAT SURFACES MARKED "A" PER ND1002277 USING 1012543-003

(4) FINAL COAT SURFACES MARKED "A" AND TOP BORDER AREA (EXCLUDING THE SURFACE OF PANELS) PER ND1002277 USING 1012543-003.

D. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND 1002136.

E. PANEL COLORS: [REF NOTE 2.A.(4)] YELLOW COLOR TO BE AVIATION YELLOW AND WHITE COLOR TO BE AVIATION WHITE PER MIL-C-25050. COLOR COORDINATES SHALL REMAIN WITHIN THE LIMITS OF THE SPECIFIED AVIATION COLORS WHEN ENERGIZED FROM 5.0 THRU 3.0 VDC. THE X - COORDINATE FOR THE AVIATION WHITE DISPLAYS SHALL NOT EXCEED X = .560 WHEN ENERGIZED FROM 5.0 THRU 2.0 VDC.

F. LAMPS: EACH OF THE 10 LEGEND AREAS SHALL BE ILLUMINATED BY 3 LAMPS, PARALLEL WIRED AS SHOWN IN THE SCHEMATIC. YELLOW DISPLAY LAMPS TO BE MS 24367-680. WHITE DISPLAY LAMPS TO BE MS 24367-713.

G. WHEN MOUNTED ON A SUITABLE FIXTURE, THE UNIT SHALL BE CAPABLE OF WITHSTANDING A PRESSURE OF 15 PSIA OF HELIUM, APPLIED AGAINST THE 32/ AREA, WHEN THE EXTERNAL PRESSURE IS REDUCED TO 1" HG EQUIVALENT PRESSURE; WHEN SUBJECTED TO THIS DIFFERENTIAL PRESSURE, THE UNIT SHALL EXHIBIT A LEAK RATE OF NO MORE THAN 1×10^{-5} ATM CC/SEC OVER THE TEMPERATURE RANGE OF -10°C TO +82°C.

4. NOTE: THIS UNIT IS TO BE MOUNTED ON A HEAT SINK WHEN LEGENDS ARE ENERGIZED FOR PERIODS LONGER THAN TWO (2) MINUTES. A SATISFACTORY HEAT SINK CAN BE AN ALUMINUM OR BRASS PLATE 10" X 10" X 1/8" WITH A CENTERED RECTANGULAR OPENING FOR MOUNTING THE UNIT.

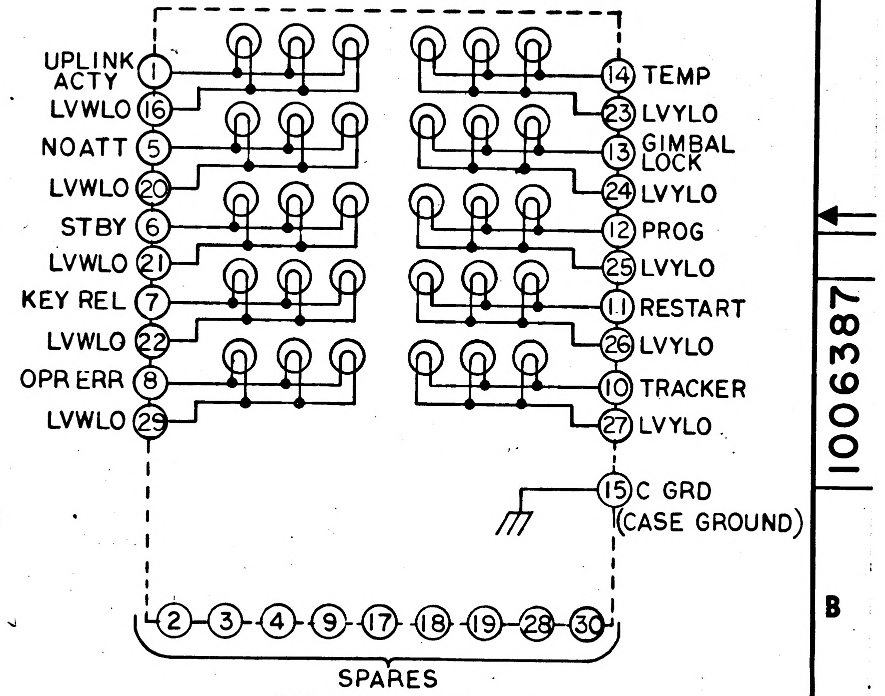


FIGURE 1 - SCHEMATIC

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong	17NOV65
CHECKED	J. Yon	22NOV65
APPROVED		
APPROVED	Ellen C. Hall	14Dec65
APPROVED MIT	A. C. METZGER	14Dec65
APPROVED MSC		
	DATE	

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387
SCALE NONE		SHEET 2 OF 3

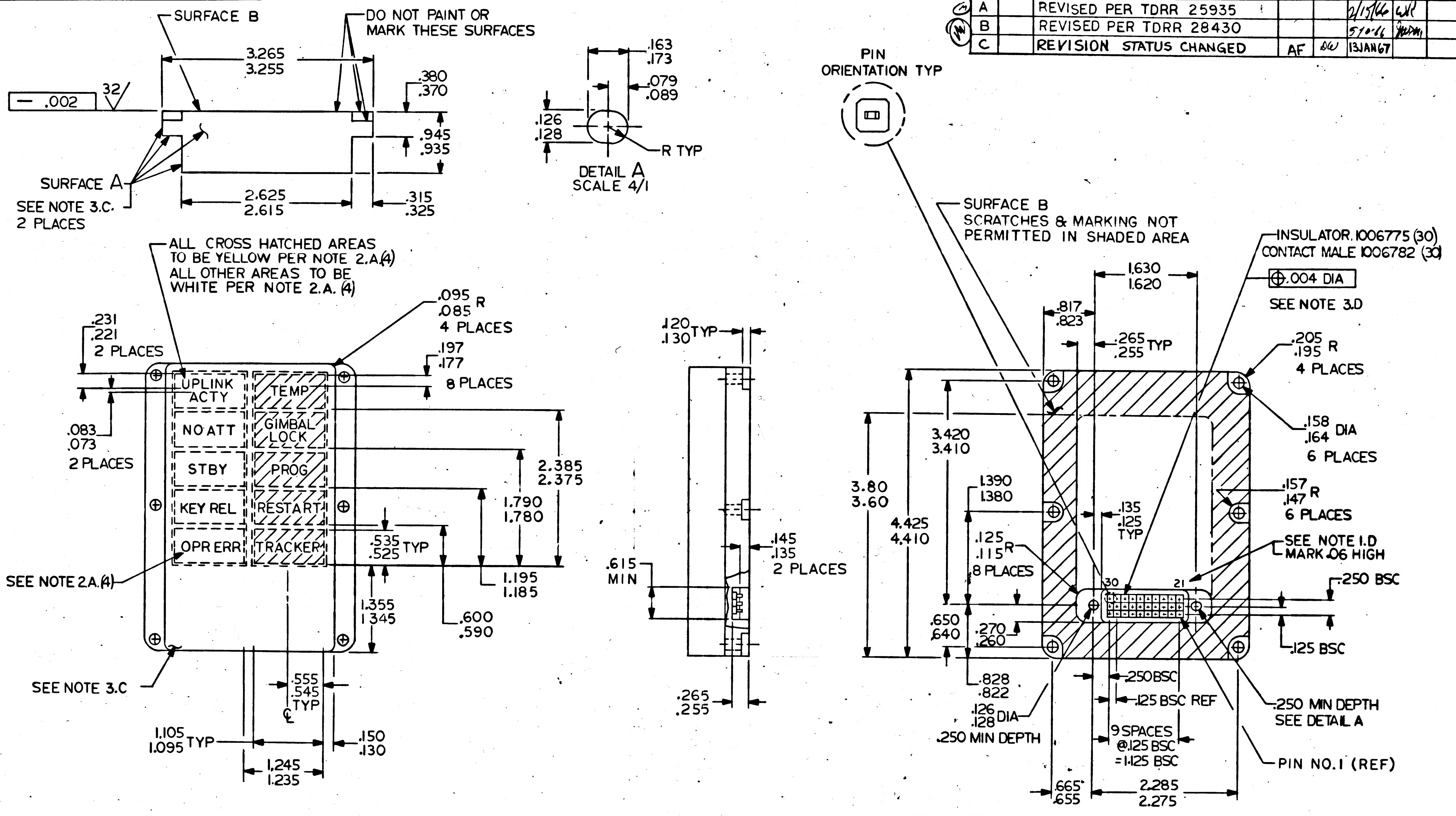
MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006387 C

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			2/15/66	
B		REVISED PER TDRR 28430			5-10-66	
C		REVISION STATUS CHANGED	AF	DW	13JAN67	


SURFACE B
DO NOT PAINT OR MARK THESE SURFACES
3.265
3.255
.380
.370
— .002
32
.945
.935
SURFACE A
SEE NOTE 3.C.
2 PLACES
2.625
2.615
.315
.325
.163
.173
.079
.089
.126
.128
R TYP
DETAIL A
SCALE 4/1
PIN ORIENTATION TYP
ALL CROSS HATCHED AREAS TO BE YELLOW PER NOTE 2.A.(4)
ALL OTHER AREAS TO BE WHITE PER NOTE 2.A. (4)
.231
.221
2 PLACES
.095
.085 R
4 PLACES
.197
.177
8 PLACES
UPLINK ACTY
TEMP
NO ATT
GIMBAL LOCK
STBY
PROG
KEY REL
RESTART
OPR ERR
TRACKER
.083
.073
2 PLACES
2.385
2.375
1.790
1.780
.535
.525 TYP
1.195
1.185
SEE NOTE 2.A.(4)
1.355
1.345
.600
.590
SEE NOTE 3.C
.555
.545
TYP
℄
1.105
1.095 TYP
.150
.130
1.245
1.235
.120
.130 TYP
.145
.135
2 PLACES
.615 MIN
.265
.255
SURFACE B
SCRATCHES & MARKING NOT PERMITTED IN SHADED AREA
INSULATOR 1006775 (30)
CONTACT MALE 1006782 (30)
⌖ .004 DIA
SEE NOTE 3.D
1.630
1.620
.817
.823
.265
.255 TYP
.205
.195 R
4 PLACES
.158
.164 DIA
6 PLACES
3.420
3.410
3.80
3.60
4.425
4.410
1.390
1.380
.135
.125
TYP
.157
.147 R
6 PLACES
.125
.115 R
8 PLACES
SEE NOTE 1.D
MARK .06 HIGH
30
21
.250 BSC
.650
.640
.270
.260
.125 BSC
.828
.822
.250 BSC
.125 BSC REF
.126
.128 DIA
.250 MIN DEPTH
.250 MIN DEPTH
SEE DETAIL A
9 SPACES @.125 BSC =1.125 BSC
PIN NO.1 (REF)
.665
.655
2.285
2.275

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	Jim Doty	19Nov65
CHECKED	J. Yor	22NOV65
APPROVED		
APPROVED	Eldon C Hall	14Dec65
APPROVED MIT	W Kupfer	14Dec65
APPROVED MSC	A.C. METZGER	DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387

SCALE NONE

SHEET 3 OF 3

1006387

MODERN BLUE PRINT CO. D-19550

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1006387 D

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			2/15/66	W/R
B		REVISED PER TDRR 28430	WFH		5/10/66	
C		REVISED PER TDRR 32577	AF	DW	13JAN67	
D		REVISED PER TDRR 32719	LL	J.W.	26JAN67	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056.

D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100%)

A. MECHANICAL AND PHYSICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) SURFACE ROUGHNESS: 125√ UNLESS OTHERWISE SPECIFIED.

(3) MARKING: AS SPECIFIED IN NOTES 1.D. AND 1.E. NO MARKING SHALL APPEAR ON THE 32√ AREA.

(4) PANEL COLOR AND MARKING:

COLOR, ENERGIZED: CROSS HATCHED LEGEND AREAS TO BE YELLOW, ALL OTHER LEGEND AREAS TO BE WHITE.

COLOR, UNENERGIZED: LEGEND BACKGROUND TO BE LOW REFLECTIVE, DIFFUSE, NEUTRAL GREY WHEN NOT ENERGIZED. CONTRAST BETWEEN BLACK CHARACTERS AND UNLIGHTED BACKGROUND SHALL BE BETWEEN 2 TO 4 UNITS IN ACCORDANCE WITH MIL-P-7788.

SURFACE GLOSS: THE DISPLAY AREAS SHALL HAVE A SURFACE GLOSS OF 5 UNITS OR LESS AS MEASURED PER MIL-P-7788 WHEN IN THE UNENERGIZED CONDITION.

MARKING, LEGEND: LEGENDS SHALL BE AS SHOWN ON DRAWING. CHARACTERS SHALL BE GORTON CONDENSED WITH PROPORTIONS PER ND 1002122, TYPE II, CLASS 2. THE OVERALL HEIGHT OF CHARACTERS SHALL BE .156. THE LINE STROKE WIDTH SHALL BE .025/.030. LEGEND SHALL BE CENTERED ON DISPLAY FACE PLATE. FILL SHALL BE BLACK COLOR NO. 37038 PER FED-STD-595 AND SHALL BE OPAQUE WHEN LEGEND IS ENERGIZED.

(5) BRIGHTNESS: LEGEND BACKGROUNDS SHALL HAVE A BRIGHTNESS LEVEL OF 15 ± 3 FOOT-LAMBERTS AT 5.0 ± .05 VDC THE LEGENDS MUST BE READABLE (WHEN ILLUMINATED) UNDER AN AMBIENT 50 FOOT CANDLE ILLUMINATION.

(6) ISOLATION: THERE SHALL BE NO LIGHT LEAKAGE FROM LIT TO UNLIT LEGEND AREAS. PAINT SHALL NOT BE DEEMED AN ADEQUATE LIGHT BLOCK.

B. ELECTRICAL CHARACTERISTICS:

(1) POWER DISSIPATION:

YELLOW DISPLAYS: 0.180 AMPERES ± 15% AT 5.0 ± 0.1 VDC.

WHITE DISPLAYS: 0.225 AMPERES ± 15% AT 5.0 ± 0.1 VDC

(2) DIELECTRIC WITHSTANDING VOLTAGE: 200 ± 25 VRMS AT 60 CPS FOR 5 SECONDS BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND THE CASE PER MIL-STD-202, METHOD 301.

(3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 100 VDC AT SEA LEVEL, 70° ± 10°F, 50% RH MAXIMUM, BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND CASE PER MIL-STD-202, METHOD 302.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

DASH NO.	APPLICABLE NOTES
-003	1 THRU 6 EXCEPT 3.C.(3)
-002	1 THRU 4 EXCEPT 3,C.(3)
-001	1 THRU 4 EXCEPT 3,C.(4)
-000	1 THRU 4 EXCEPT 3.C.(3) & 3.C.(4)

NOTE APPLICATION

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN W. Wong 17NOV65
CHECKED J. [illegible] 22NOV65
APPROVED
APPROVED Eldon C Hall 14 Dec 65
APPROVED MIT A. C. METZGER 14 Dec 65
APPROVED MSC
DATE

INDICATOR, ALARM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006387
SCALE NONE
SHEET 1 OF 3

1006387

MODERN BLUE PRINT CO. D-19550

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1006387 D

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	
A		REVISED PER TDRR 25935			[illegible]	WK
B		REVISED PER TDRR 28430			5-10-66	[illegible]
C		REVISED PER TDRR 32577	AF	Bw	13JAN67	
D		REVISED PER TDRR 32719	LL	[illegible]	26JAN67	

REQUIREMENTS: (CONTINUED)

3. DESIGN:

A. OPERATING LIFE: 4000 HOURS MINIMUM AT POWER DISSIPATION PER NOTE 2.B.(1) AT 70° ± 10°F AMBIENT TEMPERATURE.

B. MATERIAL: ALL MATERIAL SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF THIS DRAWING AND EXHIBIT NO TOXICITY.

(1) PLASTIC FACE PLATE: ACRYLIC SHEET PLASTIC PER MIL-P-5425, FINISH A.

(2) CASE: ALUMINUM ALLOY.

C. FINISHES:

(1) ALUMINUM CASE: CHROMATE TREAT PER MIL-C-5541.

(2) PAINT SURFACES MARKED "A" AND TOP BORDER AREA (EXCLUDING THE SURFACE OF PANELS) GREY EPOXY ENAMEL PER ND 1002279 USING 1008809-1

(3) FINAL COAT SURFACES MARKED "A" PER ND1002277 USING 1012543-003

(4) FINAL COAT SURFACES MARKED "A" AND TOP BORDER AREA (EXCLUDING THE SURFACE OF PANELS) PER ND1002277 USING 1012543-003.

D. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND 1002136.

E. PANEL COLORS: [REF NOTE 2.A.(4)] YELLOW COLOR TO BE AVIATION YELLOW AND WHITE COLOR TO BE AVIATION WHITE PER MIL-C-25050. COLOR COORDINATES SHALL REMAIN WITHIN THE LIMITS OF THE SPECIFIED AVIATION COLORS WHEN ENERGIZED FROM 5.0 THRU 3.0 VDC. THE X - COORDINATE FOR THE AVIATION WHITE DISPLAYS SHALL NOT EXCEED X = .560 WHEN ENERGIZED FROM 5.0 THRU 2.0 VDC.

F. LAMPS: EACH OF THE 10 LEGEND AREAS SHALL BE ILLUMINATED BY 3 LAMPS, PARALLEL WIRED AS SHOWN IN THE SCHEMATIC. YELLOW DISPLAY LAMPS TO BE MS 24367-680. WHITE DISPLAY LAMPS TO BE MS 24367-713.

G. WHEN MOUNTED ON A SUITABLE FIXTURE, THE UNIT SHALL BE CAPABLE OF WITHSTANDING A PRESSURE OF 15 PSIA OF HELIUM, APPLIED AGAINST THE 32 AREA, WHEN THE EXTERNAL PRESSURE IS REDUCED TO 1" HG EQUIVALENT PRESSURE; WHEN SUBJECTED TO THIS DIFFERENTIAL PRESSURE, THE UNIT SHALL EXHIBIT A LEAK RATE OF NO MORE THAN 1×10^{-5} ATM CC/SEC OVER THE TEMPERATURE RANGE OF -10°C TO +82°C.

4. NOTE: THIS UNIT IS TO BE MOUNTED ON A HEAT SINK WHEN LEGENDS ARE ENERGIZED FOR PERIODS LONGER THAN TWO (2) MINUTES. A SATISFACTORY HEAT SINK CAN BE AN ALUMINUM OR BRASS PLATE 10" X 10" X 1/8" WITH A CENTERED RECTANGULAR OPENING FOR MOUNTING THE UNIT.

5. CONSTRUCTION: (-003 ONLY)

A. BULBS TO BE USED SHALL MEET THE REQUIREMENTS OF MS 24367, AND SHALL BE SCREENED FOR THE FOLLOWING DEFECTS:

(1) SURFACE CRACKS.

(2) SCRATCHES AND TOOL MARKS.

(3) RAW UNPOLISHED GLASS EDGES IN FINAL SEAL AREA

BULBS WHICH EXHIBIT THESE DEFECTS SHALL NOT BE USED IN DISPLAYS SUPPLIED TO THIS SPECIFICATION.

REQUIREMENTS CONT.

B. BULBS SHALL BE CONFORMALLY COATED WITH A SOFT SETTING PLASTIC BEFORE EMBEDDMENT TO RELIEVE POTTING STRESS ON BULBS. THE PLASTIC AND/OR SOLVENTS SHALL BE APPROVED BY RAYTHEON RELIABILITY.

6. VENDOR SUPPLIED DOCUMENTATION: THE VENDOR SHALL RECORD AND SUPPLY CERTIFICATES OF COMPLIANCE FOR THE FOLLOWING READINGS ON EACH DISPLAY.

A. BRIGHTNESS PER PARA 2.A.(5)

B. POWER DISSIPATION PER PARA 2.B.(1)

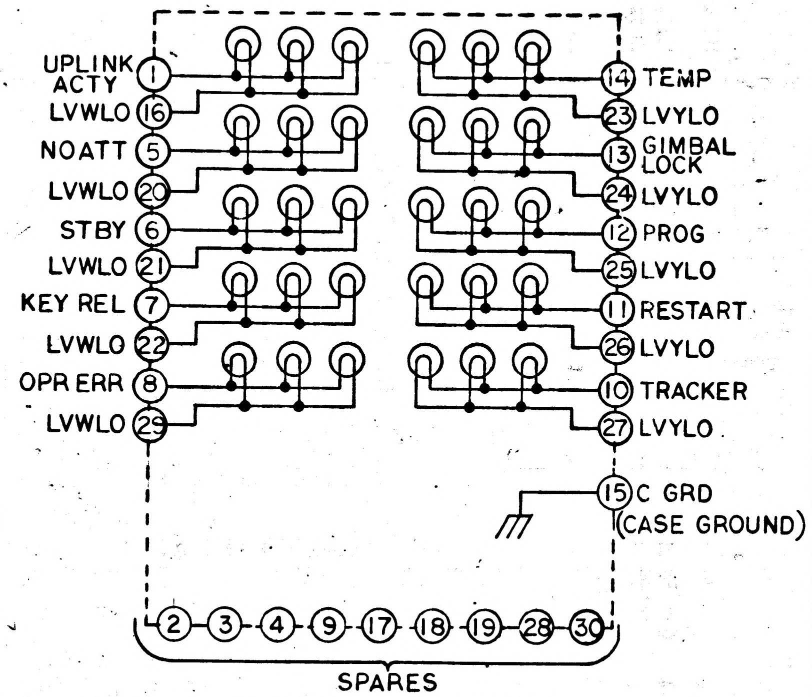


FIGURE 1 - SCHEMATIC

1006387

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN H. Wong 17NOV65
CHECKED J. [illegible] 22NOV65
APPROVED
APPROVED Ellen C Hall 14Dec65
APPROVED MIT W Kupfer 14Dec65
A. C. METZGER
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006387
SCALE NONE
SHEET 2 OF 3

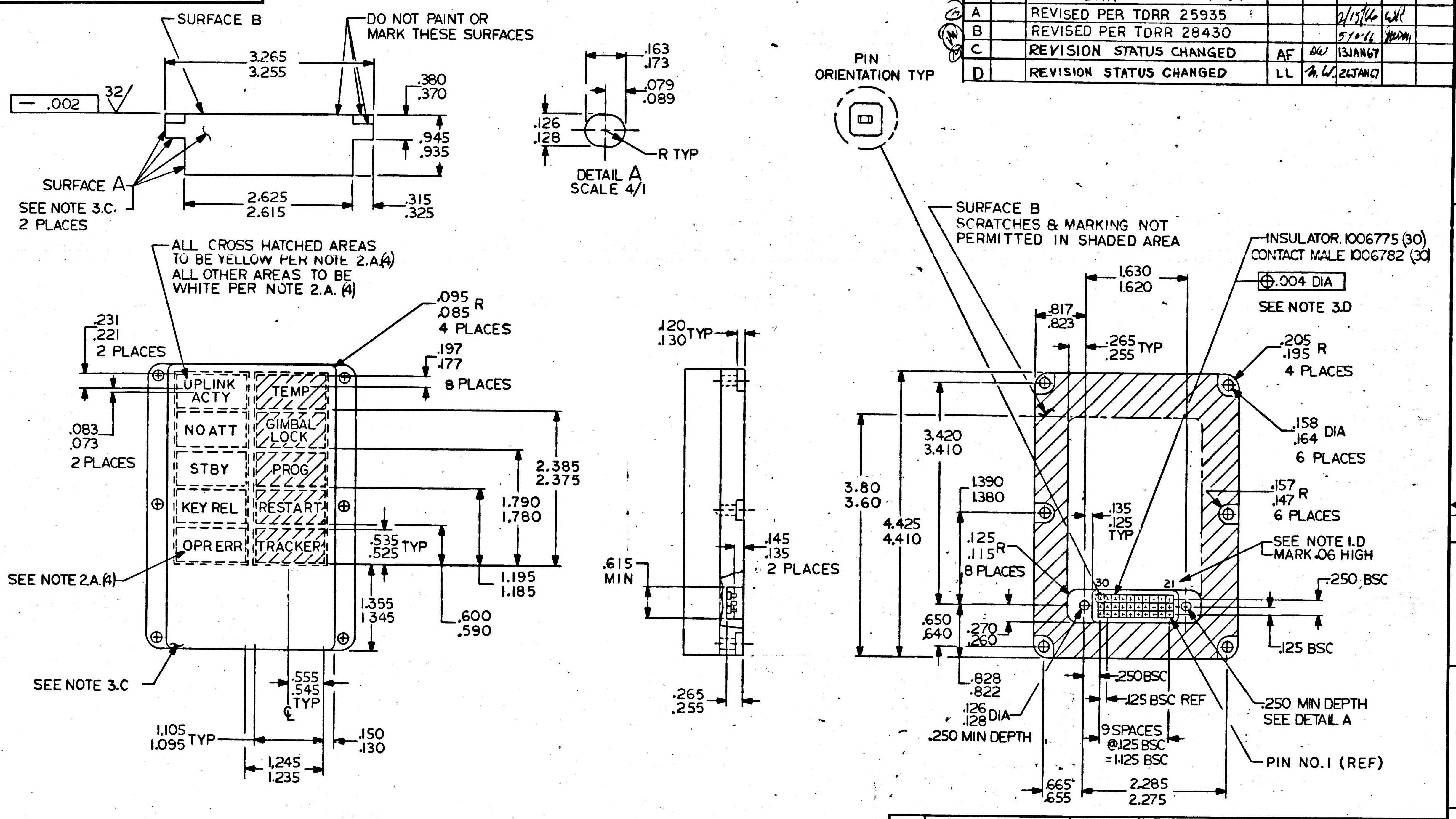
MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006387 D

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65		
A		REVISED PER TDRR 25935			2/15/66		
B		REVISED PER TDRR 28430			5-10-66		
C		REVISION STATUS CHANGED	AF	DW	13JAN67		
D		REVISION STATUS CHANGED	LL	M. W.	26JAN67		


SURFACE B
DO NOT PAINT OR MARK THESE SURFACES
3.265
3.255
.380
.370
— .002
32
.945
.935
SURFACE A
SEE NOTE 3.C.
2 PLACES
2.625
2.615
.315
.325
.163
.173
.079
.089
.126
.128
R TYP
DETAIL A
SCALE 4/1
PIN ORIENTATION TYP
SURFACE B
SCRATCHES & MARKING NOT PERMITTED IN SHADED AREA
ALL CROSS HATCHED AREAS TO BE YELLOW PER NOTE 2.A.(4)
ALL OTHER AREAS TO BE WHITE PER NOTE 2.A.(4)
.095
.085 R
4 PLACES
.231
.221
2 PLACES
.197
.177
8 PLACES
UPLINK ACTY
TEMP
NO ATT
GIMBAL LOCK
STBY
PROG
KEY REL
RESTART
OPR ERR
TRACKER
.083
.073
2 PLACES
2.385
2.375
1.790
1.780
.535
.525 TYP
SEE NOTE 2.A.(4)
1.195
1.185
1.355
1.345
.600
.590
SEE NOTE 3.C
.555
.545
TYP
℄
1.105
1.095 TYP
.150
.130
1.245
1.235
.120
.130 TYP
.145
.135
2 PLACES
.615
MIN
.265
.255
INSULATOR 1006775 (30)
CONTACT MALE 1006782 (30)
⊕ .004 DIA
SEE NOTE 3.D
1.630
1.620
.817
.823
.265
.255 TYP
.205
.195 R
4 PLACES
.158
.164 DIA
6 PLACES
3.420
3.410
3.80
3.60
4.425
4.410
1.390
1.380
.157
.147 R
6 PLACES
.135
.125
TYP
.125
.115 R
8 PLACES
SEE NOTE 1.D
MARK .06 HIGH
30
21
.250 BSC
.650
.640
.270
.260
.125 BSC
.828
.822
.250 BSC
.125 BSC REF
.126
.128 DIA
.250 MIN DEPTH
.250 MIN DEPTH
SEE DETAIL A
9 SPACES
@ .125 BSC
= 1.125 BSC
PIN NO. 1 (REF)
.665
.655
2.285
2.275

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Jim Doty 19Nov65
CHECKED 22NOV65
APPROVED
APPROVED Eldon C Hall 14Dec65
APPROVED MIT W Kupfer 14Dec65
APPROVED MSC A.C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006387
SCALE NONE
SHEET 3 OF 3

1006387

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006387

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND 1002056.

   D. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.

   E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100%)

   A. MECHANICAL AND PHYSICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) SURFACE ROUGHNESS: 125√ UNLESS OTHERWISE SPECIFIED.

      (3) MARKING: AS SPECIFIED IN NOTES 1.D. AND 1.E. NO MARKING SHALL APPEAR ON THE 32√ AREA.

      (4) PANEL COLOR AND MARKING:

         COLOR, ENERGIZED: CROSS HATCHED LEGEND AREAS TO BE YELLOW, ALL OTHER LEGEND AREAS TO BE WHITE.

         COLOR, UNENERGIZED: LEGEND BACKGROUND TO BE LOW REFLECTIVE, DIFFUSE, NEUTRAL GREY WHEN NOT ENERGIZED. CONTRAST BETWEEN BLACK CHARACTERS AND UNLIGHTED BACKGROUND SHALL BE BETWEEN 2 TO 4 UNITS IN ACCORDANCE WITH MIL-P-7788.

         SURFACE GLOSS: THE DISPLAY AREAS SHALL HAVE A SURFACE GLOSS OF 5 UNITS OR LESS AS MEASURED PER MIL-P-7788 WHEN IN THE UNENERGIZED CONDITION.

         MARKING, LEGEND: LEGENDS SHALL BE AS SHOWN ON DRAWING. CHARACTERS SHALL BE GORTON CONDENSED WITH PROPORTIONS PER ND 1002122, TYPE II, CLASS 2. THE OVERALL HEIGHT OF CHARACTERS SHALL BE .156. THE LINE STROKE WIDTH SHALL BE .025/.030. LEGEND SHALL BE CENTERED ON DISPLAY FACE PLATE. FILL SHALL BE BLACK COLOR NO. 37038 PER FED-STD-595 AND SHALL BE OPAQUE WHEN LEGEND IS ENERGIZED.

      (5) BRIGHTNESS: LEGEND BACKGROUNDS SHALL HAVE A BRIGHTNESS LEVEL OF 15 ± 3 FOOT-LAMBERTS AT 5.0 ± .05 VDC THE LEGENDS MUST BE READABLE (WHEN ILLUMINATED) UNDER AN AMBIENT 50 FOOT CANDLE ILLUMINATION.

      (6) ISOLATION: THERE SHALL BE NO LIGHT LEAKAGE FROM LIT TO UNLIT LEGEND AREAS. PAINT SHALL NOT BE DEEMED AN ADEQUATE LIGHT BLOCK.

   B. ELECTRICAL CHARACTERISTICS:

      (1) POWER DISSIPATION:

         YELLOW DISPLAYS: 0.180 AMPERES ± 15% AT 5.0 ± 0.1 VDC.

         WHITE DISPLAYS: 0.225 AMPERES ± 15% AT 5.0 ± 0.1 VDC

      (2) DIELECTRIC WITHSTANDING VOLTAGE: 200 ± 25 VRMS AT 60 CPS FOR 5 SECONDS BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND THE CASE PER MIL-STD-202, METHOD 301.

      (3) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 100 VDC AT SEA LEVEL, 70° ± 10°F, 50% RH MAXIMUM, BETWEEN ADJACENT TERMINALS AND BETWEEN ANY TERMINAL AND CASE PER MIL-STD-202, METHOD 302.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	H. Wong gms	17NOV65
CHECKED	J. Yon HSM	22NOV65
APPROVED		
APPROVED	Eldon C Hall	14Dec65
APPROVED MIT	A. C. METZGER	14Dec65
APPROVED MSC		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387
SCALE NONE		SHEET 1 OF 3

1006387

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006387

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24677			12-14-65	

REQUIREMENTS: (CONTINUED)

3. DESIGN:

A. OPERATING LIFE: 4000 HOURS MINIMUM AT POWER DISSIPATION PER NOTE 2.B.(1) AT 70° ± 10°F AMBIENT TEMPERATURE.

B. MATERIAL: ALL MATERIAL SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF THIS DRAWING AND EXHIBIT NO TOXICITY.

(1) PLASTIC FACE PLATE: ACRYLIC SHEET PLASTIC PER MIL-P-5425, FINISH A.

(2) CASE: ALUMINUM ALLOY.

C. FINISHES:

(1) ALUMINUM CASE: CHROMATE TREAT PER MIL-C-5541.

(2) EXPOSED ACRYLIC SURFACES TO BE COATED WITH EPOXY RESIN PER SCD 1010657 USING CATALYST PER SCD 1010686. COATING TO BE SMOOTH AND UNIFORM. LEGEND AREA TO MEET THE REQUIREMENTS OF PARA 2.A.(4).

(3) PAINT SURFACES MARKED "A" BLACK EPOXY ENAMEL PER MIL-P-27316.

(4) PAINT TOP BORDER AREA MED GRAY EPOXY ENAMEL PER ND 1002110 USING 1010729-1.

D. TERMINALS AND INSULATORS: SHALL MEET THE REQUIREMENTS OF ND 1002136.

E. PANEL COLORS: [REF NOTE 2.A.(4)] YELLOW COLOR TO BE AVIATION YELLOW AND WHITE COLOR TO BE AVIATION WHITE PER MIL-C-25050. COLOR COORDINATES SHALL REMAIN WITHIN THE LIMITS OF THE SPECIFIED AVIATION COLORS WHEN ENERGIZED FROM 5.0 THRU 3.0 VDC. THE X - COORDINATE FOR THE AVIATION WHITE DISPLAYS SHALL NOT EXCEED X = .560 WHEN ENERGIZED FROM 5.0 THRU 2.0 VDC.

F. LAMPS: EACH OF THE 14 LEGEND AREAS SHALL BE ILLUMINATED BY 3 LAMPS, PARALLEL WIRED AS SHOWN IN THE SCHEMATIC. YELLOW DISPLAY LAMPS TO BE MS 24367-680. WHITE DISPLAY LAMPS TO BE MS 24367-713.

G. WHEN MOUNTED ON A SUITABLE FIXTURE, THE UNIT SHALL BE CAPABLE OF WITHSTANDING A PRESSURE OF 15 PSIA OF HELIUM, APPLIED AGAINST THE 32√ AREA, WHEN THE EXTERNAL PRESSURE IS REDUCED TO 1" HG EQUIVALENT PRESSURE; WHEN SUBJECTED TO THIS DIFFERENTIAL PRESSURE, THE UNIT SHALL EXHIBIT A LEAK RATE OF NO MORE THAN 8×10^{-6} ATM CC/SEC OVER THE TEMPERATURE RANGE OF -10°C TO +82°C.

4. NOTE: THIS UNIT IS TO BE MOUNTED ON A HEAT SINK WHEN LEGENDS ARE ENERGIZED FOR PERIODS LONGER THAN TWO (2) MINUTES. A SATISFACTORY HEAT SINK CAN BE AN ALUMINUM OR BRASS PLATE 10" X 10" X 1/8" WITH A CENTERED RECTANGULAR OPENING FOR MOUNTING THE UNIT.

MASTER

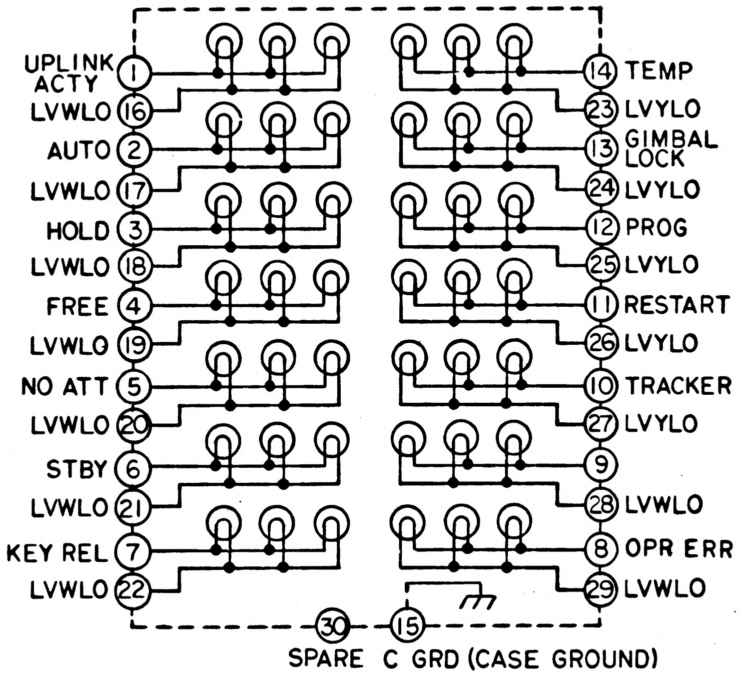

FIGURE 1 - SCHEMATIC

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

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RESISTOR VALUES ARE IN OHMS
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DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	H. Wong	17NOV65
CHECKED	J. [illegible]	22 NOV 65
APPROVED		
APPROVED	Ellen C Hall	14 Dec 65
APPROVED MIT	A. C. METZGER	14 Dec 65
APPROVED MSC		DATE

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006387

SCALE NONE
SHEET 2 OF 3

1006387 —

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REVISIONS

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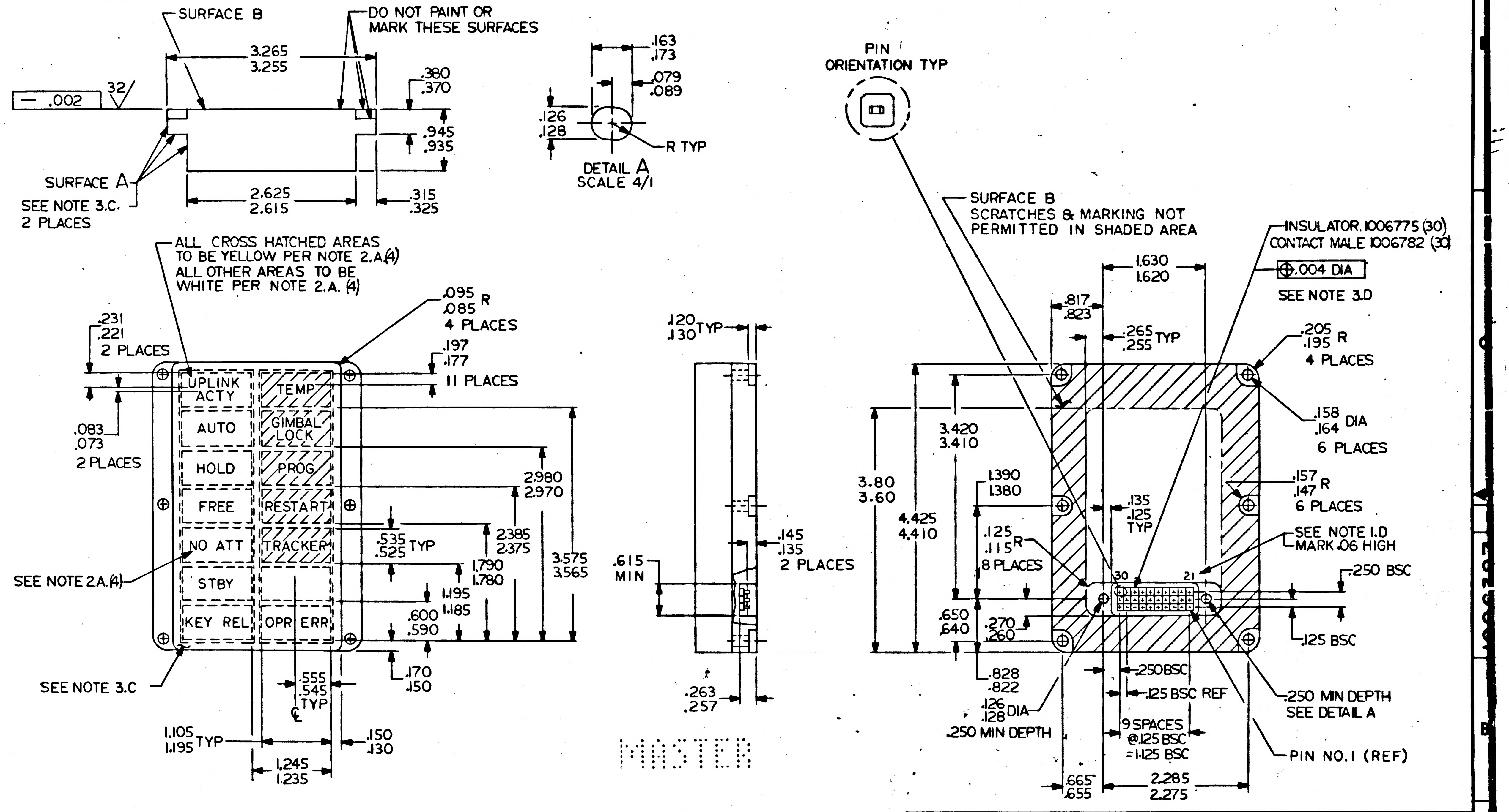
SURFACE B
DO NOT PAINT OR MARK THESE SURFACES
3.265
3.255
.380
.370
— .002
32
.945
.935
SURFACE A
SEE NOTE 3.C. 2 PLACES
2.625
2.615
.315
.325
.163
.173
.079
.089
.126
.128
R TYP
DETAIL A
SCALE 4/1
PIN ORIENTATION TYP
ALL CROSS HATCHED AREAS TO BE YELLOW PER NOTE 2.A.(4) ALL OTHER AREAS TO BE WHITE PER NOTE 2.A. (4)
.231
.221
2 PLACES
.095
.085
R
4 PLACES
.197
.177
11 PLACES
.083
.073
2 PLACES
UPLINK ACTY
TEMP
AUTO
GIMBAL LOCK
HOLD
PROG
FREE
RESTART
NO ATT
TRACKER
STBY
KEY REL
OPR ERR
2.980
2.970
2.385
2.375
.535
.525
TYP
1.790
1.780
3.575
3.565
1.195
1.185
.600
.590
SEE NOTE 2.A.(4)
SEE NOTE 3.C
.170
.150
.555
.545
TYP
℄
1.105
1.195
TYP
.150
.130
1.245
1.235
.120
.130
TYP
.615 MIN
.145
.135
2 PLACES
.263
.257
MASTER
SURFACE B
SCRATCHES & MARKING NOT PERMITTED IN SHADED AREA
INSULATOR 1006775 (30)
CONTACT MALE 1006782 (30)
⊕ .004 DIA
SEE NOTE 3.D
1.630
1.620
.817
.823
.265
.255
TYP
.205
.195
R
4 PLACES
.158
.164
DIA
6 PLACES
3.420
3.410
3.80
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4.425
4.410
1.390
1.380
.135
.125
TYP
.157
.147
R
6 PLACES
.125
.115
R
8 PLACES
SEE NOTE 1.D
MARK .06 HIGH
30
21
.250 BSC
.650
.640
.270
.260
.125 BSC
.828
.822
.250 BSC
.125 BSC REF
.126
.128
DIA
.250 MIN DEPTH
.250 MIN DEPTH
SEE DETAIL A
9 SPACES @.125 BSC =1.125 BSC
PIN NO.1 (REF)
.665
.655
2.285
2.275

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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DIMENSIONS ARE IN INCHES
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RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	Jim Doty	19 Nov 65
CHECKED		22 NOV 65
APPROVED		
APPROVED	Eldon C Hall	14 Dec 65
APPROVED MIT		14 Dec 65
APPROVED MSC	A.C. METZGER	
		DATE

INDICATOR, ALARM

SPECIFICATION CONTROL DRAWING

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80230	C	1006387
SCALE NONE		SHEET 3 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

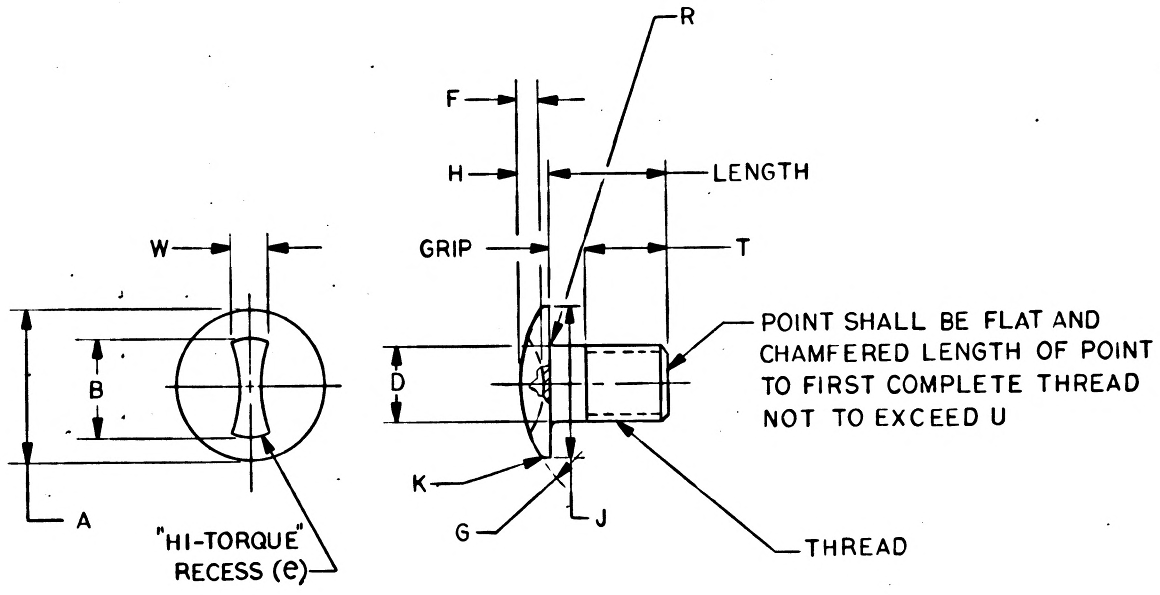
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE PER TDRR 27098			3-15-66	
A		① REVISED PER TDRR 31823	JRK	PBR	7 NOV 66	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. MARKING: AS SPECIFIED IN NOTE 1.C. ABOVE.
   - B. DIMENSIONS AND TOLERANCES: AS SPECIFIED.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:
   - A. MATERIAL AND FINISH: CORROSION AND HEAT RESISTANT STEEL PER AMS 5735 ALLOY A-286, PASSIVATED PER MIL-S-5002.



POINT SHALL BE FLAT AND CHAMFERED LENGTH OF POINT TO FIRST COMPLETE THREAD NOT TO EXCEED U

DASH NUMBER	THREAD	A DIA	B REF	D DIA	F	G RAD REF	H	J DIA MIN	R RAD	T (REF)	U	W REF	K	GRIP	LENGTH	MS33750 RECESS NUMBER (e)
-001	4-40 UNC-3A	.219 .205	.208	.1115 .1095	.047 .043	.300	.063 .059	.195	.010 .005	.175	.050	.084	.028 .020	.075±.020	.250±.031	#1
-002	8-32NC 3A	.312 .298	.260	.164 .1585	.061 .055	.440	.087 .083	.289	.015 .010	.295	.062	.090	.060 .050	.080 MAX.	.375±.015	#2

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON

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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN K.W. Simpson 22 FEB 1966
CHECKED Bob Marsh 23 FEB 1966
APPROVED
APPROVED Eldon C. Hall 4 Mar 66
APPROVED MIT A. C. METZGER 15 Mar 66
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, PAN HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006393
SCALE NONE
SHEET 1 OF 1

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— 1006393

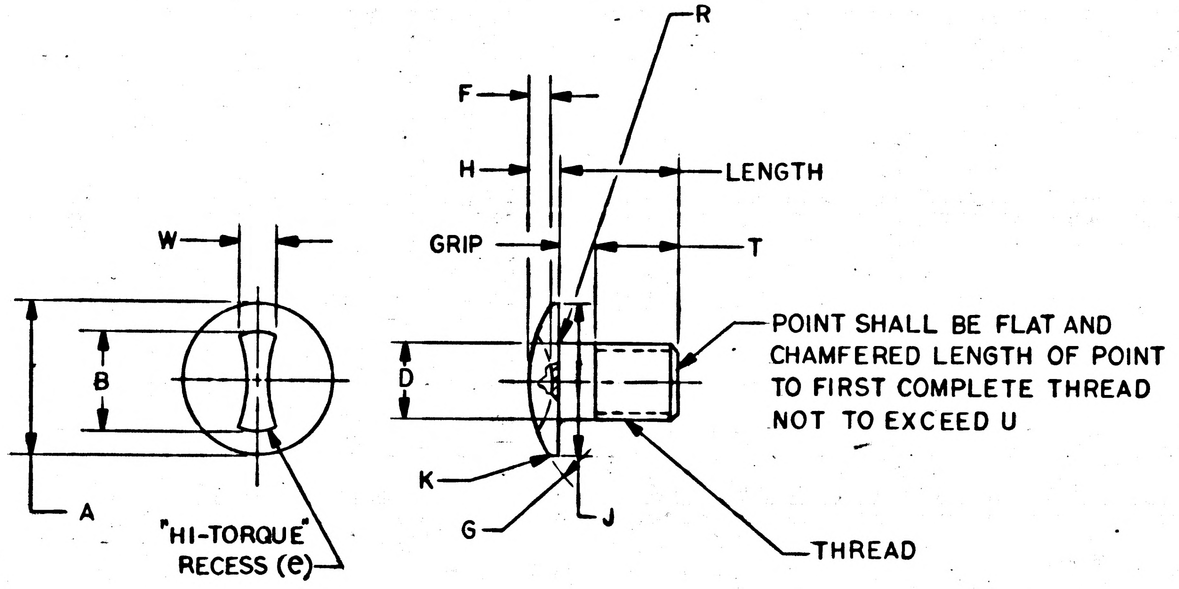
REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE PER TDRR 27098			3-15-66	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. MARKING: AS SPECIFIED IN NOTE 1.C. ABOVE.
   - B. DIMENSIONS AND TOLERANCES: AS SPECIFIED.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:
   - A. MATERIAL AND FINISH: CORROSION AND HEAT RESISTANT STEEL PER AMS 5735 ALLOY A-286, PASSIVATED PER MIL-S-5002.



POINT SHALL BE FLAT AND CHAMFERED LENGTH OF POINT TO FIRST COMPLETE THREAD NOT TO EXCEED U

DASH NUMBER	THREAD	A DIA	B REF	D DIA	F	G RAD REF	H	J DIA MIN	R RAD	T (REF)	U	W REF	K	GRIP	LENGTH	MS33750 RECESS NUMBER (e)
-001	4-40 UNC-3A	.219 .205	.208	.1115 .1095	.047 .043	.300	.063 .059	.195	.010 .005	.175	.050	.084	.028 .020	.075±.020	.250±.031	#1

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	Kel Simpson	22 FEB 1966
CHECKED	Bob Marsh	23 FEB 1966
APPROVED		
APPROVED	Elden C Hall	4 Mar 66
APPROVED MIT	A. C. METZGER	KHaff
APPROVED MSC		

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, PAN HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006393

SCALE NONE SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006394

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 26825	EJM		1-2-66	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, DIFFUSION SUB-LOT CODE, KEYING STRIPE COLOR BLUE AND THE NUMBER 394. THE BACK OF THE PACKAGE MAY BE UTILIZED FOR THE DIFFUSION SUB-LOT NUMBER.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

F. THE SHIPMENT LOTS, MADE UP OF UNITS AS SPECIFIED BY THIS DRAWING, MUST MEET THE REQUIREMENTS OF ND 1002248, WHEN PROCESSED AS SPECIFIED IN ND 1002248, PERFORMED AT THE BUYERS PLANT. LOTS OR SUBLOTS REJECTED BY THE CRITERIA OF PARA.4.3 OF ND 1002248 SHALL BE RETURNED TO THE VENDOR

2. ACCEPTANCE AND INSPECTION: QUALITY DEMONSTRATION PER TABLES I AND II

A. DEFINITIONS:

(1) A SHIPMENT LOT IS DEFINED AS A GROUP OF PARTS ASSEMBLED FROM DIFFUSION SUB-LOTS AND DATE CODES WHICH HAVE BEEN FABRICATED IN A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A CONTROLLED PROCESS. NO PROCESS CHANGES DEFINED AS CRITICAL BY ND 1015404 NEGOTIATION MAY BE CHANGED DURING THE FABRICATION OF A SHIPMENT LOT. MAXIMUM NUMBER OF UNITS SHIPPED IN A LOT SHALL BE 5,000. A MAXIMUM OF 100 DIFFUSION SUB-LOTS MAY BE USED TO ASSEMBLE ONE SHIPMENT LOT. A SHIPMENT LOT MAY INCLUDE MORE THAN ONE DATE CODE LOT.

(2) A DIFFUSION SUB-LOT IS DEFINED AS A GROUP OF PARTS FABRICATED FROM MATERIALS WHICH WERE PROCESSED THROUGH DIFFUSION MASKING, ETCHING AND METALLIZATION AT ONE TIME (A SINGLE BATCH). THIS SUB-LOT IDENTIFICATION MUST BE MAINTAINED THROUGH SUBSEQUENT STAGES OF ASSEMBLY AND TEST. A DIFFUSION SUB-LOT SHALL BE SEALED WITH ONLY ONE DATE CODE.

(3) DATE CODE LOT IS DEFINED AS THOSE UNITS SEALED DURING ONE WEEK.

B. TEST CONDITIONS:

(1) THE TESTS AS DEFINED IN TABLES I & II SHALL BE PERFORMED BY THE QUALITY CONTROL DEPARTMENT OF THE VENDOR.

(2) UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS MUST BE REFERENCED TO AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.

(3) THE PRE-SEAL TEST PER TABLE I SHALL BE PERFORMED AFTER THE FINAL PRODUCTION INTERNAL VISUAL INSPECTION AND PRIOR TO SEALING.

C. VENDOR SUPPLIED INFORMATION: THE FOLLOWING DATA AND INFORMATION IS TO BE SUPPLIED WITH EACH SHIPMENT. ALL INFORMATION SUPPLIED WILL REFERENCE THE UNIT PART NUMBER, APPLICABLE PURCHASE ORDER NUMBER, QUANTITY AND DATE OF SHIPMENT, AND THE APPLICABLE DATE CODES OR DIFFUSION LOT CODES.

(1) A CERTIFICATE OF COMPLIANCE COVERING LEAD MATERIAL REQUIREMENTS OF PARAGRAPH 3.C.(3).

(2) A CERTIFICATE OF COMPLIANCE COVERING THE REQUIREMENTS OF ND 1015404.

(3) THE NOMINAL LEAD DIMENSIONS AS REQUIRED BY PARAGRAPH 2.E.

(4) THE PRESEAL INSPECTION DATA REQUIRED BY PARAGRAPH 4.C.

(5) THE SUBGROUP 1 AND 3 TEST DATA REQUIRED BY TABLE II. A SUMMARY OF TEST RESULTS OF SUBGROUPS 1&3, INCLUDING THE NUMBER OF UNITS TESTED & NUMBER OF FAILURES FOUND, SHALL BE SUBMITTED WITH EACH SHIPMENT LOT.

D. SELECTION OF UNITS FOR TEST:

(1) THE SAMPLE USED FOR TABLE II SHALL BE RANDOMLY SELECTED FROM THE ENTIRE GROUP OF UNITS WHICH CONSTITUTE A SHIPMENT LOT.

(2) A SHIPMENT LOT MAY BE RESUBMITTED FOR TABLE II SUBGROUP 1&3, THE REQUIREMENT OF MIL-S-19500C GROUP 1&3 FOR LOT RESUBMITTAL SHALL APPLY WITH THE TIGHTENED INSPECTION FOR THE CHARACTERISTICS WHICH FAILED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	C. Johnson	2 Mar 66
CHECKED	A. Martz	3-2-66
APPROVED	L. D. Hanley	3-2-66
APPROVED	Eldon C. Hall	2 Mar 66
APPROVED MIT	A. G. METZGER	2 Mar 66
APPROVED MSC		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL NOR GATE EXPANDER
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006394
SCALE NONE		SHEET 1 OF 5

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 26825	EJM		3-2-66	WK

2. E. LEAD DIMENSIONS: THE PARTS SUPPLIED IN ANY SHIPMENT LOT MUST BE UNIFORM WITH RESPECT TO LEAD DIMENSIONS. THE LEAD THICKNESS SHALL BE WITHIN ± 0.0005 INCHES OF A NOMINAL VALUE TO BE SPECIFIED BY THE VENDOR. THE LEAD WIDTH SHALL BE WITHIN ± 0.001 INCHES OF A NOMINAL VALUE ALSO TO BE SUPPLIED. THE NOMINAL VALUES FOR EACH SHIPPING LOT WILL BE SUPPLIED WITH THE APPLICABLE SHIPMENT.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:

(1) PIN 10 CONNECTED TO N SUBSTRATE, BENEATH RESISTORS.

(2) VOLTAGE APPLIED TO ANY INPUT PIN PLUS OR MINUS 4 VOLTS WITH RESPECT TO PIN 5.

(3) THERMAL RESISTANCE, JUNCTION-CASE. (O_{JC}): 200°C/WATT.

(4) THERMAL RESISTANCE, JUNCTION-AMBIENT. (O_{JA}): 500°C/WATT.

B. TEMPERATURE:

(1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.

(2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C.

(3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX).

C. CONSTRUCTION:

(1) SEMICONDUCTOR: SILICON, NPN.

(2) ENCLOSURE: A HERMETICALLY SEALED PACKAGE ELECTRICALLY ISOLATED FROM POWER OR GROUND, THE DIMENSIONS OF WHICH MEET THE REQUIREMENTS OF FIGURE 1 AND PARAGRAPH 2.E.

(3) LEADS:

LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 WITH THE FOLLOWING EXCEPTIONS:

GOLD PLATE SHALL BE A MINIMUM OF 100 AND A MAXIMUM OF 200 MICRO INCHES. THE NICKEL STRIKE UNDER THE GOLD SHALL BE OPTIONAL BUT IF USED SHALL BE A MAXIMUM OF 100 MICRO INCHES, AND PARAGRAPH 3.4.2 SHALL NOT APPLY. CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

4. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

A. AVERAGE PROPAGATION DELAY (T_p): MEASUREMENTS SHALL BE PERFORMED ON EACH INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 2 MADE UP OF ACCEPTABLE UNITS WHERE $T_p = (T_1 + T_2)/2$. VOLTAGE 4V ± 10% DURING TEST ALL UNUSED BASES SHALL BE GROUNDED.

MASTER

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CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL.
SEE NOTE

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DRAWN	C. Johnson	2 Mar 66
CHECKED	A. Marts	3-2-66
APPROVED	L. W. Hanley	3-2-66
APPROVED	Eldon C Hall	2 Mar 66
APPROVED MIT	D. C. METZGER	2 Mar 66
APPROVED MSC		DATE

DUAL NOR GATE EXPANDER
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006394
SCALE NONE		SHEET 2 OF 5

1006394

SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE PER CLASS A PER TDRR 26825	[illegible]	[illegible]

B. VISUAL AND MECHANICAL EXTERNAL EXAMINATION UNDER 10X AND 80X MAGNIFICATION:
MARKINGS SHALL BE LEGIBLE. THE CASE FINISH SHALL HAVE NO FLAKING, SPATTERING, CHIPPING OR HOLES. THE GLASS OR CERAMIC SHALL HAVE NO SEAL IMPAIRING CRACKS. RE-ENTRANCE AT THE GLASS, CERAMIC OR SOLDER SEAL SHALL NOT EXTEND TO OVER 50% OF THE SEAL WIDTH. NO FOREIGN MATTER SHALL BE IN OR ON THE SEAL INTERFACE. LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL MAINTAIN A UNIFORM THICKNESS WITHIN LEAD SPECIFICATIONS. THE UNITS SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. LEAD SECTION (A) MAY BE CUT FROM THE LEAD PREFORM AND SHALL NOT BE SUBJECTED TO PHYSICAL EXAMINATION. NO BODY PAINT SHALL BE ON THE LEADS OR PACKAGE SEAL AREA.

C. PRESEAL VISUAL INSPECTION: THE PRESEAL VISUAL INSPECTION SHALL BE PERFORMED USING THE REJECTION CRITERIA OF ND 1002257. THE DIFFUSION SUBLOT SHALL BE UTILIZED FOR SAMPLING SPECIFIED IN TABLE I. DATA SHALL ACCOMPANY EACH SHIPMENT COVERING THE NUMBER OF SUB-LOTS TESTED, THE NUMBER OF UNITS THAT FAILED FROM EACH SUB-LOT, THE CAUSE OF FAILURE, AND THE NUMBER OF TIMES EACH SUB-LOT WAS RESUBMITTED TO TABLE I TEST.

① MAX BODY DIMENSIONS INCLUDE ALL GLASS CLIMB. BODY DIM. TO BE SYMMETRICAL ABOUT ℄ WITHIN .010 AND ℄ OF LEADS TO BE SYMMETRICAL WITHIN .005 OF ℄ OF PIN 1. ℄ OF LEADS TO BE MEASURED WITHIN .030 OF PACKAGE BODY.

② SEE PARAGRAPH 2.E.

TABLE I

PRE SEAL VISUAL INSPECTION		
TEST	TEST CONDITIONS	DIFFUSION SUB-LOT
VISUAL INTERNAL INSPECTION	SEE NOTE 2.C.(4) AND 4.C.	LTPD* = 7 MAX ACC NO. = 1

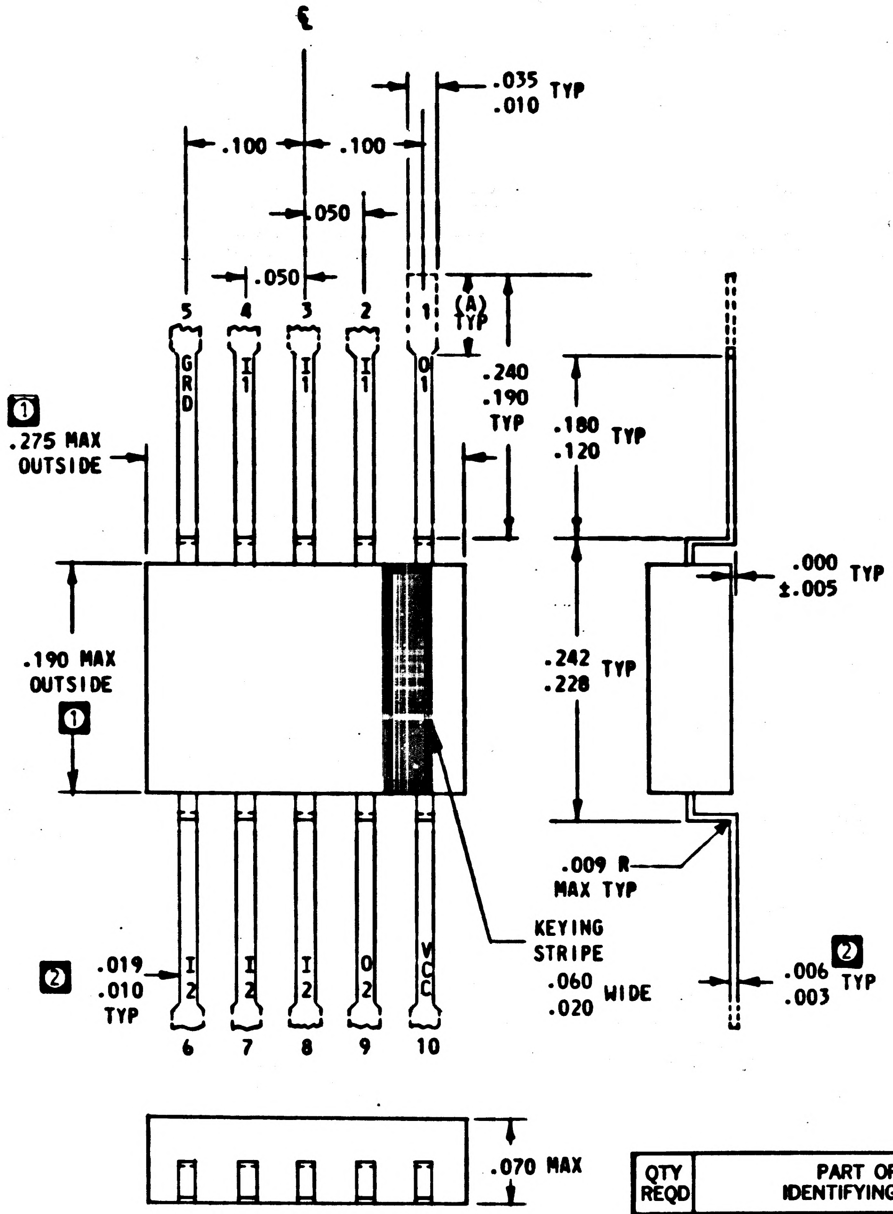

FIGURE 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT
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CAMBRIDGE, MASS
DWG NO CONTRACT

DRAWN C. Johnson DATE 2 MAR 66
CHECKED A. Martz 3-2-66
APPROVAL L D Hanley 3-2-66
APPROVAL Eldon C Hall 2 March 66
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL W Kupfer 2 Mar 66

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DUAL NOR GATE EXPANDER
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006394
SCALE NONE	WT	SHEET 3 OF 5

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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TABLE II

ACCEPTANCE INSPECTION **

TEST ***	SYMBOL	TEST CONDITIONS *****						LIMITS		UNITS	LOT
								MIN	MAX		
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE PARAGRAPH (4.B)						-	-		*LTPD = 10 MAX. ACC. NO. = 3
SUBGROUP 2		PIN 2.6	PIN 3.7	PIN 5	PIN 4.8	PIN 1.9	PIN 10				↑ 100% TESTING REQUIRED ↓
BASE CURRENT (2.7K)	I_{B1}	+870±2mV	+1800±10mV	0V	+1800±10mV	†	+4±.01V		152	uA	
BASE CURRENT (2.7K)	I_{B1}	+1800±10mV	+870±2mV	0V	+1800±10mV	†	+4±.01V		152	uA	
BASE CURRENT (2.7K)	I_{B1}	+1800±10mV	+1800±10mV	0V	+870±2mV	†	+4±.01V		152	uA	
OUTPUT VOLT PIN 1.9	V_O	+770±2mV	OPEN	0V	OPEN	†	+4±.01V		400	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	+770±2mV	0V	OPEN	†	+4±.01V		400	mV	
OUTPUT VOLT PIN 1.9	V_O	OPEN	OPEN	0V	+770±2mV	†	+4±.01V		400	mV	
SAT VOLT PIN 1.9	V_S	+870±2mV	OPEN	0V	OPEN	†	+4±.01V		250	mV	
SAT VOLT PIN 1.9	V_S	OPEN	+870±2mV	0V	OPEN	†	+4±.01V		250	mV	
SAT VOLT PIN 1.9	V_S	OPEN	OPEN	0V	+870±2mV	†	+4±.01V		250	mV	
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	+500±2mV	+500±2mV	0V	+500±2mV	+1.00±.01V	+4±.01V		15	uA	
SUBGROUP 3 COLLECT CUTOFF CURRENT	I_{CEO}	OPEN	OPEN	0V	OPEN	+5±.1V	OPEN		100	uA	*LTPD = 5 (COMBINED) MAX. ACC. NO. = 3
EMITTER CUTOFF CURRENT	I_{EBO}	0V	0V	+4±.1V	0V	OPEN	OPEN		100	uA	
COLLECT CUTOFF CURRENT	I_{CBO}	0V	0V	OPEN	0V	+8±.1V	OPEN		100	uA	
BASE CURRENT (4.15K)	I_{B2}	+870±2mV	+1800±10mV	0V	+1800±10mV	††	+4±.01V		152	uA	
BASE CURRENT (4.15K)	I_{B2}	+1800±10mV	+870±2mV	0V	+1800±10mV	††	+4±.01V		152	uA	
BASE CURRENT (4.15K)	I_{B2}	+1800±10mV	+1800±10mV	0V	+870±2mV	††	+4±.01V		152	uA	
COLLECTOR EMITTER SUSTAINING VOLTAGE	$V_{CEO\,SUST}$	I_C = 5 mA (PULSED) PINS 1.9 AND 5						5		VOLTS	
AVERAGE PROPAGATION DELAY	T_p	SEE PARAGRAPH (4.A) AND FIGURE 2							24	nsec	*LTPD = 7 MAX. ACC. NO. = 1
COLLECTOR TO POWER PIN	Z_L	BETWEEN PINS 10 AND 1.9 MEASUREMENT VOLTAGE = 10V						1000		Kohms	*LTPD = 10 MAX. ACC. NO. = 3
D.C. CURRENT GAIN	h_{FE}	I_C = 1 mA, V_{CE} = 0.5V ALL TRANSISTORS						30	200		*LTPD = 7 MAX. ACC. NO. = 1

* LTPD PER MIL-S-19500C, TABLE IV

** SAMPLE SIZE USED BY THE BUYER AND VENDOR SHALL BE THE SAME AND SHALL CORRESPOND TO THE MAX ACC NUMBER SPECIFIED IN MIL-S-19500C, TABLE IV.

*** MEASUREMENTS TO BE MADE ON GATE 1 AND GATE 2.

**** TEKTRONIX SAMPLING PROBE P6032 WITH 50X ATTENUATOR.

***** TEST TO BE PERFORMED IN SEQUENCE INDICATED.

† 2.7K 1% RESISTOR FROM PIN 1.9 TO +4±.01V

†† 4.15K 1% RESISTOR FROM PIN 1.9 TO +4±.01V

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN C Johnson 2 Mar 66
CHECKED G. Marts 3-2-66
APPROVED L D Hanley 3-2-66
APPROVED Eldon C Hall 2 Mar 66
APPROVED MIT W Kupfer 2 Mar 66
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

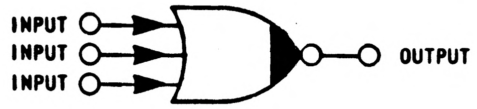
DUAL NOR GATE EXPANDER
(FLAT PACK)
SPECIFICATION CONTROL DRAWING

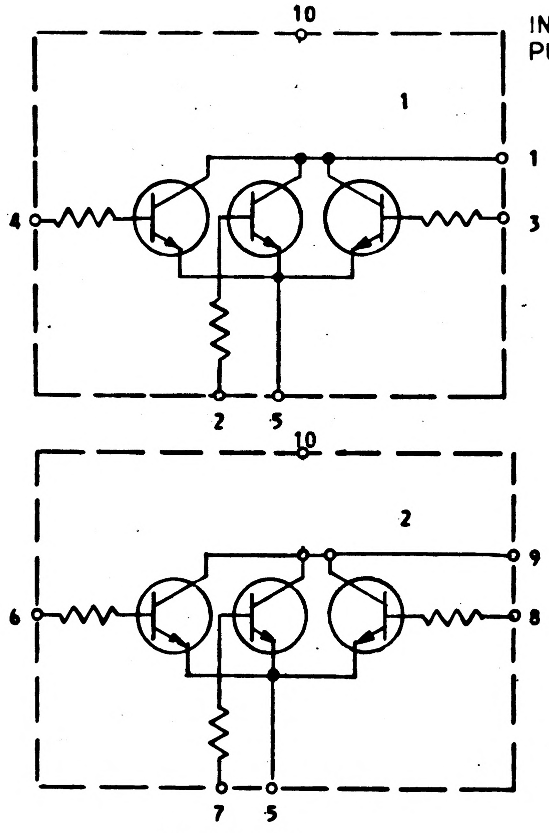
CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006394
SCALE NONE
SHEET 4 OF 5

1006394

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	INITIAL RELEASE CLASS A PER TDRR 26825	3-2-66	WK

LOGIC SYMBOL


INPUT
INPUT
INPUT
OUTPUT


10
1
1
4
3
2
5
10
2
9
6
8
7
5

SCHEMATIC

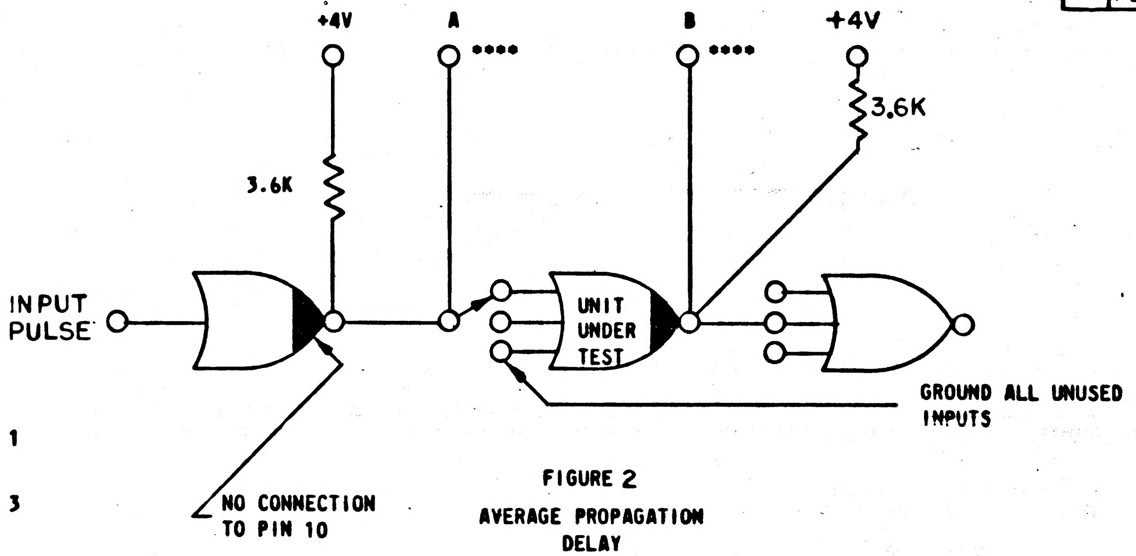
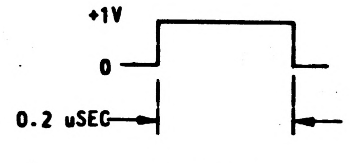
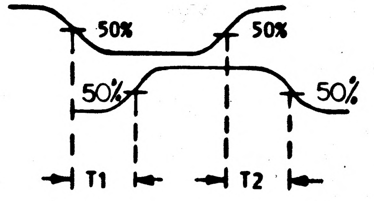

+4V
A ****
B ****
+4V
3.6K
3,6K
INPUT PULSE
UNIT UNDER TEST
GROUND ALL UNUSED INPUTS
NO CONNECTION TO PIN 10

FIGURE 2
AVERAGE PROPAGATION DELAY



INPUT PULSE


50%
50%
50%
50%
T1
T2

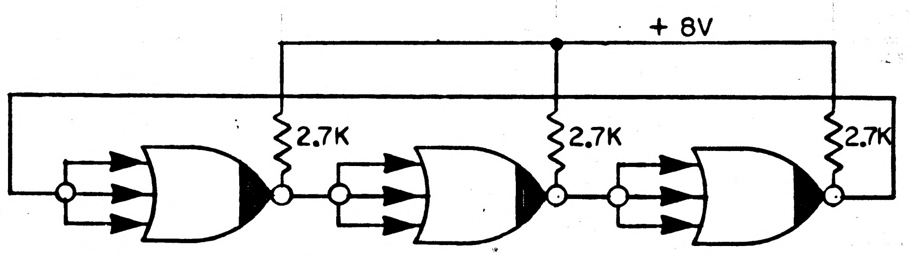

+ 8V
2,7K
2,7K
2,7K

FIGURE 3
TEST CIRCUIT - POWER BURN IN

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DWG NO CONTRACT

DRAWN C Johnson DATE 2 Mar 66
CHECKED A. Marth 3-2-66
APPROVAL L D Hanley 3-2-66
APPROVAL Eldon C Hall 2 Mar 66
APPROVAL
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006394

SCALE NONE WT SHEET 5 OF 5

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 27092			3-15-66	

REQUIREMENTS

1. GENERAL

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 1.

C. PART MARKING: CIRCUIT BOARDS, MULTILAYER, SHALL BE MARKED AND SERIALIZED PER ND 1002019 AND ND 1002023 ON THE SURFACE (S) INDICATED, WITH THE MANUFACTURER'S SYMBOL, LOT CODE NUMBER AND PART NUMBER (1006395 AND DASH NUMBER).

D. SERIALIZATION: EACH BOARD AND COUPON SHALL BE MARKED WITH THE SAME SERIAL NUMBER AND DASH NUMBER BEFORE DETACHMENT. COUPON MARKING NEED NOT CONFORM TO EITHER ND 1002019 OR ND 1002023.

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS II. BOARDS AND CORRESPONDING COUPONS SHALL BE SHIPPED CONCURRENTLY.

F. 1006395 CARD DECK: THE 1006395 CARD DECK CONSISTS OF 41 INDIVIDUAL SECTIONS. EACH CORRESPONDING TO A CIRCUIT BOARD DASH NUMBER AS LISTED IN TABLE 1, SHEET 2. THE DEFINITION OF THE FORMAT FOR THE CARD DECK IS GIVEN ON SHEET 4. CARDS AND/OR LISTINGS AVAILABLE UPON REQUEST FROM MIT/IL.

2. INSPECTION AND ACCEPTANCE:

A. ELECTRICAL REQUIREMENTS: 100% INSPECTION

1. TABS TO BE INTERCONNECTED PER 1006395 DATA CARDS.

2. INSULATION RESISTANCE: 30 MEGOHM MINIMUM. CIRCUITS SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202 METHOD 302, AT 100 VOLTS DC.

3. CONDUCTOR RESISTANCE: THE DC RESISTANCE OF ANY CONDUCTOR SHALL BE LESS THAN 0.3 OHMS WHEN TESTED IN ACCORDANCE WITH MIL-STD-202 METHOD 303.

4. A CERTIFICATE OF COMPLIANCE FOR ELECTRICAL REQUIREMENTS SHALL BE INCLUDED FOR EACH UNIT.

B. MECHANICAL REQUIREMENTS:

1. DIMENSION: AS SHOWN

3. DESIGN REQUIREMENTS

A. CIRCUIT BOARDS, MULTILAYER SHALL CONFORM TO ALL REQUIREMENTS OF ND 1002271

B. THE COUPON AND BOARDS SHALL BE SIMULTANEOUSLY SUBJECTED TO ALL PROCESSES AND SHALL REFLECT THE SAME STANDARD OF QUALITY.

C. THE 1006395 CARD DECK SHALL BE THE GOVERNING SOURCE DOCUMENTING THE CIRCUIT BOARD INTERCONNECTIONS. THE REFERENCE LOGIC FLOW DIAGRAMS SHOWN IN TABLE 1, DESIGNATE THE LOGIC FUNCTIONS BY MODULE NUMBER AND BOARD DASH NUMBER.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN A. Addario Jr. 11 March
CHECKED A. Marto 3-14-66
APPROVED L. D. Hanley 3-14-66
APPROVED Eldon C. Hall 3-15-66
APPROVED MIT 15 Mar 66
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

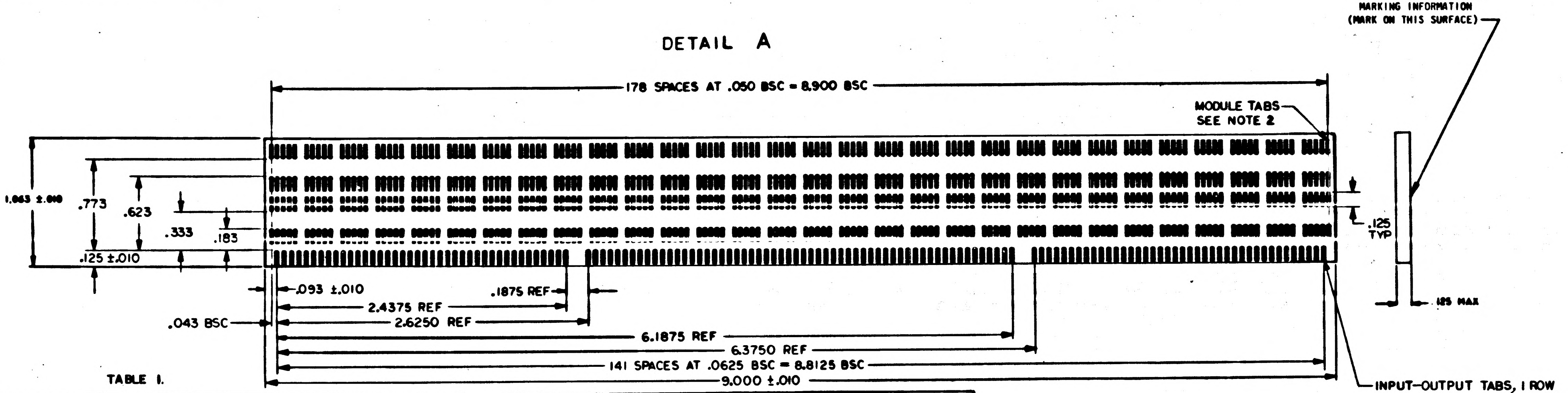
CIRCUIT BOARD MULTILAYER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1006395 —
SCALE —
SHEET 1 OF 5

NOTICE: WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 27092			3-15-66	

DETAIL A



SEE NOTE 1C AND 1D FOR MARKING INFORMATION (MARK ON THIS SURFACE)
178 SPACES AT .050 BSC = 8.900 BSC
MODULE TABS SEE NOTE 2
1.063 ±.010
.773
.623
.333
.183
.125 ±.010
.125 TYP
.125 MAX
.093 ±.010
.1875 REF
2.4375 REF
2.6250 REF
.043 BSC
6.1875 REF
6.3750 REF
141 SPACES AT .0625 BSC = 8.8125 BSC
9.000 ±.010
INPUT-OUTPUT TABS, 1 ROW SEE NOTE 2

TABLE I.

CIRCUIT BOARD DASH NO. 1006395	MOD NO.	REF. LOGIC FLOW DIAGRAM NO.	LOGIC FLOW REVISION	TAB CODING INFORMATION SEE SHEET 3	
-001	A1	2005259 SHT 1	-	FIGURES	1
-002	A1	2005259 SHT 2	-		2
-003	A2	2005260 SHT 1,2	-		1
-004	A2	2005260 SHT 3	-		2
-005	A3	2005251 SHT 1	-		1
-006	A3	2005251 SHT 2	-		2
-007	A4	2005262 SHT 1	-		1
-008	A4	2005262 SHT 2	-		2
-009	A5	2005261 SHT 1	-		1
-010	A5	2005261 SHT 2	-		2
-011	A6	2005263 SHT 1	-		1
-012	A6	2005263 SHT 2	-		2
-013	A7	2005252 SHT 1	-		1
-014	A7	2005252 SHT 2	-		2
-015	A8	2005255 SHT 1	-		1
-016	A8	2005255 SHT 2	-		2
-015	A9	2005256 SHT 1	-		1
-016	A9	2005256 SHT 2	-		2
-015	A10	2005257 SHT 1	-		1
-016	A10	2005257 SHT 2	-		2
-015	A11	2005258 SHT 1	-		1
-016	A11	2005258 SHT 2	-		2
-017	A12	2005253 SHT 1	-		1
-018	A12	2005253 SHT 2	-		2
-019	A13	2005269 SHT 1	-		1
	A13				
-020	A14	2005264 SHT 1	-		1
-021	A14	2005264 SHT 2	-		2
-022	A15	2005265 SHT 1	-		1
-023	A15	2005265 SHT 2	-		2
-024	A16	2005266 SHT 1	-		1
-025	A16	2005266 SHT 2	-		2
-026	A17	2005267 SHT 1	-		1
-027	A17	2005267 SHT 2	-		2
-028	A18	2005268 SHT 1	-		1
-029	A18	2005268 SHT 2	-		2
-030	A19	2005270 SHT 1	-		1
-031	A19	2005270 SHT 2	-		2
-032	A20	2005254 SHT 1	-		1
-033	A20	2005254 SHT 2	-		2
-034	A21	2005250 SHT 1,2	-		1
-035	A21	2005250 SHT 3	-		2
-036	A22	2005271 SHT 1	-		1
-037	A22	2005271 SHT 2	-		2
-038	A23	2005272 SHT 1	-		1
-039	A23	2005272 SHT 2	-		2
-040	A24	2005273 SHT 1	-		1
-041	A24	2005273 SHT 2	-	FIGURES	2

CIRCUIT BOARD DASH NO. 1006395	MOD. NO.	REF. LOGIC FLOW DIAGRAM NO.	LOGIC FLOW REVISION	TAB CODING INFORMATION SEE SHEET 3

NOTES:

1. ALL BASIC DIMENSIONS SHALL BE WITHIN .008 ◆
2. FOR DETAILED INFORMATION ON TABS SEE ND1002271

MASTER
(3)

QTY REQD	PART OR IDENTIFYING NO	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN a. albani 3-14-66
CHECKED a. Imarts 3-14-66
APPROVED 3-15-66
APPROVED Ellen Cahill 3-15-66
APPROVED MIT 3/16/66
A. C. Metzger
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CIRCUIT BOARD, MULTILAYER
SPECIFICATION CONTROL DRAWING

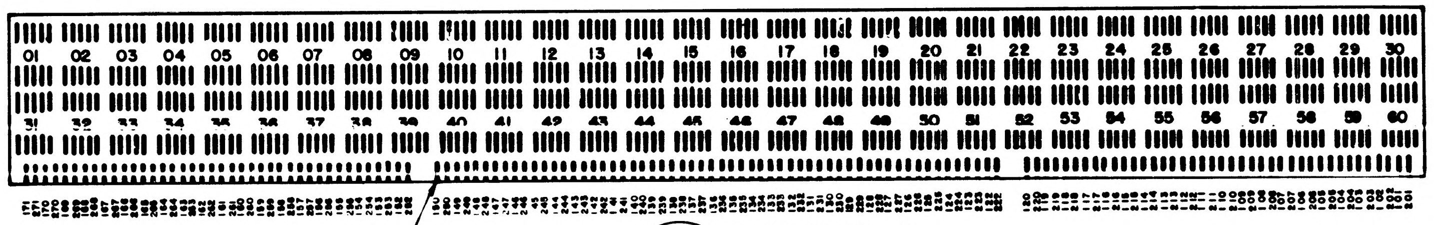
CODE IDENT NO 80230
SIZE D
DRAWING NO 1006395
SCALE 2/1
SHEET 2 OF 5

1006395

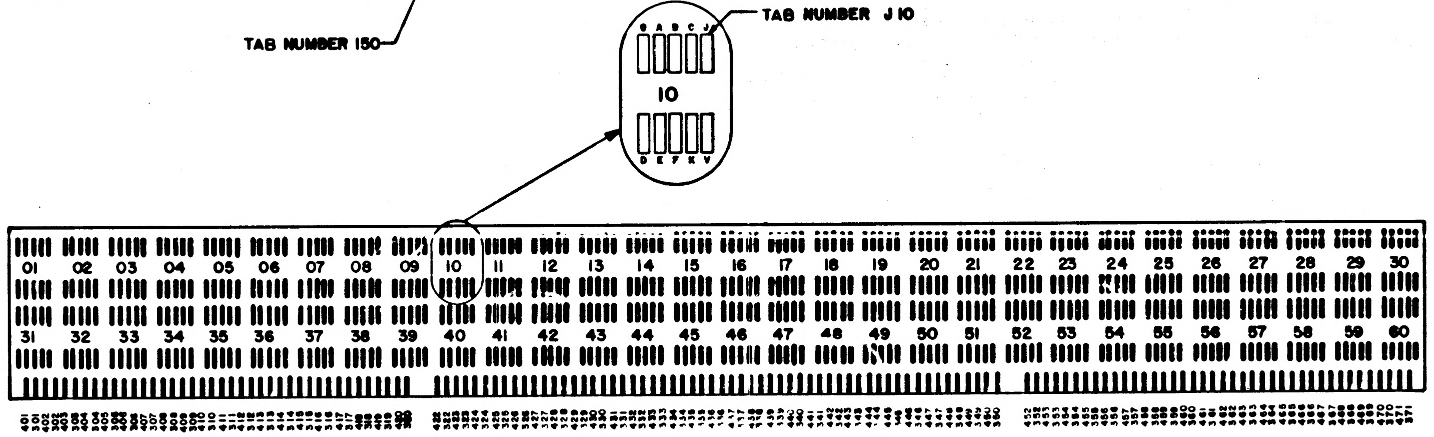
NOTICE: WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 27092			3-16-66	

TAB CODING LAYOUT
FIGURE 1


01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

TAB CODING LAYOUT
FIGURE 2


TAB NUMBER 150
TAB NUMBER J10
B A B C J
10
D E F K V
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

NOTES:
1. FIGURES 1 AND 2 – CODING NUMBERS FOR REFERENCE PURPOSES ONLY.

MASTER

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LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±—
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN A. Addonizio — 4 Mar 66
CHECKED — 3-14-66
APPROVED — 3-14-66
APPROVED — 3-15-66
APPROVED MIT —
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

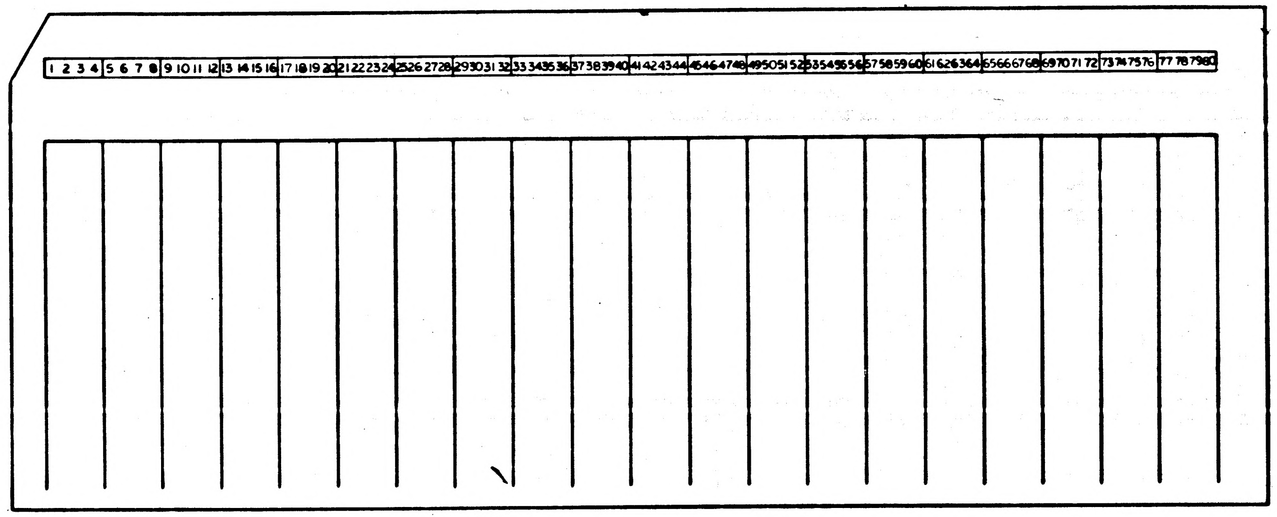
CIRCUIT BOARD, MULTILAYER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	D	1006395
SCALE NONE		SHEET 3 OF 5

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 27092			3-15-66	



DEFINITION OF DATA CARD FORMAT

CARD COLUMNS		DEFINITION
9-11	TAB NUMBER	THIS NUMBER DEFINES THE LOCATION OF A SPECIFIC WELD TAB ON A BOARD. SEE SHEET 3 FOR THE DEFINITION OF THE NUMBERING SYSTEM. LEADING ZEROS MUST BE PUNCHED.
13-15	CIRCUIT NUMBER	THIS NUMBER IS ARBITRARILY ASSIGNED TO EACH DISCRETE CIRCUIT (CONDUCTOR PATH) CONNECTING TWO OR MORE TABS ON A BOARD. LEADING ZEROS MUST BE PUNCHED. UNUSED TABS WILL BE ASSIGNED THE CIRCUIT NUMBER "999". THIS WILL REFERENCE THE FACT THAT THESE TABS ARE NOT INTERCONNECTED.
17-21	GATE NUMBER	THIS GATE NUMBER IS ENTERED ONLY ON THE "J" AND "K" TABS (SEE SHEET 3) AND LOCATES THE PARTICULAR GATE BY ITS OUTPUT TAB. IN THE SPECIAL CASE OF MODULES A08 THROUGH A11 CORRESPONDING GATES SHALL BE ENTERED ON THE SAME CARD IN THE FOLLOWING COLUMNS:
17-21		A08
22-26		A09
27-31		A10
32-36		A11
65-67	MODULE NUMBER	THIS IS THE NUMBER OF THE MODULE ASSOCIATED WITH A PARTICULAR BOARD. THE WHOLE FIELD MUST BE USED, i.e., MODULE A1 SHOULD BE ENTERED "A01".
65-69		IN THE SPECIAL CASE OF A08 THROUGH A11 THE FOLLOWING DIGITS SHALL BE USED: A0811
70-80	PART NUMBER	THIS IS THE SPECIFICATION CONTROL DRAWING AND DASH NUMBER OF A PARTICULAR BOARD. i.e., "1006395-003"

MASTER

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LIST OF MATERIALS

NEXT ASSY	USED ON
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DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 17 Mar 66
CHECKED 3-14-66
APPROVED 3-15-66
APPROVED 3-15-66
APPROVED MIT 15 Mar 66
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

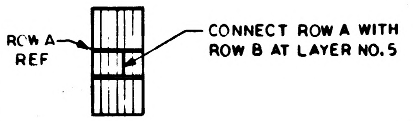
CIRCUIT BOARD, MULTILAYER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO 80230
SIZE D
DRAWING NO. 1006395
SCALE —
SHEET 4 OF 5

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 27092			3-15-66	


ROW A REF
CONNECT ROW A WITH ROW B AT LAYER NO. 5

SECTION B-B

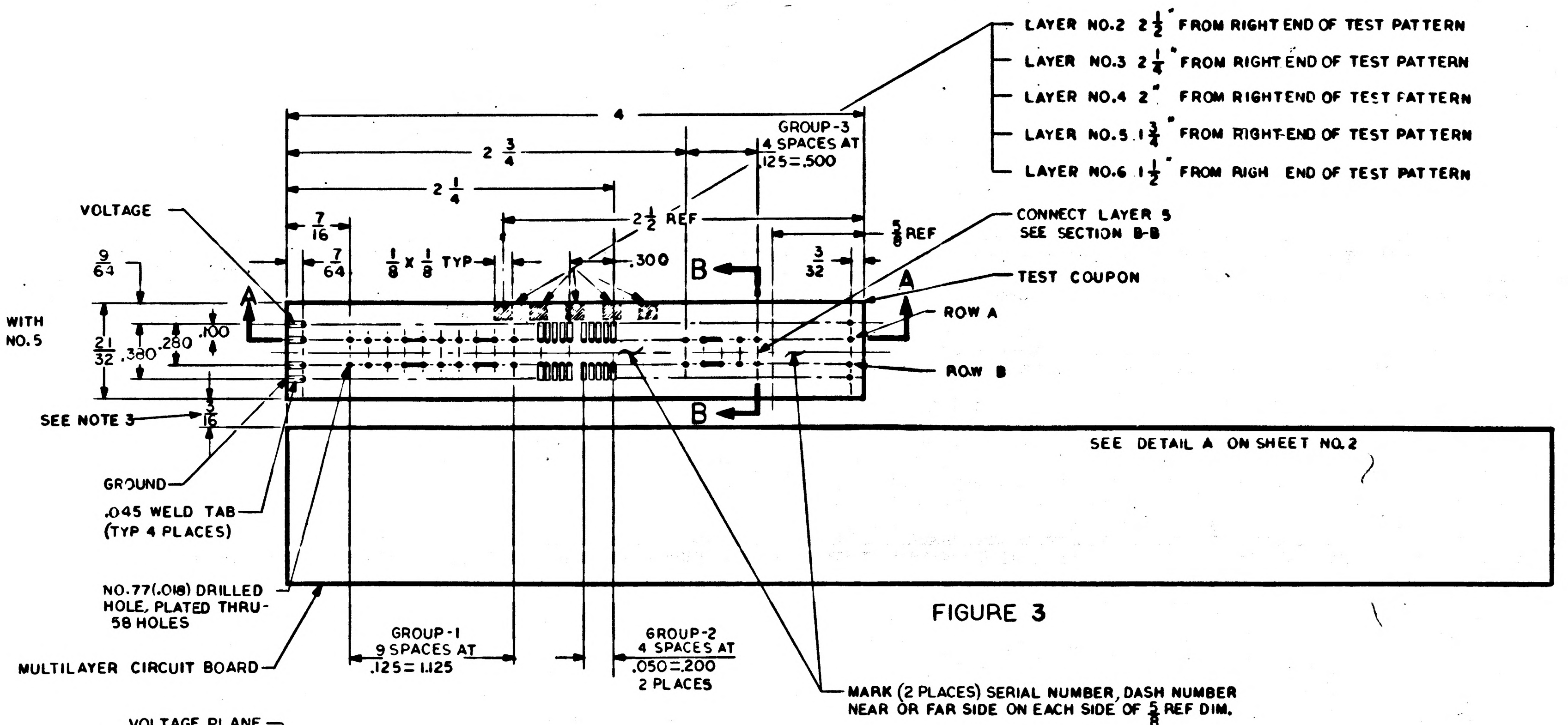
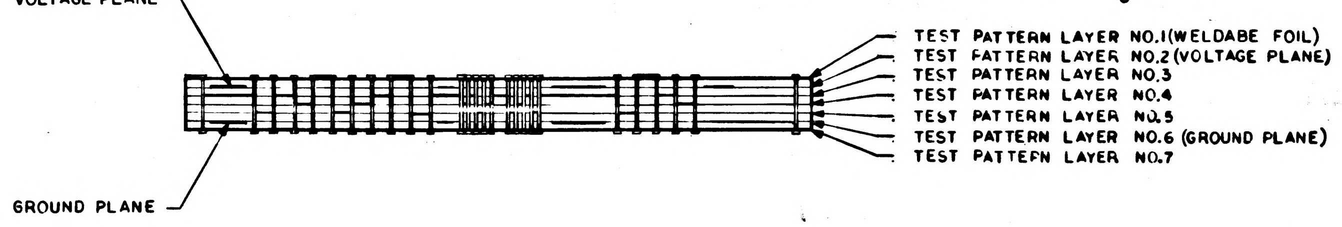

LAYER NO. 2 $2\frac{1}{2}$" FROM RIGHT END OF TEST PATTERN
LAYER NO. 3 $2\frac{1}{4}$" FROM RIGHT END OF TEST PATTERN
LAYER NO. 4 2" FROM RIGHT END OF TEST PATTERN
LAYER NO. 5 $1\frac{3}{4}$" FROM RIGHT END OF TEST PATTERN
LAYER NO. 6 $1\frac{1}{2}$" FROM RIGH END OF TEST PATTERN
4
$2\frac{3}{4}$
$2\frac{1}{4}$
GROUP-3
4 SPACES AT
.125=.500
$2\frac{1}{2}$ REF
$\frac{5}{8}$ REF
CONNECT LAYER 5
SEE SECTION B-B
TEST COUPON
VOLTAGE
$\frac{7}{16}$
$\frac{7}{64}$
$\frac{1}{8}$ X $\frac{1}{8}$ TYP
.300
$\frac{3}{32}$
$\frac{9}{64}$
$\frac{21}{32}$
.380
.280
.100
A
B
ROW A
ROW B
SEE NOTE 3
$\frac{3}{16}$
SEE DETAIL A ON SHEET NO. 2
GROUND
.045 WELD TAB
(TYP 4 PLACES)
NO. 77 (.018) DRILLED HOLE, PLATED THRU-58 HOLES
MULTILAYER CIRCUIT BOARD
GROUP-1
9 SPACES AT
.125=1.125
GROUP-2
4 SPACES AT
.050=.200
2 PLACES
MARK (2 PLACES) SERIAL NUMBER, DASH NUMBER NEAR OR FAR SIDE ON EACH SIDE OF $\frac{5}{8}$ REF DIM.

FIGURE 3


VOLTAGE PLANE
GROUND PLANE
TEST PATTERN LAYER NO. 1 (WELDABE FOIL)
TEST PATTERN LAYER NO. 2 (VOLTAGE PLANE)
TEST PATTERN LAYER NO. 3
TEST PATTERN LAYER NO. 4
TEST PATTERN LAYER NO. 5
TEST PATTERN LAYER NO. 6 (GROUND PLANE)
TEST PATTERN LAYER NO. 7

SECTION A-A

NOTES:

1. CONNECTIONS FOR ROW B SAME AS ROW A
2. ADDITIONAL BOARD LAYERS ARE TO BE ADDED BETWEEN TEST PATTERN LAYERS NO. 2 AND NO. 3 WITHOUT COPPER FOIL IN THE TEST PATTERN AREA
3. THE RELATIVE POSITION OF THE COUPON AND CIRCUIT BOARD, MULTILAYER SHOWN IN FIGURE 3 SHALL BE MAINTAINED DURING THE MANUFACTURING PROCESS PRIOR TO DETACHMENT.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN A. Addams Jr. 11 Mar 66
CHECKED A. Marts 3-14-66
APPROVED P N Hanley 3-14-66
APPROVED Eldon C Hall 3-15-66
APPROVED MIT W Kupfer 15 Mar 66
APPROVED MSC A. G. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CIRCUIT BOARD, MULTILAYER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1006395
SCALE NONE
SHEET 5 OF 5

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006396 A

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 28747			5-11-66	
	A	REVISED PER TDRR 30655	JJB	RW	21-SEP 66	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, PART NUMBER, NET CONTENTS, DATE OF MANUFACTURE, EXPIRATION DATE AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION SYMBOL.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S BEST COMMERCIAL PRACTICE.

E. CURING AGENT AND RESIN SHALL BE SHIPPED IN SCREW TOP CANS.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. THIS DRAWING IDENTIFIES A TWO COMPONENT PLASTIC FOAM MATERIAL CONSISTING OF A POLYURETHANE RESIN AND A CURING AGENT.

B. PROPERTIES (AS RECEIVED):

(1) RESIN:

(a) APPEARANCE: AMBER LIQUID

(2) CURING AGENT:

(a) APPEARANCE: YELLOW LIQUID

C. PROPERTIES (CURED): WHEN MIXED IN THE RATIO BY WEIGHT OF 10 TO 9, RESIN TO CURING AGENT, AND THE MIXTURE CURED FOR 1/2 HOUR MINIMUM AT 72°F ± 5°F A PLASTIC FOAM MATERIAL SHALL BE FORMED HAVING THE FOLLOWING PROPERTIES:

(1) DENSITY: 5 TO 6 1/2 POUNDS/CU FT PER ND1002295

(2) COMPRESSIVE STRENGTH: 130 POUNDS/SQ IN. MINIMUM PER ASTM D695-54 (AT 5% DEFLECTION).

3. DESIGN:

A. PROPERTIES (CURED): WHEN MIXED AND CURED AS SPECIFIED ABOVE MATERIAL SHALL HAVE THE FOLLOWING PROPERTIES:

(1) WATER ABSORPTION: 3.0% AFTER ONE WEEK AT 100% RELATIVE HUMIDITY.

(2) MAXIMUM SERVICE TEMPERATURE: 160°F

(3) TENSILE STRENGTH: 225 POUNDS/SQ IN. MINIMUM PER ASTM D638-58T.

B. SHELF LIFE: THE RESIN AND CURING AGENT SHALL BE CAPABLE OF BEING STORED IN TIGHTLY CLOSED CONTAINERS AT TEMPERATURES NOT TO EXCEED 100°F FOR NOT LESS THAN THREE (3) MONTHS FROM THE DATE OF SHIPMENT. Ⓦ

PRECAUTION: AFTER CONTAINERS ARE OPENED USE PROMPTLY AS PROPERTIES ARE LIMITED.

DASH NO.	MATERIAL
-001	RESIN
-002	CURING AGENT

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

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CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN K L Simpson 9 MAR 1966
CHECKED 9 MAR 1966
APPROVED
APPROVED Ellen a Hall 11 May 66
APPROVED MIT 5-11-66
A. C. METZGER
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESIN, URETHANE FOAM

SPECIFICATION CONTROL DRAWING

CODE IDENT. NO. 80230
SIZE C
DRAWING NO. 1006396
SCALE NONE
SHEET 1 OF 1

1006396 A

05/31/66

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006396 | A

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 28747			5-11-66	
	A	REVISED PER TDRR 30655	JJB	RW	21 SEP 66	
	B	REVISED PER TDRR 33643	CFB		26 APR 67	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, PART NUMBER, NET CONTENTS, DATE OF MANUFACTURE, EXPIRATION DATE AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION SYMBOL.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S BEST COMMERCIAL PRACTICE.

E. CURING AGENT AND RESIN SHALL BE SHIPPED IN SCREW TOP CANS.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. THIS DRAWING IDENTIFIES A TWO COMPONENT PLASTIC FOAM MATERIAL CONSISTING OF A POLYURETHANE RESIN AND A CURING AGENT.

B. PROPERTIES (AS RECEIVED):

(1) RESIN:

(a) APPEARANCE: AMBER LIQUID

(2) CURING AGENT:

(a) APPEARANCE: YELLOW LIQUID

C. PROPERTIES (CURED): WHEN MIXED IN THE RATIO BY WEIGHT OF 10 TO 9, RESIN TO CURING AGENT, AND THE MIXTURE CURED FOR 1/2 HOUR MINIMUM AT 81° F ± 6° F A PLASTIC FOAM MATERIAL SHALL BE FORMED HAVING THE FOLLOWING PROPERTIES:

(1) DENSITY: 5 TO 6 POUNDS/CU FT PER ND1002295, TEST METHOD B.

(2) COMPRESSIVE STRENGTH: 130 POUNDS/SQ IN. MINIMUM PER ASTM D695-54 (AT 5% DEFLECTION).

(3) RISE HEIGHT: 1.25 TO 0.80 PER ND1002295, TEST METHOD A.

3. DESIGN:

A. PROPERTIES (CURED): WHEN MIXED AND CURED AS SPECIFIED ABOVE MATERIAL SHALL HAVE THE FOLLOWING PROPERTIES:

(1) WATER ABSORPTION: 3.0% AFTER ONE WEEK AT 100% RELATIVE HUMIDITY.

(2) MAXIMUM SERVICE TEMPERATURE: 160°F

(3) TENSILE STRENGTH: 225 POUNDS/SQ IN. MINIMUM PER ASTM D638-58T.

B. SHELF LIFE: THE RESIN AND CURING AGENT SHALL BE CAPABLE OF BEING STORED IN TIGHTLY CLOSED CONTAINERS AT TEMPERATURES NOT TO EXCEED 100°F FOR NOT LESS THAN THREE (3) MONTHS FROM THE DATE OF SHIPMENT.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

PRECAUTION: AFTER CONTAINERS ARE OPENED USE PROMPTLY AS PROPERTIES ARE LIMITED.

DASH NO.	MATERIAL
-001	RESIN
-002	CURING AGENT

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN K.L. Simpson 9 MAR 1966
CHECKED 9 MAR 1966
APPROVED
APPROVED Ellen a Hall 11 May 66
APPROVED MIT A. C. METZGER 5-11-66
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESIN, URETHANE FOAM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006396
SCALE NONE
SHEET 1 OF 1

1006396 | B

05/31/00

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006396

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 28747			5-11-66	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, PART NUMBER, NET CONTENTS, DATE OF MANUFACTURE, EXPIRATION DATE AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION SYMBOL.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S BEST COMMERCIAL PRACTICE.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. THIS DRAWING IDENTIFIES A TWO COMPONENT PLASTIC FOAM MATERIAL CONSISTING OF A POLYURETHANE RESIN AND A CURING AGENT.

B. PROPERTIES (AS RECEIVED):

(1) RESIN:

(a) APPEARANCE: AMBER LIQUID

(2) CURING AGENT:

(a) APPEARANCE: YELLOW LIQUID

C. PROPERTIES (CURED): WHEN MIXED IN THE RATIO BY WEIGHT OF 10 TO 9, RESIN TO CURING AGENT, AND THE MIXTURE CURED FOR 2 HOURS MINIMUM AT 175°F ± 5°F A PLASTIC FOAM MATERIAL SHALL BE FORMED HAVING THE FOLLOWING PROPERTIES:

(1) NOMINAL DENSITY: 6 POUNDS/CU FT PER ASTM D792-50.

(2) COMPRESSIVE STRENGTH: 130 POUNDS/SQ IN. MINIMUM PER ASTM D695-54 (AT 5% DEFLECTION).

3. DESIGN:

A. PROPERTIES (CURED): WHEN MIXED AND CURED AS SPECIFIED ABOVE MATERIAL SHALL HAVE THE FOLLOWING PROPERTIES:

(1) WATER ABSORPTION: 3.0% AFTER ONE WEEK AT 100% RELATIVE HUMIDITY.

(2) MAXIMUM SERVICE TEMPERATURE: 160°F

(3) TENSILE STRENGTH: 225 POUNDS/SQ IN. MINIMUM PER ASTM D638-58T.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

B. SHELF LIFE: THE RESIN AND CURING AGENT SHALL BE CAPABLE OF BEING STORED IN TIGHTLY CLOSED CONTAINERS AT TEMPERATURES NOT TO EXCEED 100°F FOR NOT LESS THAN THREE (3) MONTHS FROM THE DATE OF SHIPMENT.

PRECAUTION: AFTER CONTAINERS ARE OPENED USE PROMPTLY AS PROPERTIES ARE LIMITED.

DASH NO.	MATERIAL
-001	RESIN
-002	CURING AGENT

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	K. L. Simpson	9 MAR 1966
CHECKED		9 MAR 1966
APPROVED		
APPROVED	Eldon C. Hall	11 May 66
APPROVED MIT	A. C. METZGER	5-11-66
APPROVED MSC		DATE

RESIN, URETHANE FOAM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006396

SCALE NONE SHEET 1 OF 1

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 28257		—	4-26-66		
A		REVISED PER TDRR 29212			6/7/66	6-7-66	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.

E. SHIPMENT LOTS MUST MEET THE ACCEPTANCE REQUIREMENTS OF ND 1002264. PROCESSING IN ACCORDANCE WITH ND 1002264 SHALL BE PERFORMED AT THE BUYERS PLANT. LOTS NOT MEETING THE ACCEPTANCE CRITERIA OF ND 1002264 SHALL BE REJECTED TO THE VENDOR.

F. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. ELECTRICAL CHARACTERISTICS: PER TABLE I.

(1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.

(2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

B. MECHANICAL PROPERTIES:

(1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

(2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK OR OTHER PROMINENT COLOR BAND DENOTING THE CATHODE END. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

(3) LEAD MATERIAL: A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT. LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY PER PS 1015401.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 350 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.

(2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 150 DEGREES CENTIGRADE. CONTACTS 3/8" FROM BODY

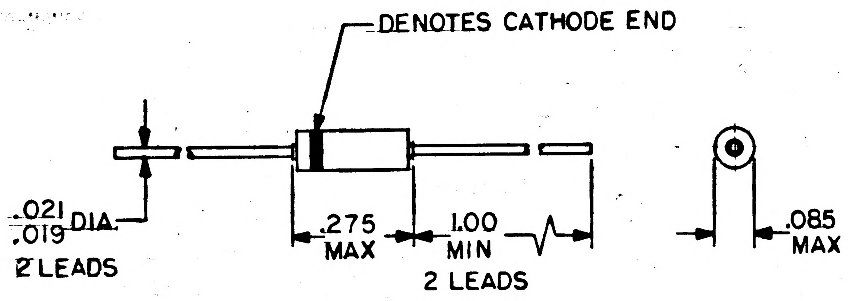
(3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(4) PEAK FORWARD SURGE CURRENT (i_f SURGE): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.

B. CONSTRUCTION: PLANAR SILICON WITH OXIDE PASSIVATION, CLEAR UNPAINTED GLASS, HERMETICALLY SEALED ENCLOSURE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER



QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN J. P. Leonard PR 13APR66
CHECKED Bob Marsh 15APR66
APPROVED P. D. Hanley 22APR 66
APPROVED Eldon C Hall 22Apr 66
APPROVED MIT A. G. METZGER
APPROVED MSC
DATE

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006399
SCALE NONE		SHEET 1 OF 2

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 28257	TB		4-26-6	
A		REVISED PER TDRR 29212	B		6/3/66	6-7-66

TABLE I

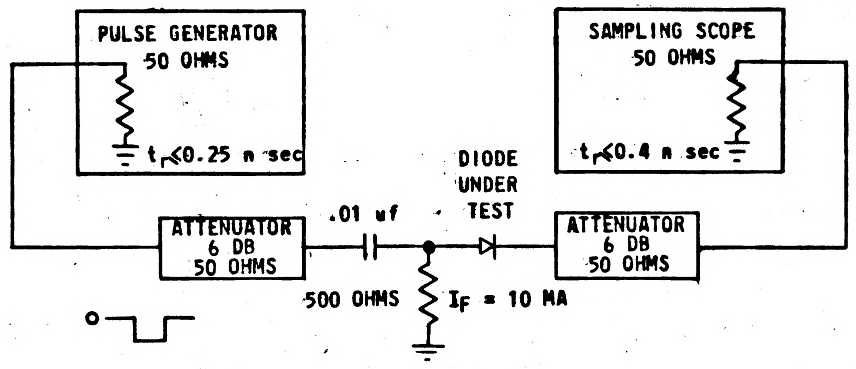
ELECTRICAL CHARACTERISTICS

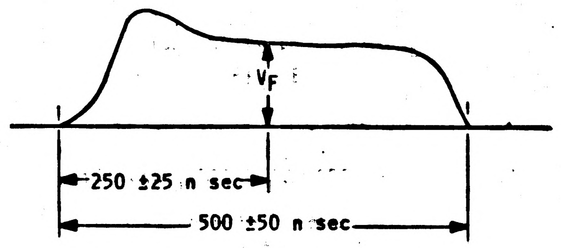
ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 60 VOLTS MIN	-	100	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	70	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA RECOVER TO 1 MA	-	10	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.730	.850	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%, SEE FIG. 2		1.35	VOLTS
6	CAPACITANCE	C	V_R = 1 VDC f = 1 MC		10	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150 C V_R = 30 VOLTS MIN		50	MICROAMPS

FIGURE 1

TEST CIRCUIT – REVERSE RECOVERY TIME





OUTPUT VOLTAGE WAVE SHAPE

FIGURE 2

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN J.P. Leonard PK 13APR66
CHECKED Bob Marsh 15APR66
APPROVED L.D. Hanley 22APR66
APPROVED Ellen O Hall 22Apr66
APPROVED MIT W Kupfer
E. C. METZGER
APPROVED MSC
DATE

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006399
SCALE NONE
SHEET 2 OF 2

MASTER

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
–		INITIAL RELEASE CLASS A PER TDRR 28257			4-26-66		
A		REVISED PER TDRR 29212			6/7/66	6-7-66	
B		REVISED PER TDRR 32569	AF	DCW	13JAN67		

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.

   E. SHIPMENT LOTS MUST MEET THE ACCEPTANCE REQUIREMENTS OF ND 1002314. PROCESSING IN ACCORDANCE WITH ND 1002314 SHALL BE PERFORMED AT THE BUYERS PLANT. LOTS NOT MEETING THE ACCEPTANCE CRITERIA OF ND 1002314 SHALL BE REJECTED TO THE VENDOR.

   F. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

   A. ELECTRICAL CHARACTERISTICS: PER TABLE I.

      (1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.

      (2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

   B. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

      (2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK OR OTHER PROMINENT COLOR BAND DENOTING THE CATHODE END. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

      (3) LEAD MATERIAL: A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT. LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY. PER 1015401.

3. DESIGN:

   A. ABSOLUTE MAXIMUM RATINGS:

      (1) POWER DISSIPATION: 350 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.

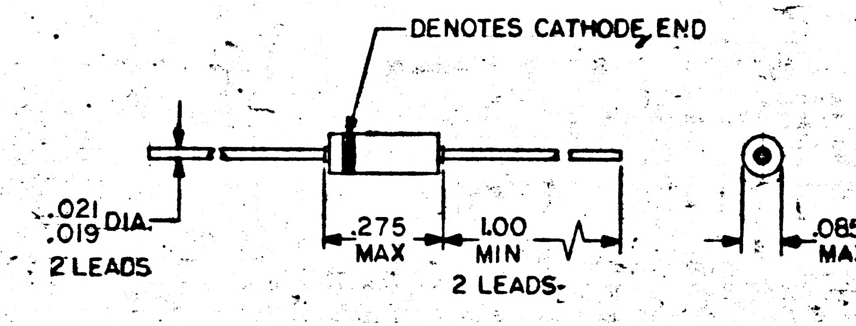
      (2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 150 DEGREES CENTIGRADE. CONTACTS 3/8" FROM BODY

      (3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

      (4) PEAK FORWARD SURGE CURRENT (i_f SURGE): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.

   B. CONSTRUCTION: PLANAR SILICON WITH OXIDE PASSIVATION, CLEAR UNPAINTED GLASS, HERMETICALLY SEALED ENCLOSURE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	J. P. Leonard	13APR66
CHECKED	Bob Marsh	15APR66
APPROVED		22APR66
APPROVED	Eldon C Hall	22Apr66
APPROVED MIT	A. G. METZGER	
APPROVED MSC		DATE

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006399

SCALE NONE
SHEET 1 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 28257	TB		4-26-66		
A		REVISED PER TDRR 29212			6/3/66	6-7-66	
B		REVISION STATUS CHANGED	AF	DW	13 JAN 67		

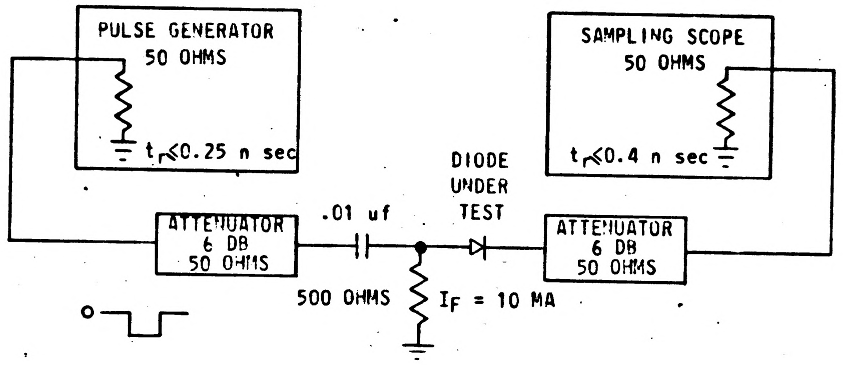
TABLE I

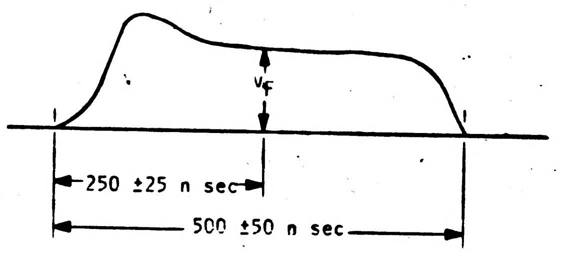
ELECTRICAL CHARACTERISTICS

ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 60 VOLTS MIN	-	100	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	70	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA RECOVER TO 1 MA	-	10	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.730	.850	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%, SEE FIG. 2		1.35	VOLTS
6	CAPACITANCE	C	V_R = 1 VDC f = 1 MC		10	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150 C V_R = 30 VOLTS MIN		50	MICROAMPS

FIGURE 1
TEST CIRCUIT – REVERSE RECOVERY TIME





OUTPUT VOLTAGE WAVE SHAPE.
FIGURE 2

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J. P. Leonard PK 13APR66
CHECKED Bob Marsh 15APR66
APPROVED E D Hanley 22APR66
APPROVED Eldon C Hall 22Apr66
APPROVED MIT W Kupfer R. C. METZGER
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006399
SCALE NONE
SHEET 2 OF 2

1006399 B

MODERN BLUE PRINT CO. D 19550

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 28257			4-26-66		
A		REVISED PER TDRR 29212			6/7/66	6-7-66	
B		REVISED PER TDRR 32569	AF	DW	13JAN67		
C		REVISED PER TDRR 32571	AF	DW	13JAN67		

REQUIREMENTS:

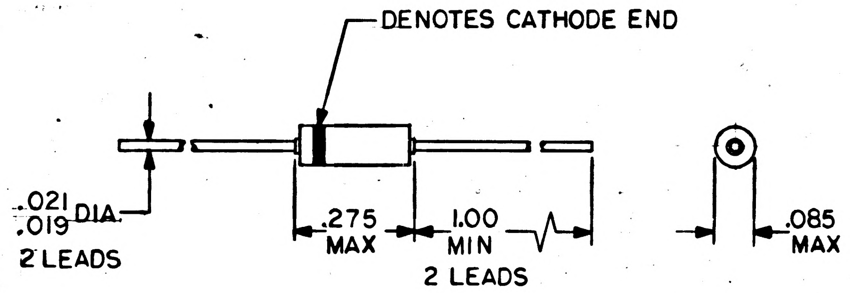
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.
   - E. SHIPMENT LOTS MUST MEET THE ACCEPTANCE REQUIREMENTS OF ND 1002314. PROCESSING IN ACCORDANCE WITH ND 1002314 SHALL BE PERFORMED AT THE BUYERS PLANT. LOTS NOT MEETING THE ACCEPTANCE CRITERIA OF ND 1002314 SHALL BE REJECTED TO THE VENDOR.
   - F. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.
2. ACCEPTANCE AND INSPECTION:
   - A. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.
     - (2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.
   - B. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.
     - (2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK OR OTHER PROMINENT COLOR BAND DENOTING THE CATHODE END. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
     - (3) LEAD MATERIAL: A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT. SEE TABLE II
3. DESIGN:
   - A. ABSOLUTE MAXIMUM RATINGS:
     - (1) POWER DISSIPATION: 350 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.
     - (2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 150 DEGREES CENTIGRADE. CONTACTS 3/8" FROM BODY
     - (3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.
     - (4) PEAK FORWARD SURGE CURRENT (i_f SURGE): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.
   - B. CONSTRUCTION: PLANAR SILICON WITH OXIDE PASSIVATION, CLEAR UNPAINTED GLASS, HERMETICALLY SEALED ENCLOSURE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE II

PART NO	LEAD MATERIAL
-000	IRON-NICKEL ALLOY PER PS 1015401
-001	IRON-NICKEL ALLOY PER PS 1015401 EXCEPT PLATING TO BE NICKEL 75 $^{+10}_{-25}$ MICRO INCHES THICKNESS

NOTE: THE ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NUMBER AND A-000 SUFFIX.



QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	J. P. Leonard	13APR66
CHECKED	Bob Marsh	15APR66
APPROVED	L D Hanley	22APR 66
APPROVED	Eldon C Hall	22Apr66
APPROVED MIT	A. G. METZGER	
APPROVED MSC		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006399
SCALE NONE		SHEET 1 OF 2

1006399 C

MODERN BLUE PRINT CO. D-19550

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
—		INITIAL RELEASE CLASS A PER TDRR 28257	JB		4-26-66		
(M) A		REVISED PER TDRR 29212	B	[illegible]	6/3/66	6-7-66	[illegible]
B		REVISION STATUS CHANGED	AF	DW	13JAN67		
C		REVISION STATUS CHANGED	AF	DW	13JAN67		

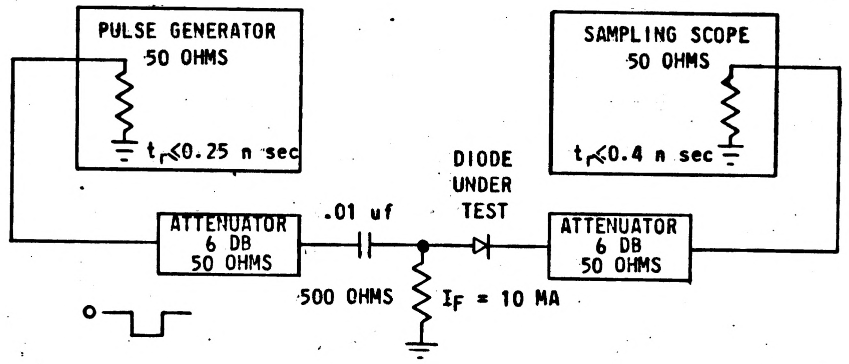
TABLE I

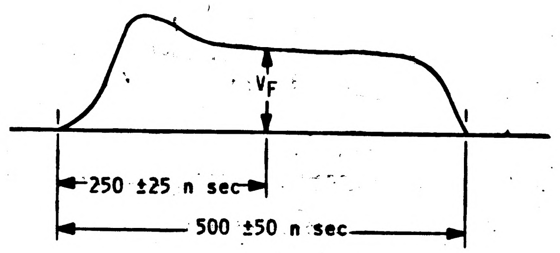
ELECTRICAL CHARACTERISTICS

ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 60 VOLTS MIN	-	100	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	70	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA RECOVER TO 1 MA	-	10	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.730	.850	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%, SEE FIG. 2		1.35	VOLTS
6	CAPACITANCE	C	V_R = 1 VDC f = 1 MC		10	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150 C V_R = 30 VOLTS MIN		50	MICROAMPS

FIGURE 1
TEST CIRCUIT - REVERSE RECOVERY TIME





OUTPUT VOLTAGE WAVE SHAPE
FIGURE 2

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	J.P. Leonard PK	13APR66
CHECKED	Bob Marsh	15APR66
APPROVED	L.D. Hanley	22APR66
APPROVED	Ellen O Hall	22Apr66
APPROVED MIT	A. C. METZGER	
APPROVED MSC		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006399

SCALE NONE SHEET 2 OF 2

1006399 C

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 28257			4-26-66	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.

E. SHIPMENT LOTS MUST MEET THE ACCEPTANCE REQUIREMENTS OF ND 1002264. PROCESSING IN ACCORDANCE WITH ND 1002264 SHALL BE PERFORMED AT THE BUYERS PLANT. LOTS NOT MEETING THE ACCEPTANCE CRITERIA OF ND 1002264 SHALL BE REJECTED TO THE VENDOR.

F. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. ELECTRICAL CHARACTERISTICS: PER TABLE I.

(1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.

(2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

B. MECHANICAL PROPERTIES:

(1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

(2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK OR OTHER PROMINENT COLOR BAND DENOTING THE CATHODE END. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

(3) LEAD MATERIAL: A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT. LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY PER PS 1015401.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 500 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.

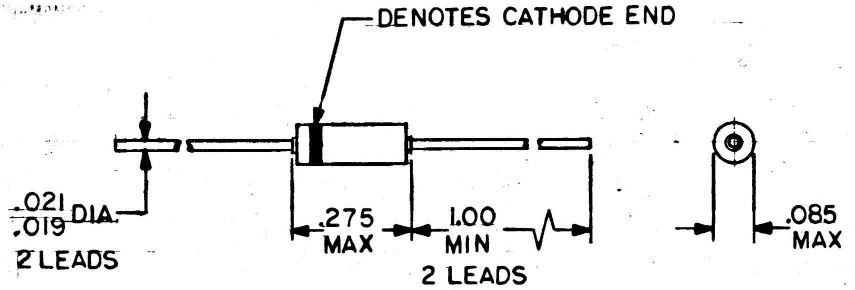
(2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 175 DEGREES CENTIGRADE.

(3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(4) PEAK FORWARD SURGE CURRENT (i_f SURGE): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.

B. CONSTRUCTION: PLANAR SILICON WITH OXIDE PASSIVATION, CLEAR UNPAINTED GLASS, HERMETICALLY SEALED ENCLOSURE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	J. P. Leonard PR	13APR66
CHECKED	Bob Marsh	15APR66
APPROVED		22APR 66
APPROVED	Eldon C Hall	22Apr66
APPROVED MIT	A. G. METZGER	
APPROVED MSC		DATE

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006399
SCALE NONE		SHEET 1 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
–		INITIAL RELEASE CLASS A PER TDRR 28257	TB		4-26-6	

TABLE I

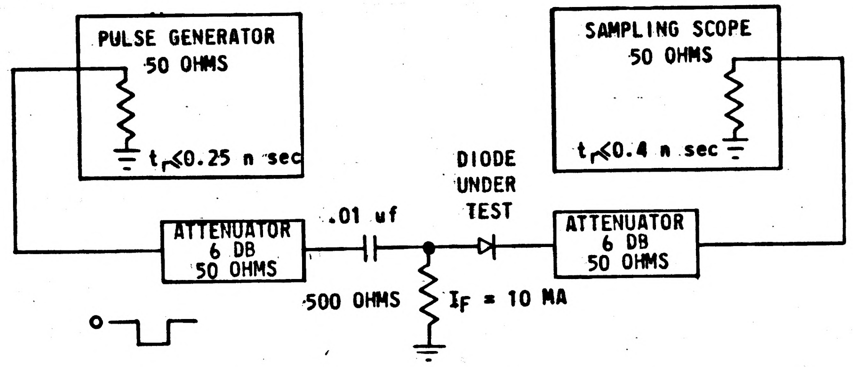
ELECTRICAL CHARACTERISTICS

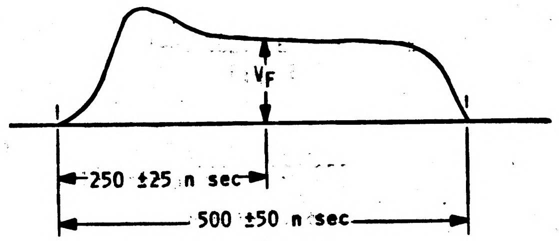
ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 70 VOLTS MIN	-	20	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	80	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA RECOVER TO 1 MA	-	10	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.730	.850	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%, SEE FIG. 2		1.35	VOLTS
6	CAPACITANCE	C	V_R = 1 VDC f = 1 MC		10	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150 C V_R = 30 VOLTS MIN		20	MICROAMPS

FIGURE 1

TEST CIRCUIT - REVERSE RECOVERY TIME





OUTPUT VOLTAGE WAVE SHAPE
FIGURE 2

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MASTER

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN J.P. Leonard PK 13APR66
CHECKED Bob Marsh 15APR66
APPROVED L.D. Hanley 22APR66
APPROVED Ellen O Hall 22Apr66
APPROVED MIT W. Kupfer 15Aug66
R. C. METZGER
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE
SILICON PLANAR, OXIDE PASSIVATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006399
SCALE NONE		SHEET 2 OF 2

–	1006402

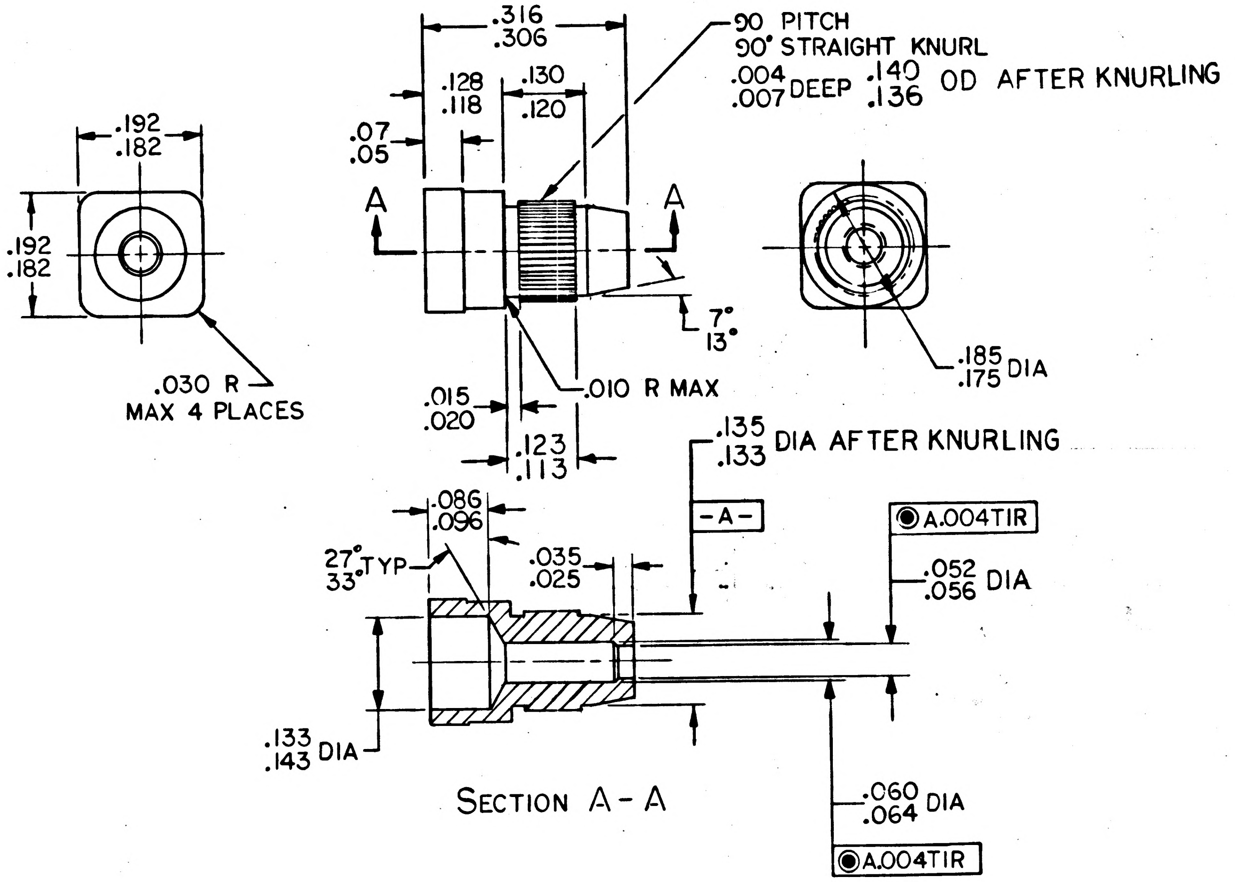
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 21571		

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION: SAMPLING
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTE 1.B.
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND FINISH REQUIREMENTS.
3. DESIGN:
   - A. MATERIAL: ALUMINUM ALLOY, 1100 - H14, IN ACCORDANCE WITH QQ-A-561.
   - B. FINISH: SEE TABLE I.

TABLE I

DASH NO.	PROTECTIVE FINISH
-001	CLEAR ANODIZE PER MIL-A-8625, TYPE II.
-002	NONE
-003	IRRIDESCENT YELLOW CHROMATE FILM PER MIL-C-5541.



.316
.306
.128
.118
.130
.120
.07
.05
90 PITCH
90° STRAIGHT KNURL
.004
.007 DEEP
.140
.136 OD AFTER KNURLING
.192
.182
.192
.182
A
A
7°
13°
.030 R
MAX 4 PLACES
.185
.175 DIA
.010 R MAX
.015
.020
.123
.113
.135
.133 DIA AFTER KNURLING
.086
.096
-A-
A.004TIR
27°
33° TYP
.035
.025
.052
.056 DIA
.133
.143 DIA
SECTION A - A
.060
.064 DIA
A.004TIR

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Wong DMS DATE 10JUNE65
CHECKED E Urban WBM 16 JUN 65
APPROVAL G. E. Parker 8/16/65 J. M. Adams 8/16/65
APPROVAL D. O'Bryant 8/16/65
APPROVAL E. G. Soave 8-16-65
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL A. Havens 8/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLEEVE, GROUNDING, MALE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006402
SCALE NONE	WT	SHEET 1 OF 1

1006402 –

1006403 | -

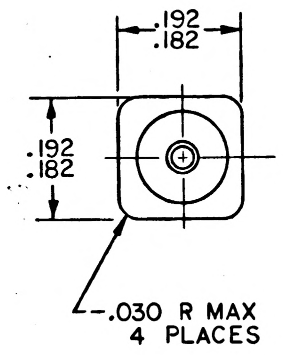
SYM	DESCRIPTION	DATE	APPROVED
REVISIONS			
-	CLASS A RELEASE PER TDRR 21571		

REQUIREMENTS:

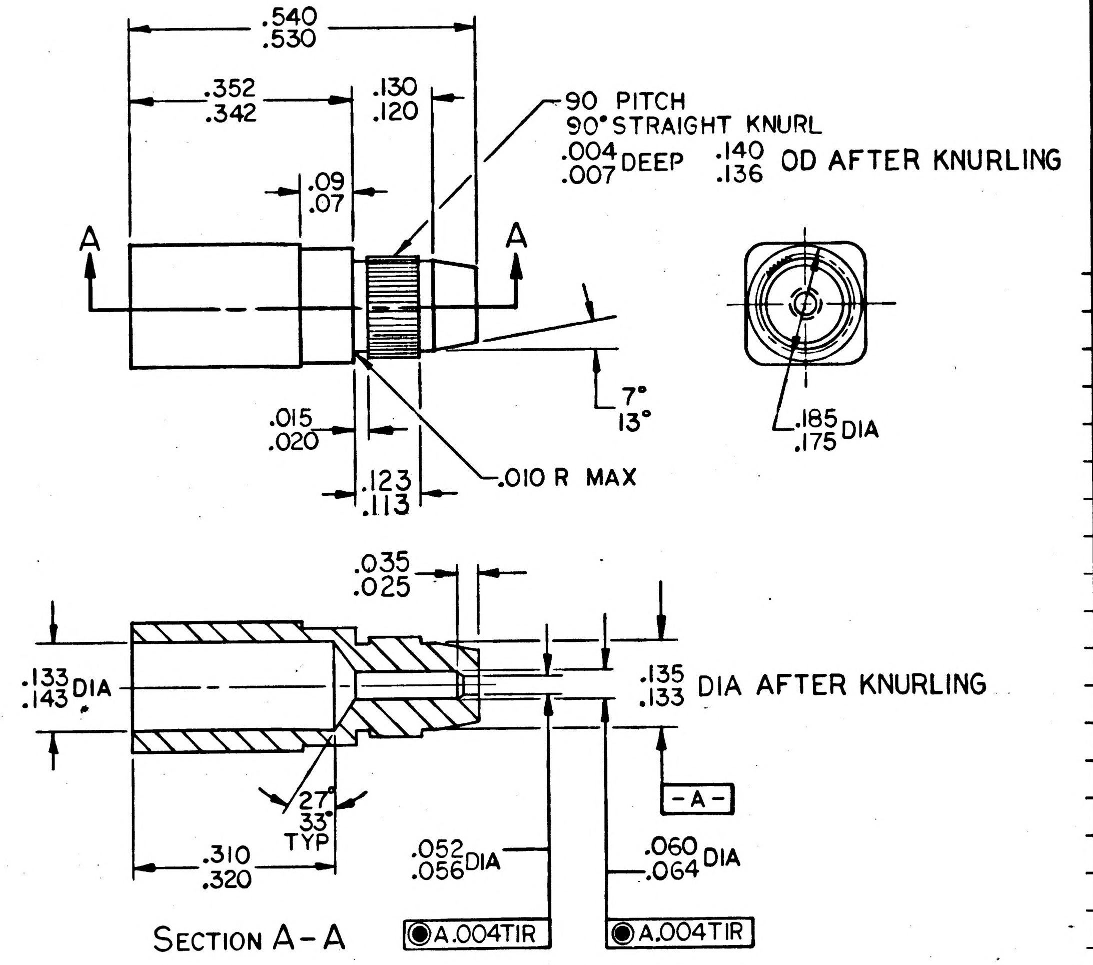
1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION; SAMPLING
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTE 1.B.
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND FINISH REQUIREMENTS.
3. DESIGN:
   - A. MATERIAL: ALUMINUM ALLOY, 1100 - H14, IN ACCORDANCE WITH QQ-A-561.
   - B. FINISH: SEE TABLE I.

TABLE I

DASH NO.	PROTECTIVE FINISH
-001	CLEAR ANODIZE PER MIL-A-8625, TYPE II.
-002	NONE
-003	IRRIDESCENT YELLOW CHROMATE FILM PER MIL-C-5541.



.192
.182
.192
.182
.030 R MAX
4 PLACES



.540
.530
.352
.342
.130
.120
90 PITCH
90° STRAIGHT KNURL
.004
.007 DEEP
.140
.136 OD AFTER KNURLING
.09
.07
A
A
7°
13°
.015
.020
.123
.113
.010 R MAX
.185
.175 DIA
.035
.025
.133
.143 DIA
.135
.133 DIA AFTER KNURLING
-A-
27°
33°
TYP
.310
.320
.052
.056 DIA
.060
.064 DIA
SECTION A-A
A.004TIR
A.004TIR

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN H. Wong DATE 11 JUN65
CHECKED J. Ho 16 JUN65
APPROVAL G.E. Dub 8/16/65 J. Mc Adams 8/16/65
APPROVAL D. O'Bryant 8/16/65
APPROVAL E.A. Soave 8-16-65
NASA APPROVAL G.G. Wh
MIT APPROVAL
MIT APPROVAL G Harano 8/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLEEVE, GROUNDING, FEMALE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006403
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006405 A

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/16/65	O. Harano
1	REVISED PER CCA R25233 DR J. Doty CHK J. Gilreath APPD J. Hardy	27 Oct 65	S.J.S.
2	REVISED PER CCA R25355 DR P. Milant CHK S. J. Kozynski APPD J. Hardy	11/11/65	S.J.S.
—	RELEASED CLASS A PER TDRR 24529		
A	REVISED PER TDRR 26235 DR W. Brown CHK APPD H. Maynard	3/21/66	

REQUIREMENTS:

1. GENERAL:

A. SWITCHES SHALL CONFORM TO THE REQUIREMENTS OF MIL-S-22885 AND THE REQUIREMENTS HEREIN.

B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

C. PART MARKING: SWITCH BODIES SHALL BE MARKED WITH THE MANUFACTURER'S NAME, PART NUMBER, NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), REVISION LETTER, TERMINAL IDENTITY, AND UNIT ORIENTATION.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLING.

A. MECHANICAL PROPERTIES:

(1) DISASSEMBLY FORCE (AXIAL PULL ON LIGHT CAPSULE): 3 POUNDS MAXIMUM.

(2) ACTUATING FORCE (AXIAL PUSH ON LIGHT CAPSULE); 1.0 - 4.0 POUNDS.

(3) ACTUATOR TRAVEL (NOMINAL): .100 PRETRAVEL, .120 TOTAL.

(4) SWITCH ACTUATION INDICATION: BOTH FEEL AND SOUND AS A DEFINITE CHARACTERISTIC.

(5) ACTUATOR STRENGTH: 25 POUNDS MINIMUM AXIAL FORCE.

(6) OPERATION: THE FOUR SWITCHES (POLES) SHALL BE ON WHEN THE FRONT LENS IS DEPRESSED AND RELEASED AFTER AN INDICATION OF BOTH FEEL AND SOUND. TO TURN SWITCH OFF, ANOTHER ACTUATION IS NECESSARY.

(7) ASSEMBLY AND DISASSEMBLY: SEE FIGURE 1. BY REMOVING THE LIGHT CAPSULE (PULL OUT) LAMPS MAY BE REPLACED. WITH THE CAPSULE DISASSEMBLED, THE BEZEL (LENS HOLDER) MAY BE LIFTED UP AND SEPARATED TO ALLOW SERVICING OF COLOR FILTER, DISPLAY SCREEN, AND FRONT LENS.

(8) MOUNTING: SWITCHES MOUNT IN A RECTANGULAR HOLE (AS DELINEATED) BY ADJUSTABLE PAWLS, ACTUATED BY SCREWS, ARRANGED SO THAT DIAGONALLY OPPOSITE CORNERS ARE USED ALLOWING CLOSE SIDE-BY-SIDE MULTIPLE MOUNTING.

(9) LEGEND: .110 (NOMINAL) HIGH CHARACTERS (.017 NOMINAL LINE WIDTH) REVERSE ENGRAVED AND FILLED BLACK ON THE REAR SURFACE OF THE CLEAR PUSH BUTTON LENS. ALL LINES OF CHARACTERS SHALL BE CENTRALLY LOCATED.

(10) TERMINAL STRENGTH: 5 POUNDS MINIMUM AXIAL LOAD APPLIED WITHOUT SHOCK.

B. ELECTRICAL CHARACTERISTICS:

(1) SWITCH CONTACT ARRANGEMENT: 4 PDT ALTERNATING ON-OFF.

(2) CONTACT RESISTANCE: 100 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES DC WHEN 2 VOLTS ARE APPLIED THRU A SUITABLE RESISTOR. THE SWITCHES MAY BE OPERATED 5 TIMES PRIOR TO MEASUREMENT.

(3) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).

(4) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 500 VDC BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

3. DESIGN:

A. OPERATING LIFE: 100,000 CYCLES MINIMUM OF MECHANICAL OPERATION (25,000 CYCLES UNDER A RESISTIVE LOAD). A CYCLE SHALL BE TWO PUSHES OF ACTUATOR i.e. THE COUNTER WOULD BE SET UP ON ONE SWITCH TERMINAL.

B. CONSTRUCTION AND MATERIAL: A BASIC UNIT HOUSING WITH SWITCHES AND A REMOVABLE LENS AND LIGHT CAPSULE ASSEMBLY (SEE FIGURE 1). THE LIGHT CAPSULE ACCOMODATES TWO T-1$\frac{3}{4}$ MIDGET FLANGED BASE LAMPS. (LAMPS NOT SUPPLIED)

(1) HOUSING: CORROSION-RESISTING STEEL

(2) LIGHT CAPSULE AND SWITCH DIELECTRIC: DIALLYL PHTHALATE

(3) BEZEL OR LENS HOLDER: NYLON (ZYTEL)

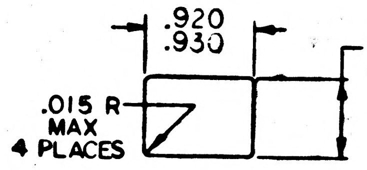
(4) FRONT LENS, DISPLAY SCREEN, AND COLOR FILTER: ACRYLIC

C. ELECTRICAL RATINGS (SWITCH CONTACTS):

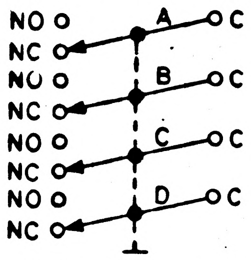
(1) 4.0 AMPERES AT 28 VDC RESISTIVE LOAD.

(2) 2.5 AMPERES AT 28 VDC INDUCTIVE LOAD.

(3) 1.0 AMPERE AT 28 VDC LAMP LOAD.

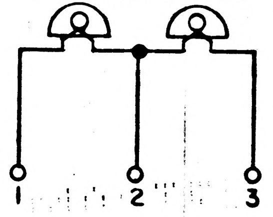


RECOMMENDED MOUNTING HOLE



SWITCH SCHEMATIC

LAMP SCHEMATIC



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S.J. Baron DATE 6 JULY 65
CHECKED A. Kuper 14 AUG 65
APPROVAL V. F. Cocuera 9-10-65
APPROVAL D. O'Bryant 9/14/65
APPROVAL M. J. Bom 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Kupfer 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006405
SCALE NONE
WT
SHEET 1 OF 4

1006405 A

DASH NO.	DESCRIPTION #
-001	BASIC UNIT - 4PDT SWITCH AND LIGHT CAPSULE
-002	COLOR FILTER - FULL WHITE
-003	DISPLAY SCREEN - FULL
-004	LENS, MARKED SCALER, FREQ, TEST
-005	INO-7, INHIBIT, UPSYNC
-006	INO-11, G/N ATT, CONT MODE
-007	INO-12, G/N ΔV, MODE
-008	INO-13, G/N ENTRY, MODE
-009	INO-15, MARK
-010	IN2-5, LIFT OFF
-011	IN2-6, GUIDANCE, RELEASE
-012	IN2-7, SATURN, ULLAGE
-013	IN2-8, S IV B, SEPARATE
-014	IN2-9, SM/CM, SEPARATE
-015	IN2-10, CDU FAIL
-016	IN2-11, PIPA FAIL
-017	IN2-12, IMU FAIL
-018	IN2-13, SCS ΔV, MODE
-019	IN2-14, G/N MON , MODE
-020	IN3-1, K1
-021	IN3-2, K2
-022	IN3-3, K3
-023	IN4-4, K4
-024	IN3-5, K12
-025	IN3-6, TRANSFER, SWITCH
-026	IN3-7, K5
-027	IN3-10, OPT MODE, SW3
-028	IN3-11, STAR PRES
-029	IN3-12, ZERO OPT
-030	IN3-13, SEXTANT, ON
-031	IN3-14, OPT MODE, SW2
-032	DOWNLINK, ENABLE SW
-033	LOAD, CHAN A, 200 OHMS
-034	SCOPE, PROBES, 1 : 1
-035	SP1
-036	SP2
-037	SP3
-038	SP4
-039	SP5
-040	SP6
-041	SP7
-042	SP8
-043	SP9
-044	SP10
-045	SP11
-046	SP12
-047	SP13
-048	SP14
-049	SP15
-050	LENS, MARKED SP16

# COMMAS INDICATE DIVISIONS BETWEEN ROWS OF WORDS OR LETTER GROUPS ONLY AND ARE NOT PART OF THE LEGEND.

DASH NO.	DESCRIPTION #
-051	LENS, MARKED SP17
-052	+ AND -, AGC INPUT, COUNTERS
-053	SP19
-054	FORCED, LOAD
-055	FORCED, READ
-056	TAPE, FREE, RUN
-057	INHIBIT, BANK, RESTORE
-058	CH30-1, INO-1
-059	CH30-2, INO-2
-060	CH30-3, INO-3
-061	CH30-4, INO-4
-062	CH30-5, INO-5
-063	CH30-6, INO-6
-064	CH30-7, INO-7
-065	CH30-8, INO-8
-066	CH30-9, INO-9
-067	CH30-10, INO-10
-068	CH30-11, INO-11
-069	CH30-12, INO-12
-070	CH30-13, INO-13
-071	CH30-14, INO-14
-072	CH30-15, INO-15
-073	CH31-1, IN2-1
-074	CH31-2, IN2-2
-075	CH31-3, IN2-3
-076	CH31-4, IN2-4
-077	CH31-5, IN2-5
-078	CH31-6, IN2-6
-079	CH31-7, IN2-7
-080	CH31-8, IN2-8
-081	CH31-9, IN2-9
-082	CH31-10, IN2-10
-083	CH31-11, IN2-11
-084	CH31-12, IN2-12
-085	CH31-13, IN2-13
-086	CH31-14, IN2-14
-087	CH31-15, IN2-15
-088	CH32-1, IN3-1
-089	CH32-2, IN3-2
-090	CH32-3, IN3-3
-091	CH32-4, IN3-4
-092	CH32-5, IN3-5
-093	LENS, MARKED CH32-6, IN3-6

1006405 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/16/65	A Harano
1	REVISED PER CCA R25233 DR J. Doty CHK J Gilreath APPD	27 Oct 65	
2	REVISED PER CCA R25355 DR P. Milano CHK S.J. Rozanski APPD	11/11/65	8 F.8
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26235 DR W. Brown CHK APPD & maynard	3/24/66	

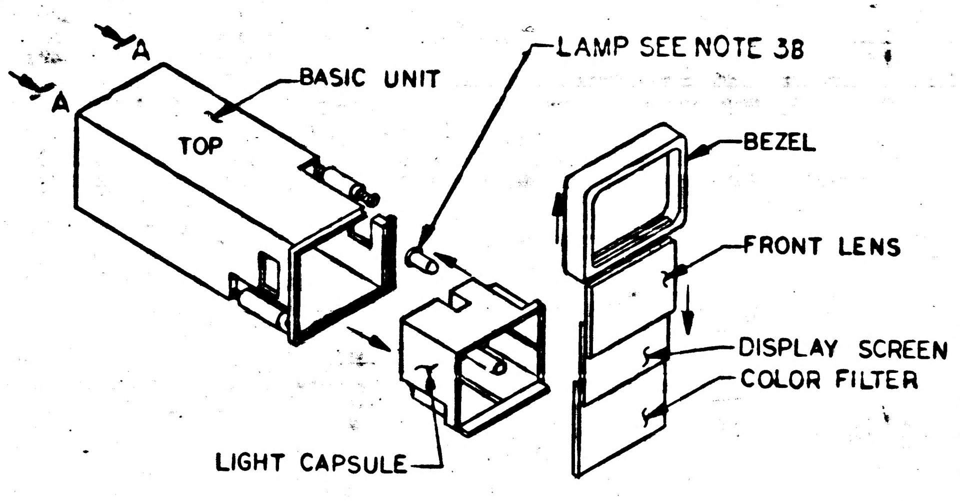
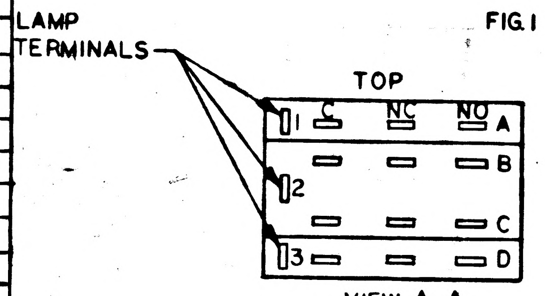


FIG.1



VIEW A-A ENLARGED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON

DECIMALS	DECIMALS	ANGLES
.XX ±	.XXX ±	±

DO NOT SCALE DRAWING

MATERIAL

SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.

CONTRACT NO. NAS 9-497

DRAWN SJ Baron DATE 6 JULY 65

CHECKED A. Kufser 14AUG65

APPROVAL 9/9/65

APPROVAL D. O'Bryan 9/14/65

APPROVAL M.J. Bonin 9/16/65

NASA APPROVAL A. C. METZGER

MIT APPROVAL W Kupfer 7 Dec 65

MIT APPROVAL A Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006405

SCALE NONE WT SHEET 2 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCPIBED BY MIL-D-70327

1006405 A

DASH NO.	DESCRIPTION #
-094	LENS, MARKED CH32-7, IN3-7
-095	CH32-8, IN3-8
-096	CH32-9, IN3-9
-097	CH32-10, IN3-10
-098	CH32-11, IN3-11
-099	CH32-12, IN3-12
-100	CH32-13, IN3-13
-101	CH32-14, IN3-14
-102	CH32-15, IN3-15
-103	CH33-1
-104	CH33-2
-105	CH33-3
-106	CH33-4
-107	CH33-5
-108	CH33-6
-109	CH33-7
-110	CH33-8
-111	CH33-9
-112	CH33-10
-113	CH33-11
-114	CH33-12
-115	CH33-13
-116	CH33-14
-117	CH33-15
-118	CH16-1
-119	CH16-2
-120	CH16-3
-121	CH16-4
-122	CH16-5
-123	CH16-6
-124	CH16-7
-125	PITCH
-126	YAW
-127	ROLL
-128	HC, ENABLE
-129	REVERSE, PHASE
-130	HC, SELF TEST
-131	LOAD, CHAN V, 1K OHMS
-132	LOAD, CHAN V, 2K OHMS
-133	LOAD, CHAN V, 20K OHMS
-134	TC, TEST
-135	SINGLE, PULSE
-136	TWO, PULSE
-137	OUT IN
-138	TAPE, READER
-139	STANDARD, RATE
-140	ALARM, RATE
-141	POSITIVE
-142	NEGATIVE
-143	LENS, MARKED PIPA, FREE RUN

DASH NO.	DESCRIPTION #
-144	LENS, MARKED POSITIVE, NEGATIVE
-145	WORD, RATE, 10 PPS
-146	WORD, RATE, 50 PPS
-147	WORD, RATE, 300 PPS
-148	DL, ENABLE
-149	MARGIN, CONTROL
-150	LOAD, CHAN S, 200 OHMS
-151	LOAD, CHAN S, 510 OHMS
-152	LOAD, CHAN T, 200 OHMS
-153	LOAD, CHAN T, 510 OHMS
-154	SELF, TEST
-155	BLK-1
-156	WA
-157	WX, RULOG
-158	WG5, RLG
-159	WS
-160	WCH
-161	FREE, RUN
-162	T7
-163	WZ
-164	WY
-165	WG6, ST3
-166	WFBK
-167	RCH
-168	T1
-169	T8
-170	WB
-171	WLP, WL
-172	RGG
-173	RPTR, WEBK
-174	PGT, GP
-175	T4
-176	T9
-177	WQ
-178	WG4, WG
-179	WALPG, RAG
-180	WBB
-181	REC, TEST
-182	ST1
-183	INHIBIT, POWER, FAIL
-184	LOAD, CHAN T, 200 OHMS
-185	LENS, MARKED TWO, PHASE

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER GCA R25188	9/16/65	O. Harano
1	REVISED PER GCA 25233 DR J. Doty CHK J Gilreath APPD Handley	27 OCT 65	
2	REVISED PER GCA 25355 DR P. Milano CHK S.J. Ponzeski APPD Handley	11/11/65	SFB
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26235 DR J.P. Leonard CHK APPD H. Maynard	2/24/66	

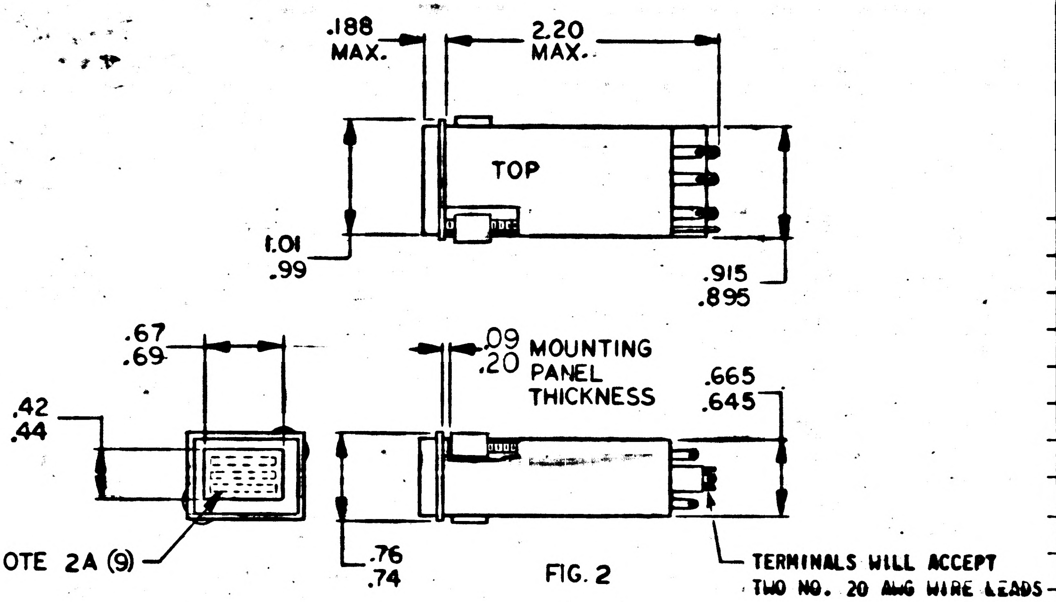


FIG. 2

DASH NO.	DESCRIPTION
[illegible]	LENS, [illegible] OHMS
[illegible]	LENS
[illegible]	COLOR FILTER - FULL [illegible]
[illegible]	" " " RED
[illegible]	" " " GREEN
[illegible]	LENS, [illegible] TEST

BLANK LENS

[illegible]

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S.J. Baran DATE JULY 65
CHECKED A. Kuhn 14 AUG 65
APPROVAL 9/14/65
APPROVAL D. Bryant 9/14/65
APPROVAL 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 12/6/65
MIT APPROVAL O. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4 PDT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006405
SCALE NONE
WT
SHEET 3 OF 4

1006405 A

1006405 A

REVISIONS 26235			
SYM	DESCRIPTION	DATE	APPROVED
A	THIS SHEET ADDED PER TDRR 26235		

DASH NO.	DESCRIPTION #
-186	LENS, MARKED LOAD, CHAN V, 510 OHMS
-187	LENS
-188	COLOR FILTER - FULL AMBER
-189	COLOR FILTER - FULL RED
-190	COLOR FILTER - FULL GREEN
-191	LENS, MARKED SCALER, FREQ, TEST
-192	LENS, MARKED BLOCK II, PIPA
-193	LENS, MARKED CNTRL 1, ACE
-194	LENS, MARKED CNTRL 2, ACE
-195	LENS, MARKED INHIBIT, PWR FAIL
-196	LENS, MARKED LOAD, CHAN V, 200 OHMS
-197	LENS, MARKED LOAD, CHAN V, 510 OHMS

Ⓐ THIS SHEET ADDED

1006405 A

• BLANK LENS

COMMAS INDICATE DIVISIONS BETWEEN ROWS OF WORDS OR LETTER GROUPS ONLY & ARE NOT PART OF THE LEGEND.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN A.J. Bizon DATE 7 FEB 66
CHECKED 10Feb66
APPROVAL P. Frazier 2/8/66
APPROVAL D. O'Bryant 2/7/66
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL 10Feb66
MIT APPROVAL 2/11/66

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006405

SCALE NONE WT SHEET 4 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 02630

REQUIREMENTS:

1. GENERAL:
   - A. SWITCHES SHALL CONFORM TO THE REQUIREMENTS OF MIL-S-22885 AND THE REQUIREMENTS HEREIN.
   - B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - C. PART MARKING: SWITCH BODIES SHALL BE MARKED WITH THE MANUFACTURER'S NAME, PART NUMBER, NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), REVISION LETTER, TERMINAL IDENTITY, AND UNIT ORIENTATION.
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

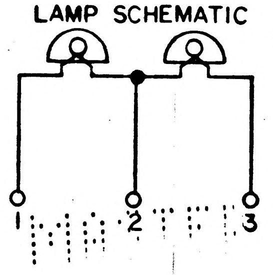
2. ACCEPTANCE AND INSPECTION: SAMPLING.
   - A. MECHANICAL PROPERTIES:
     - (1) DISASSEMBLY FORCE (AXIAL PULL ON LIGHT CAPSULE): 3 POUNDS MAXIMUM.
     - (2) ACTUATING FORCE (AXIAL PUSH ON LIGHT CAPSULE): 1.0 - 4.0 POUNDS.
     - (3) ACTUATOR TRAVEL (NOMINAL): .100 PRETRAVEL, .120 TOTAL.
     - (4) SWITCH ACTUATION INDICATION: BOTH FEEL AND SOUND AS A DEFINITE CHARACTERISTIC.
     - (5) ACTUATOR STRENGTH: 25 POUNDS MINIMUM AXIAL FORCE.
     - (6) OPERATION: THE FOUR SWITCHES (POLES) SHALL BE ON WHEN THE FRONT LENS IS DEPRESSED AND RELEASED AFTER AN INDICATION OF BOTH FEEL AND SOUND. TO TURN SWITCH OFF, ANOTHER ACTUATION IS NECESSARY.
     - (7) ASSEMBLY AND DISASSEMBLY: SEE FIGURE 1. BY REMOVING THE LIGHT CAPSULE (PULL OUT) LAMPS MAY BE REPLACED. WITH THE CAPSULE DISASSEMBLED, THE BEZEL (LENS HOLDER) MAY BE LIFTED UP AND SEPARATED TO ALLOW SERVICING OF COLOR FILTER, DISPLAY SCREEN, AND FRONT LENS.
     - (8) MOUNTING: SWITCHES MOUNT IN A RECTANGULAR HOLE (AS DELINEATED) BY ADJUSTABLE PAWLS, ACTUATED BY SCREWS, ARRANGED SO THAT DIAGONALLY OPPOSITE CORNERS ARE USED ALLOWING CLOSE SIDE-BY-SIDE MULTIPLE MOUNTING.
     - (9) LEGEND: .110 (NOMINAL) HIGH CHARACTERS (.017 NOMINAL LINE WIDTH) REVERSE ENGRAVED AND FILLED BLACK ON THE REAR SURFACE OF THE CLEAR PUSH BUTTON LENS. ALL LINES OF CHARACTERS SHALL BE CENTRALLY LOCATED.
     - (10) TERMINAL STRENGTH: 5 POUNDS MINIMUM AXIAL LOAD APPLIED WITHOUT SHOCK.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) SWITCH CONTACT ARRANGEMENT: 4 PDT ALTERNATING ON-OFF.
     - (2) CONTACT RESISTANCE: 100 MILLIOHMS MAXIMUM AT 100 MILLI-AMPERES DC WHEN 2 VOLTS ARE APPLIED THRU A SUITABLE RESISTOR. THE SWITCHES MAY BE OPERATED 5 TIMES PRIOR TO MEASUREMENT.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).
     - (4) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 500 VDC BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:
     - (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

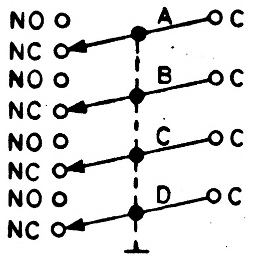
3. DESIGN:
   - A. OPERATING LIFE: 100,000 CYCLES MINIMUM OF MECHANICAL OPERATION (25,000 CYCLES UNDER A RESISTIVE LOAD). A CYCLE SHALL BE TWO PUSHES OF ACTUATOR i.e. THE COUNTER WOULD BE SET UP ON ONE SWITCH TERMINAL.
   - B. CONSTRUCTION AND MATERIAL: A BASIC UNIT HOUSING WITH SWITCHES AND A REMOVABLE LENS AND LIGHT CAPSULE ASSEMBLY (SEE FIGURE 1). THE LIGHT CAPSULE ACCOMODATES TWO T-1 3/4 MIDGET FLANGED BASE LAMPS. (LAMPS NOT SUPPLIED)
     - (1) HOUSING: CORROSION-RESISTING STEEL
     - (2) LIGHT CAPSULE AND SWITCH DIELECTRIC: DIALLYL PHTHALATE
     - (3) BEZEL OR LENS HOLDER: NYLON (ZYTEL)
     - (4) FRONT LENS, DISPLAY SCREEN, AND COLOR FILTER: ACRYLIC
   - C. ELECTRICAL RATINGS (SWITCH CONTACTS):
     - (1) 4.0 AMPERES AT 28 VDC RESISTIVE LOAD.
     - (2) 2.5 AMPERES AT 28 VDC INDUCTIVE LOAD.
     - (3) 1.0 AMPERE AT 28 VDC LAMP LOAD.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

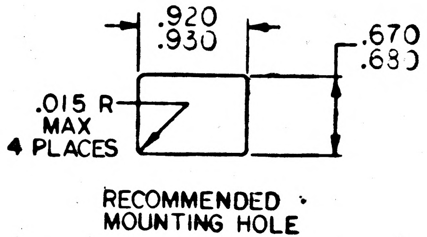
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/16/65	A. Harano
1	REVISED PER CCA R25233 DR J. Doty CHK J. Gilbreath APPD	27 Oct 65	
2	REVISED PER CCA R25355 DR P. Milant CHK S. J. [illegible] APPD	11/11/65	
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26235 DR W. Brown CHK APPD H. Maynard	7/26/66	
B	REVISED PER TDRR 26686 DR [illegible] CHK [illegible] APPD H. Maynard		





SWITCH SCHEMATIC



RECOMMENDED MOUNTING HOLE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±
DECIMALS .xxx ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S. J. Baran DATE 6 JULY 65
CHECKED A. Kupen 14 AUG 65
APPROVAL V. F. Cocuzza 9-10-65
APPROVAL D. O'Brien 9/14/65
APPROVAL 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Harano 9/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006405
SCALE NONE
WT
SHEET 1 OF 4

DASH NO.	DESCRIPTION #
-001	BASIC UNIT - 4PDT SWITCH AND LIGHT CAPSULE
-002	COLOR FILTER - FULL WHITE
-003	DISPLAY SCREEN - FULL
-004	LENS, MARKED SCALER, FREQ, TEST
-005	IN0-7, INHIBIT, UPSYNC
-006	IN0-11, G/N ATT, CONT MODE
-007	IN0-12, G/N ΔV, MODE
-008	IN0-13, G/N ENTRY, MODE
-009	IN0-15, MARK
-010	IN2-5, LIFT OFF
-011	IN2-6, GUIDANCE, RELEASE
-012	IN2-7, SATURN, ULLAGE
-013	IN2-8, S IV B, SEPARATE
-014	IN2-9, SM/CM, SEPARATE
-015	IN2-10, CDU FAIL
-016	IN2-11, PIPA FAIL
-017	IN2-12, IMU FAIL
-018	IN2-13, SCS ΔV, MODE
-019	IN2-14, G/N MON , MODE
-020	IN3-1, K1
-021	IN3-2, K2
-022	IN3-3, K3
-023	IN4-4, K4
-024	IN3-5, K12
-025	IN3-6, TRANSFER, SWITCH
-026	IN3-7, K5
-027	IN3-10, OPT MODE, SW3
-028	IN3-11, STAR PRES
-029	IN3-12, ZERO OPT
-030	IN3-13, SEXTANT, ON
-031	IN3-14, OPT MODE, SW2
-032	DOWNLINK, ENABLE SW
-033	LOAD, CHAN A, 200 OHMS
-034	SCOPE, PROBES, 1 : 1
-035	SP1
-036	SP2
-037	SP3
-038	SP4
-039	SP5
-040	SP6
-041	SP7
-042	SP8
-043	SP9
-044	SP10
-045	SP11
-046	SP12
-047	SP13
-048	SP14
-049	SP15
-050	LENS, MARKED SP16

COMMAS INDICATE DIVISIONS BETWEEN ROWS OF WORDS OR LETTER GROUPS ONLY AND ARE NOT PART OF THE LEGEND.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DASH NO.	DESCRIPTION #
-051	LENS, MARKED SP17
-052	+ AND -, AGC INPUT, COUNTERS
-053	SP19
-054	FORCED, LOAD
-055	FORCED, READ
-056	TAPE, FREE, RUN
-057	INHIBIT, BANK, RESTORE
-058	CH30-1, IN0-1
-059	CH30-2, IN0-2
-060	CH30-3, IN0-3
-061	CH30-4, IN0-4
-062	CH30-5, IN0-5
-063	CH30-6, IN0-6
-064	CH30-7, IN0-7
-065	CH30-8, IN0-8
-066	CH30-9, IN0-9
-067	CH30-10, IN0-10
-068	CH30-11, IN0-11
-069	CH30-12, IN0-12
-070	CH30-13, IN0-13
-071	CH30-14, IN0-14
-072	CH30-15, IN0-15
-073	CH31-1, IN2-1
-074	CH31-2, IN2-2
-075	CH31-3, IN2-3
-076	CH31-4, IN2-4
-077	CH31-5, IN2-5
-078	CH31-6, IN2-6
-079	CH31-7, IN2-7
-080	CH31-8, IN2-8
-081	CH31-9, IN2-9
-082	CH31-10, IN2-10
-083	CH31-11, IN2-11
-084	CH31-12, IN2-12
-085	CH31-13, IN2-13
-086	CH31-14, IN2-14
-087	CH31-15, IN2-15
-088	CH32-1, IN3-1
-089	CH32-2, IN3-2
-090	CH32-3, IN3-3
-091	CH32-4, IN3-4
-092	CH32-5, IN3-5
-093	LENS, MARKED CH32-6, IN3-6

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/16/65	A Harano
1	REVISED PER CCA R25233 DR J. Doty CHK J Gilreath APPD Hardy	27 Oct 65	S.F.S
2	REVISED PER GCA R25355 DR P. Milan CHK S.J. Rozanski APPD Hardy	11/11/65	S.F.S
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26235 DR W. Brown CHK [illegible] APPD H Maynard	3/24/66	[illegible]
B	REVISED PER TDRR 26686 DR [illegible] CHK [illegible] APPD H. Maynard		

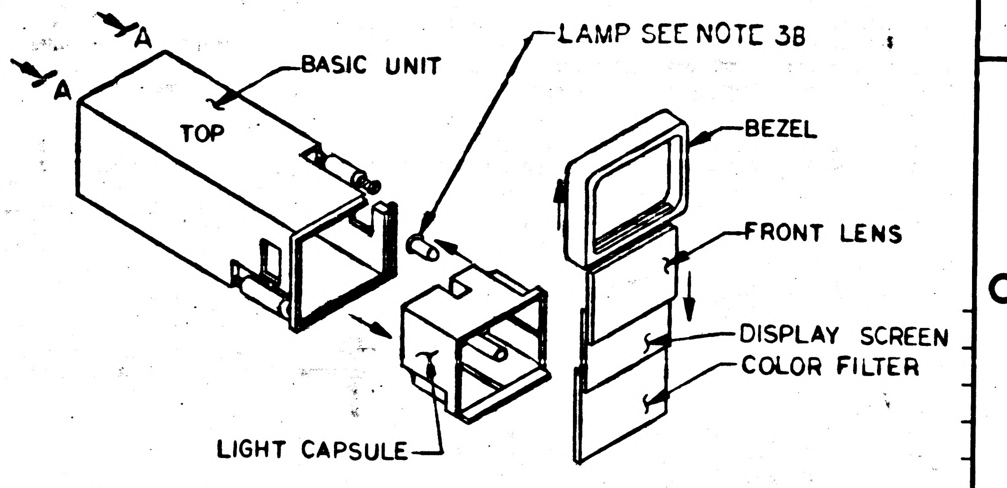
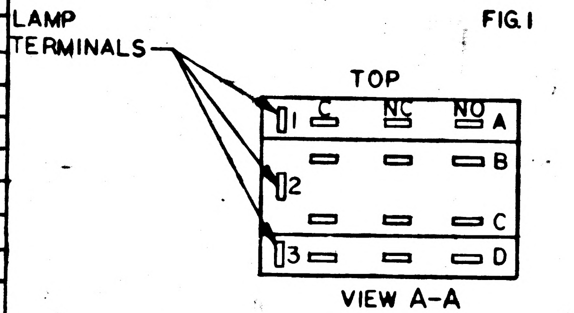


FIG. I



VIEW A-A
ENLARGED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S.J. Baran DATE JULY 65
CHECKED A. Kuper 14 AUG 65
APPROVAL [illegible] 9/16/65
APPROVAL D. O'Bryan 9/14/65
APPROVAL M.J. Bonin 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL [illegible]
MIT APPROVAL A Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006405
SCALE NONE	WT	SHEET 2 OF 4

DASH NO.	DESCRIPTION #	
-094	LENS, MARKED	CH32-7, IN3-7
-095		CH32-8, IN3-8
-096		CH32-9, IN3-9
-097		CH32-10, IN3-10
-098		CH32-11, IN3-11
-099		CH32-12, IN3-12
-100		CH32-13, IN3-13
-101		CH32-14, IN3-14
-102		CH32-15, IN3-15
-103		CH33-1
-104		CH33-2
-105		CH33-3
-106		CH33-4
-107		CH33-5
-108		CH33-6
-109		CH33-7
-110		CH33-8
-111		CH33-9
-112		CH33-10
-113		CH33-11
-114		CH33-12
-115		CH33-13
-116		CH33-14
-117		CH33-15
-118		CH16-1
-119		CH16-2
-120		CH16-3
-121		CH16-4
-122		CH16-5
-123		CH16-6
-124		CH16-7
-125		PITCH
-126		YAW
-127		ROLL
-128		HC, ENABLE
-129		REVERSE, PHASE
-130		HC, SELF TEST
-131		LOAD, CHAN V, 1K OHMS
-132		LOAD, CHAN V, 2K OHMS
-133		LOAD, CHAN V, 20K OHMS
-134		TC, TEST
-135		SINGLE, PULSE
-136		TWO, PULSE
-137		OUT IN
-138		TAPE, READER
-139		STANDARD, RATE
-140		ALARM, RATE
-141		POSITIVE
-142		NEGATIVE
-143	LENS, MARKED	PIPA, FREE RUN

DASH NO.	DESCRIPTION #	
-144	LENS, MARKED	POSITIVE, NEGATIVE
-145		WORD, RATE, 10 PPS
-146		WORD, RATE, 50 PPS
-147		WORD, RATE, 300 PPS
-148		DL, ENABLE
-149		MARGIN, CONTROL
-150		LOAD, CHAN S, 200 OHMS
-151		LOAD, CHAN S, 510 OHMS
-152		LOAD, CHAN T, 200 OHMS
-153		LOAD, CHAN T, 510 OHMS
-154		SELF, TEST
-155		BLK-1
-156		WA
-157		WX, RULOG
-158		WG5, RLG
-159		WS
-160		WCH
-161		FREE, RUN
-162		T7
-163		WZ
-164		WY
-165		WG6, ST3
-166		WFBK
-167		RCH
-168		T1
-169		T8
-170		WB
-171		WLP, WL
-172		RGG
-173		RPTR, WEBK
-174		PGT, GP
-175		T4
-176		T9
-177		WQ
-178		W64, WG
-179		WALPG, RAG
-180		WBB
-181		REC, TEST
-182		ST1
-183		INHIBIT, POWER, FAIL
-184		LOAD, CHAN V, 200 OHMS
-185	LENS, MARKED	TWO, PHASE

1006405 B

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER ~~CCA~~ R25/813	9/16/65	A. Harano
1	REVISED PER CCA 25233 DR J. Daty CHK J Gilweath APPD Handley	27 OCT 65	
2	REVISED PER OCA 25355 DR P. Milano CHK S.J. Cozarski APPD	11/1/65	S.F.B
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26235 DR J.P. Leonard CHK APPD H. Maynard	2/24/66	
B	REVISED PER TDRR 26686 DR CHK APPD H. Maynard		

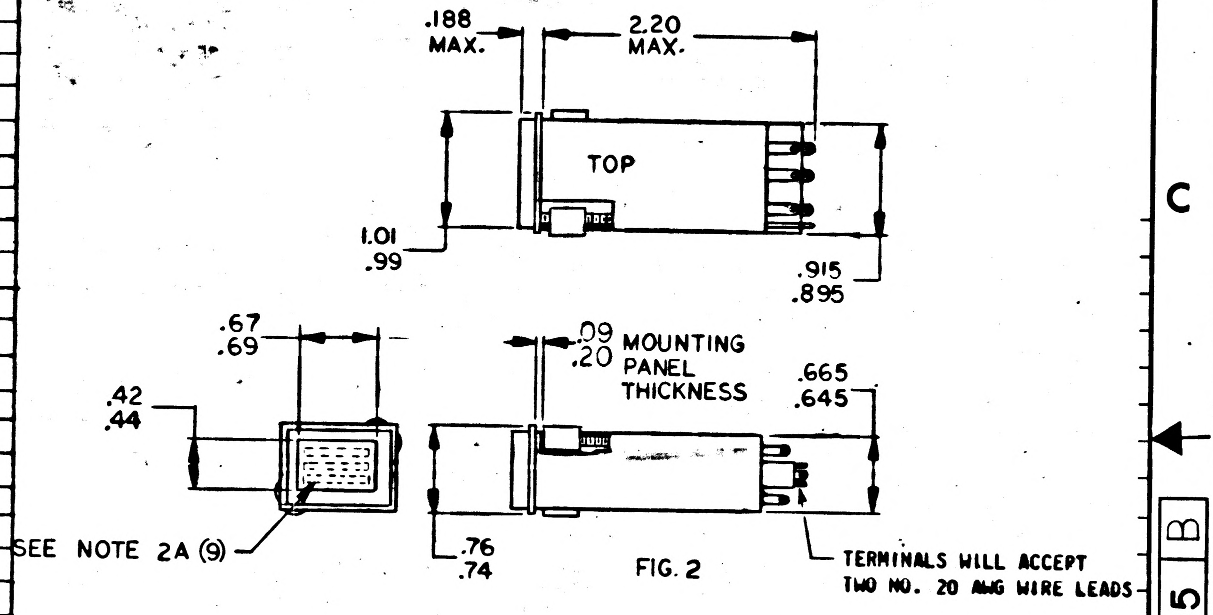


FIG. 2

1006405 B

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S.J. Baran DATE 6 JULY 65
CHECKED A. Fuchs 14 AUG 65
APPROVAL 9-14-65
APPROVAL D. S. Bryant 9/14/65
APPROVAL 9/14/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4 PDT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006405
SCALE NONE
WT
SHEET 3 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006405 B

DASH NO.	DESCRIPTION #
-186	LENS, MARKED LOAD, CHAN V, 510 OHMS
-187	LENS
-188	COLOR FILTER - FULL AMBER
-189	COLOR FILTER - FULL RED
-190	COLOR FILTER - FULL GREEN
-191	LENS, MARKED SCALER, FREQ, TEST
-192	LENS, MARKED BLOCK II, PIPA
-193	LENS, MARKED CNTRL 1, ACE
-194	LENS, MARKED CNTRL 2, ACE
-195	LENS, MARKED INHIBIT, PWR FAIL
-196	LENS, MARKED LOAD, CHAN V, 200 OHMS
-197	LENS, MARKED LOAD, CHAN V, 510 OHMS
-198	LENS, MARKED LOAD, CHAN V, 10K OHMS

REVISIONS 26235

SYM	DESCRIPTION	DATE	APPROVED
A	THIS SHEET ADDED PER TDRR 26235		
B	REVISED PER TDRR 26686 DR S.P. Infiles CHK Cuthman APPD H. Maynard		

Ⓐ THIS SHEET ADDED

1006405 B

• BLANK LENS

COMMAS INDICATE DIVISIONS BETWEEN ROWS OF WORDS OR LETTER GROUPS ONLY & ARE NOT PART OF THE LEGEND.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.

CONTRACT NO. NAS9-497
DRAWN A.J. Biron DATE 7 FEB 66
CHECKED 10 Feb 66
APPROVAL P. Frazier 2/8/66
APPROVAL D. O'Bryant H. Maynard
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL 15 Feb 66
MIT APPROVAL 2/11/66

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006405
SCALE NONE	WT	SHEET 4 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 03630

REQUIREMENTS:

1. GENERAL:

   A. SWITCHES SHALL CONFORM TO THE REQUIREMENTS OF MIL-S-22885 AND THE REQUIREMENTS HEREIN.

   B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

   C. PART MARKING: SWITCH BODIES SHALL BE MARKED WITH THE MANUFACTURER'S NAME, PART NUMBER, NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), REVISION LETTER, TERMINAL IDENTITY, AND UNIT ORIENTATION.

   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLING.

   A. MECHANICAL PROPERTIES:

      (1) DISASSEMBLY FORCE (AXIAL PULL ON LIGHT CAPSULE): 3 POUNDS MAXIMUM.

      (2) ACTUATING FORCE (AXIAL PUSH ON LIGHT CAPSULE): 1.0 - 4.0 POUNDS.

      (3) ACTUATOR TRAVEL (NOMINAL): .100 PRETRAVEL, .120 TOTAL.

      (4) SWITCH ACTUATION INDICATION: BOTH FEEL AND SOUND AS A DEFINITE CHARACTERISTIC.

      (5) ACTUATOR STRENGTH: 25 POUNDS MINIMUM AXIAL FORCE.

      (6) OPERATION: THE FOUR SWITCHES (POLES) SHALL BE ON WHEN THE FRONT LENS IS DEPRESSED AND RELEASED AFTER AN INDICATION OF BOTH FEEL AND SOUND. TO TURN SWITCH OFF, ANOTHER ACTUATION IS NECESSARY.

      (7) ASSEMBLY AND DISASSEMBLY: SEE FIGURE 1. BY REMOVING THE LIGHT CAPSULE (PULL OUT) LAMPS MAY BE REPLACED. WITH THE CAPSULE DISASSEMBLED, THE BEZEL (LENS HOLDER) MAY BE LIFTED UP AND SEPARATED TO ALLOW SERVICING OF COLOR FILTER, DISPLAY SCREEN, AND FRONT LENS.

      (8) MOUNTING: SWITCHES MOUNT IN A RECTANGULAR HOLE (AS DELINEATED) BY ADJUSTABLE PAWLS, ACTUATED BY SCREWS, ARRANGED SO THAT DIAGONALLY OPPOSITE CORNERS ARE USED ALLOWING CLOSE SIDE-BY-SIDE MULTIPLE MOUNTING.

      (9) LEGEND: .110 (NOMINAL) HIGH CHARACTERS (.017 NOMINAL LINE WIDTH) REVERSE ENGRAVED AND FILLED BLACK ON THE REAR SURFACE OF THE CLEAR PUSH BUTTON LENS. ALL LINES OF CHARACTERS SHALL BE CENTRALLY LOCATED.

      (10) TERMINAL STRENGTH: 5 POUNDS MINIMUM AXIAL LOAD APPLIED WITHOUT SHOCK.

   B. ELECTRICAL CHARACTERISTICS:

      (1) SWITCH CONTACT ARRANGEMENT: 4 PDT ALTERNATING ON-OFF.

      (2) CONTACT RESISTANCE: 100 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES DC WHEN 2 VOLTS ARE APPLIED THRU A SUITABLE RESISTOR. THE SWITCHES MAY BE OPERATED 5 TIMES PRIOR TO MEASUREMENT.

      (3) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).

      (4) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 500 VDC BETWEEN ALL TERMINALS AND GROUNDED CASE AND BETWEEN ALL MUTUALLY INSULATED TERMINALS (BOTH POSITIONS).

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

      (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS.

3. DESIGN:

   A. OPERATING LIFE: 100,000 CYCLES MINIMUM OF MECHANICAL OPERATION (25,000 CYCLES UNDER A RESISTIVE LOAD). A CYCLE SHALL BE TWO PUSHES OF ACTUATOR i.e. THE COUNTER WOULD BE SET UP ON ONE SWITCH TERMINAL.

   B. CONSTRUCTION AND MATERIAL: A BASIC UNIT HOUSING WITH SWITCHES AND A REMOVABLE LENS AND LIGHT CAPSULE ASSEMBLY (SEE FIGURE 1). THE LIGHT CAPSULE ACCOMODATES TWO T-1$\frac{3}{4}$ MIDGET FLANGED BASE LAMPS. (LAMPS NOT SUPPLIED)

      (1) HOUSING: CORROSION-RESISTING STEEL

      (2) LIGHT CAPSULE AND SWITCH DIELECTRIC: DIALLYL PHTHALATE

      (3) BEZEL OR LENS HOLDER: NYLON (ZYTEL)

      (4) FRONT LENS, DISPLAY SCREEN, AND COLOR FILTER: ACRYLIC

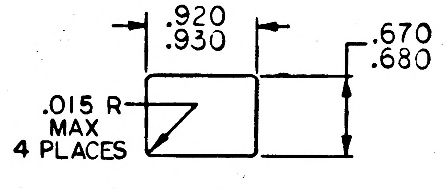
   C. ELECTRICAL RATINGS (SWITCH CONTACTS):

      (1) 4.0 AMPERES AT 28 VDC RESISTIVE LOAD.

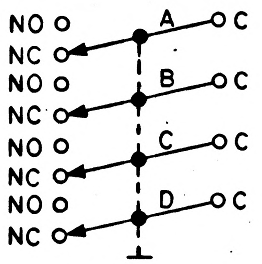
      (2) 2.5 AMPERES AT 28 VDC INDUCTIVE LOAD.

      (3) 1.0 AMPERE AT 28 VDC LAMP LOAD.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

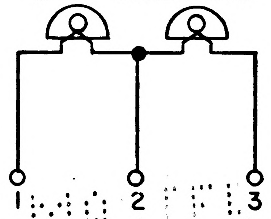


RECOMMENDED MOUNTING HOLE



SWITCH SCHEMATIC

LAMP SCHEMATIC



REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/16/65	A. Harano
1	REVISED PER CCA R25233 DR J. Doty CHK J. Gilreath APPD Hardy	27 Oct 65	S.J.S.
2	REVISED PER CCA R25355 DR P. Milant CHK S.J. Kozanski APPD Hardy	11/11/65	S.J.S.
—	RELEASED CLASS A PER TDRR 24524		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S.J. Baron DATE 6 JULY 65
CHECKED A. Kufer 14 AUG 65
APPROVAL V F Correia 9-10-65
APPROVAL D. O'Bryant 9/14/65
APPROVAL M J Barr 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Harano 9/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006405
SCALE NONE	WT	SHEET 1 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

— | 1006405

DASH NO.	DESCRIPTION #
-001	BASIC UNIT - 4PDT SWITCH AND LIGHT CAPSULE
-002	COLOR FILTER - FULL WHITE
-003	DISPLAY SCREEN - FULL
-004	LENS, MARKED SCALER, FREQ, TEST
-005	IN0-7, INHIBIT, UPSYNC
-006	IN0-11, G/N ATT, CONT MODE
-007	IN0-12, G/N ΔV, MODE
-008	IN0-13, G/N ENTRY, MODE
-009	IN0-15, MARK
-010	IN2-5, LIFT OFF
-011	IN2-6, GUIDANCE, RELEASE
-012	IN2-7, SATURN, ULLAGE
-013	IN2-8, S IV B, SEPARATE
-014	IN2-9, SM/CM, SEPARATE
-015	IN2-10, CDU FAIL
-016	IN2-11, PIPA FAIL
-017	IN2-12, IMU FAIL
-018	IN2-13, SCS ΔV, MODE
-019	IN2-14, G/N MON , MODE
-020	IN3-1, K1
-021	IN3-2, K2
-022	IN3-3, K3
-023	IN4-4, K4
-024	IN3-5, K12
-025	IN3-6, TRANSFER, SWITCH
-026	IN3-7, K5
-027	IN3-10, OPT MODE, SW3
-028	IN3-11, STAR PRES
-029	IN3-12, ZERO OPT
-030	IN3-13, SEXTANT, ON
-031	IN3-14, OPT MODE, SW2
-032	DOWNLINK, ENABLE SW
-033	LOAD, CHAN A, 200 OHMS
-034	SCOPE, PROBES, 1 : 1
-035	SP1
-036	SP2
-037	SP3
-038	SP4
-039	SP5
-040	SP6
-041	SP7
-042	SP8
-043	SP9
-044	SP10
-045	SP11
-046	SP12
-047	SP13
-048	SP14
-049	SP15
-050	LENS, MARKED SP16

DASH NO.	DESCRIPTION #
-051	LENS, MARKED SP17
-052	+ AND -, AGC INPUT, COUNTERS
-053	SP19
-054	FORCED, LOAD
-055	FORCED, READ
-056	TAPE, FREE, RUN
-057	INHIBIT, BANK, RESTORE
-058	CH30-1, IN0-1
-059	CH30-2, IN0-2
-060	CH30-3, IN0-3
-061	CH30-4, IN0-4
-062	CH30-5, IN0-5
-063	CH30-6, IN0-6
-064	CH30-7, IN0-7
-065	CH30-8, IN0-8
-066	CH30-9, IN0-9
-067	CH30-10, IN0-10
-068	CH30-11, IN0-11
-069	CH30-12, IN0-12
-070	CH30-13, IN0-13
-071	CH30-14, IN0-14
-072	CH30-15, IN0-15
-073	CH31-1, IN2-1
-074	CH31-2, IN2-2
-075	CH31-3, IN2-3
-076	CH31-4, IN2-4
-077	CH31-5, IN2-5
-078	CH31-6, IN2-6
-079	CH31-7, IN2-7
-080	CH31-8, IN2-8
-081	CH31-9, IN2-9
-082	CH31-10, IN2-10
-083	CH31-11, IN2-11
-084	CH31-12, IN2-12
-085	CH31-13, IN2-13
-086	CH31-14, IN2-14
-087	CH31-15, IN2-15
-088	CH32-1, IN3-1
-089	CH32-2, IN3-2
-090	CH32-3, IN3-3
-091	CH32-4, IN3-4
-092	CH32-5, IN3-5
-093	LENS, MARKED CH32-6, IN3-6

COMMAS INDICATE DIVISIONS BETWEEN ROWS OF WORDS OR LETTER GROUPS ONLY AND ARE NOT PART OF THE LEGEND.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/16/65	G Harano
1	REVISED PER CCA R25233 DR J. Doty CHK J Gilreath APPD	27 Oct 65	
2	REVISED PER GCA R25355 DR P. Milano CHK S.J. Rozanski APPD	11/11/65	
—	RELEASED CLASS A PER TDRR 24524		

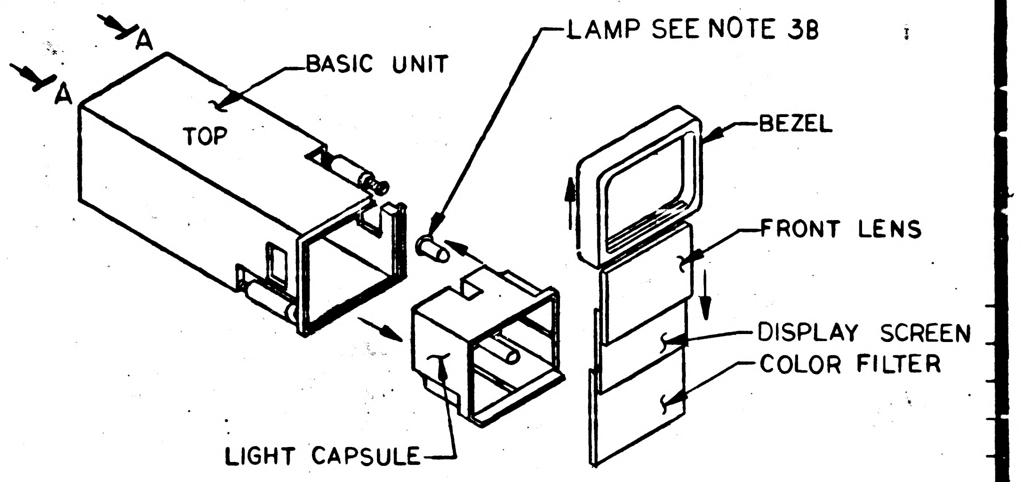
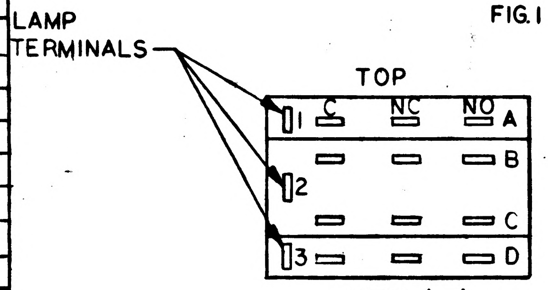


FIG. 1



VIEW A-A ENLARGED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S.J. Baron DATE July 65
CHECKED A. Kuhn 14 AUG 65
APPROVAL 9/16/65
APPROVAL D. O'Bryan 9/14/65
APPROVAL M.J. Bonin 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Kupfer 7 Dec 65
MIT APPROVAL G. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4PDT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006405
SCALE NONE
WT
SHEET 2 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	1006405

DASH NO.	DESCRIPTION #
-094	LENS, MARKED CH32-7, IN3-7
-095	CH32-8, IN3-8
-096	CH32-9, IN3-9
-097	CH32-10, IN3-10
-098	CH32-11, IN3-11
-099	CH32-12, IN3-12
-100	CH32-13, IN3-13
-101	CH32-14, IN3-14
-102	CH32-15, IN3-15
-103	CH33-1
-104	CH33-2
-105	CH33-3
-106	CH33-4
-107	CH33-5
-108	CH33-6
-109	CH33-7
-110	CH33-8
-111	CH33-9
-112	CH33-10
-113	CH33-11
-114	CH33-12
-115	CH33-13
-116	CH33-14
-117	CH33-15
-118	CH16-1
-119	CH16-2
-120	CH16-3
-121	CH16-4
-122	CH16-5
-123	CH16-6
-124	CH16-7
-125	PITCH
-126	YAW
-127	ROLL
-128	HC, ENABLE
-129	REVERSE, PHASE
-130	HC, SELF TEST
-131	LOAD, CHAN V, 1K OHMS
-132	LOAD, CHAN V, 2K OHMS
-133	LOAD, CHAN V, 20K OHMS
-134	TC, TEST
-135	SINGLE, PULSE
-136	TWO, PULSE
-137	OUT IN
-138	TAPE, READER
-139	STANDARD, RATE
-140	ALARM, RATE
-141	POSITIVE
-142	NEGATIVE
-143	LENS MARKED PIPA, FREE RUN

DASH NO.	DESCRIPTION #
-144	LENS, MARKED POSITIVE, NEGATIVE
-145	WORD, RATE, 10 PPS
-146	WORD, RATE, 50 PPS
-147	WORD, RATE, 300 PPS
-148	DL, ENABLE
-149	MARGIN, CONTROL
-150	LOAD, CHAN S, 200 OHMS
-151	LOAD, CHAN S, 510 OHMS
-152	LOAD, CHAN T, 200 OHMS
-153	LOAD, CHAN T, 510 OHMS
-154	SELF, TEST
-155	BLK-1
-156	WA
-157	WX, RULOG
-158	WG5, RLG
-159	WS
-160	WCH
-161	FREE, RUN
-162	T7
-163	WZ
-164	WY
-165	WG6, ST3
-166	WFBK
-167	RCH
-168	T1
-169	T8
-170	WB
-171	WLP, WL
-172	RGG
-173	RPTR, WEBK
-174	PGT, GP
-175	T4
-176	T9
-177	WQ
-178	WG4, WG
-179	WALPG, RAG
-180	WBB
-181	REC, TEST
-182	ST1
-183	INHIBIT, POWER, FAIL
-184	LOAD, CHAN V, 200 OHMS
-185	LENS, MARKED TWO, PHASE

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/16/65	A. Harano
1	REVISED PER CCA 25233 DR J. Doty CHK J Gilreath APPD	27 OCT 65	
2	REVISED PER CCA 25355 DR P. Milano CHK S. J. Rozanski APPD	11/11/65	S.F.B
—	RELEASED CLASS A PER TDRR 24524		

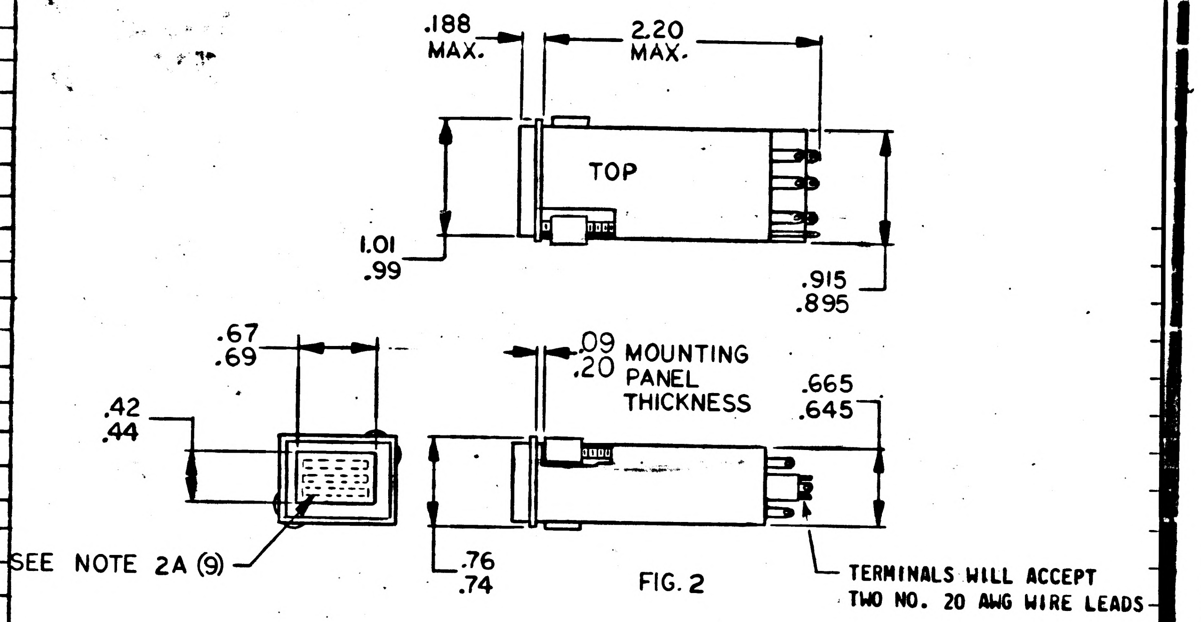


FIG. 2

TERMINALS WILL ACCEPT TWO NO. 20 AWG WIRE LEADS

DASH NO.	DESCRIPTION
-186	LENS, MARKED LOAD, CHAN V, 510 OHMS
-187	LENS *
-188	COLOR FILTER - FULL AMBER
-189	" " " RED
-190	" " " GREEN
-191	LENS, MARKED SCALER, FREQ, TEST

* BLANK LENS

# COMMAS INDICATE DIVISIONS BETWEEN ROWS OF WORDS OR LETTER GROUPS ONLY AND ARE NOT PART OF THE LEGEND.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN S. J. Baran DATE 6 JULY 65
CHECKED A. Kuper 14 AUG 65
APPROVAL [illegible] 9-14-65
APPROVAL D. J. Bryant 9/14/65
APPROVAL M. J. Brun 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL [illegible] 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH, LIGHTED, 4 PDT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006405
SCALE NONE	WT	SHEET 3 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006406

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25175	9/14/65	
—	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

B. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY PER ND 1002019 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, MANUFACTURER'S LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

D. EACH UNIT SHALL BE COMPRISED OF THE FOLLOWING:

ONE (1) OUTER FERRULE
ONE (1) INNER FERRULE

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS SHOWN.

B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS OF THIS DRAWING.

3. DESIGN:

A. MATERIALS:

(1) INSERTS: BRONZE PER ASTM B36, ALLOY NO. 2 (90 CU, 10 ZN)

(2) INSULATOR: NYLON, PER MIL-M-20693, TYPE I.

(3) INNER FERRULE: BRASS OR BRONZE PER ASTM B135 OR B140, FULL HARD (ROCKWELL 70-90).

B. FINISH:

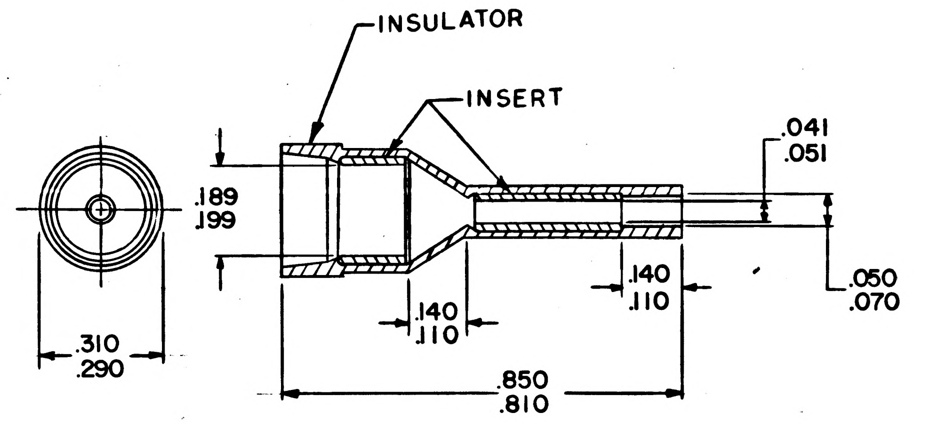
(1) INSERTS: ELECTRO-TIN PLATE, PER MIL-T-10727, TYPE I.

(2) INNER FERRULE:

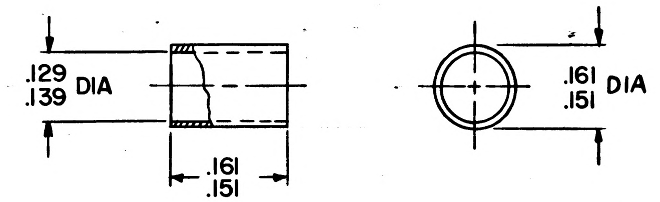
PROTECTIVE: ELECTRO-TIN PLATE, PER MIL-T-10727, TYPE I.

COLOR CODE: ORANGE WAX-BASE DYE, INSOLUBLE IN ETHYL ALCOHOL.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR'S LIST.



OUTER FERRULE



INNER FERRULE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN J. Doty DATE 7/Jul/6.
CHECKED A. Kiefer 18 AUG 65
APPROVAL 9/10/65 W. White 11/23/65
APPROVAL D. O'Bryant 9/10/65
APPROVAL 9/14/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FERRULE, COAXIAL, INSULATED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006406
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	1006410

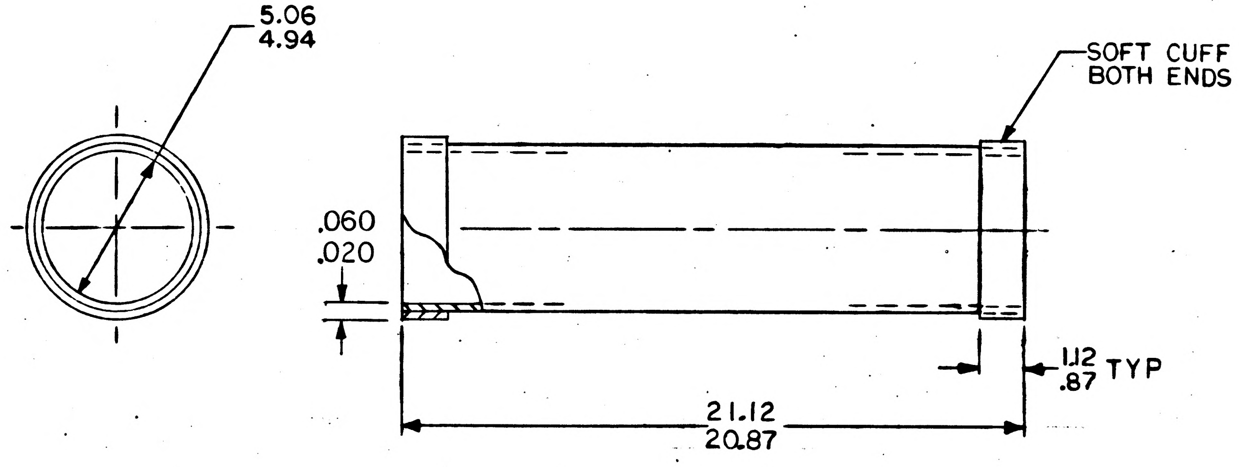
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25108		
1	REVISED PER CCA R25177 DR Ken Bull CHK A. Kuper APPD ASM	5 Oct 65	
2	REVISED PER CCA R25535 DR Jim Doty CHK Wolkowicz APPD ASM		
—	CLASS A RELEASED PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:
   - A. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 4.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. DIMENSIONS: AS SHOWN.
   - B. MARKING: IN ACCORDANCE WITH NOTE 1.B.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:
     - (1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:
   - A. CONSTRUCTION: PLASTIC HELIX, BONDED TO AND SUPPORTING A FLEXIBLE COVER.
   - B. MATERIALS:
     - (1) HELIX: NYLON
     - (2) COVER: FIBER GLASS CLOTH, SINGLE PLY, NEOPRENE-COATED.
   - C. OPERATING TEMPERATURES:
     - (1) MAXIMUM CONTINUOUS: 250 °F
     - (2) MINIMUM: -40°F
   - D. OPERATING PRESSURE: MAXIMUM POSITIVE 5 PSI
   - E. INSIDE BEND RADIUS: MINIMUM 1/2 DUCT DIAMETER.



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN J. Doty GB DATE 12 JUL 65
CHECKED E. Koperk 24 JUL 65
APPROVAL 11/29/65
APPROVAL 8/3/65
APPROVAL 18 Aug 65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HOSE, AIR DUCT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006410
SCALE NONE	WT	SHEET 1 OF 1

—	1006415

REQUIREMENTS:

1. GENERAL:
   - A. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. DIMENSIONS: AS SHOWN.
   - B. MARKING: IN ACCORDANCE WITH NOTE 1.B.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

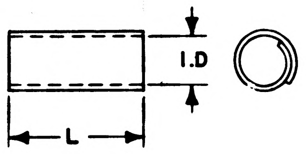
3. DESIGN:
   - A. MATERIAL: RIGID POLYVINYL CHLORIDE.
   - B. CONSTRUCTION: LAMINATED (ROLLED)
   - C. COLOR: YELLOW
   - D. FINISH: MATTE

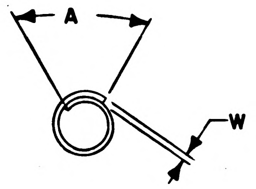
PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DASH NUMBERS								
LENGTH L + 0 - 1/32				WIRE SIZE (REF)		I.D.	WALL THK "W"
1/2	1	1-1/2	2	MIN	MAX		
001	039	077	115	.030	.040	.025	.010
002	040	078	116	.040	.050	.035	.010
003	041	079	117	.050	.060	.045	.011
004	042	080	118	.060	.070	.055	.011
005	043	081	119	.070	.080	.060	.012
006	044	082	120	.080	.090	.070	.012
007	045	083	121	.090	.100	.080	.012
008	046	084	122	.100	.125	.090	.012
009	047	085	123	1/8	5/32	.100	.012
010	048	086	124	5/32	3/16	.125	.012
011	049	087	125	3/16	7/32	.150	.015
012	050	088	126	7/32	1/4	.180	.015
013	051	089	127	1/4	5/16	.210	.015
014	052	090	128	5/16	3/8	.250	.015
015	053	091	129	3/8	7/16	.310	.015
016	054	092	130	7/16	1/2	.375	.020
017	055	093	131	1/2	9/16	.440	.020
018	056	094	132	9/16	5/8	.500	.020
019	057	095	133	5/8	3/4	.560	.020
020	058	096	134	3/4	7/8	.690	.025
021	059	097	135	7/8	1	.750	.025
022	060	098	136	1	1-1/8	.875	.025
023	061	099	137	1-1/8	1-1/4	1.000	.025
024	062	100	138	1-1/4	1-3/8	1.125	.030
025	063	101	139	1-3/8	1-1/2	1.250	.030
026	064	102	140	1-1/2	1-5/8	1.375	.030
027	065	103	141	1-5/8	1-3/4	1.500	.030
028	066	104	142	1-3/4	2	1.625	.035
029	067	105	143	2	2-1/4	1.875	.035
030	068	106	144	2-1/4	2-1/2	2.000	.035
031	069	107	145	2-1/2	2-3/4	2.250	.035
032	070	108	146	2-3/4	3	2.500	.040
033	071	109	147	3	3-1/4	2.750	.040
034	072	110	148	3-1/4	3-1/2	3.000	.040
035	073	111	149	3-1/2	3-3/4	3.250	.045
036	074	112	150	3-3/4	4	3.500	.045
037	075	113	151	4	4-1/2	3.750	.050
038	076	114	152	4-1/2	5	4,000	.050

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	~~CLASS A~~ RELEASE PER ~~TDRR~~ CCA R25077		
-	CLASS A RELEASE PER TDRR 21569	8/17/65	WK.





A= 1/4 OF CIRCUMFERENCE MIN. OVERLAP

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN J. Doty DATE 27 Jul 65
CHECKED 30 JUL 65
APPROVAL 7/30/65
APPROVAL 7/30/65 8/16/65
APPROVAL 7/30/65
NASA APPROVAL 8/17
MIT APPROVAL
MIT APPROVAL 8/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BAND, MARKER, BLANK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006415
SCALE NONE	WT	SHEET 1 OF 1

1006415	—

1006417	–

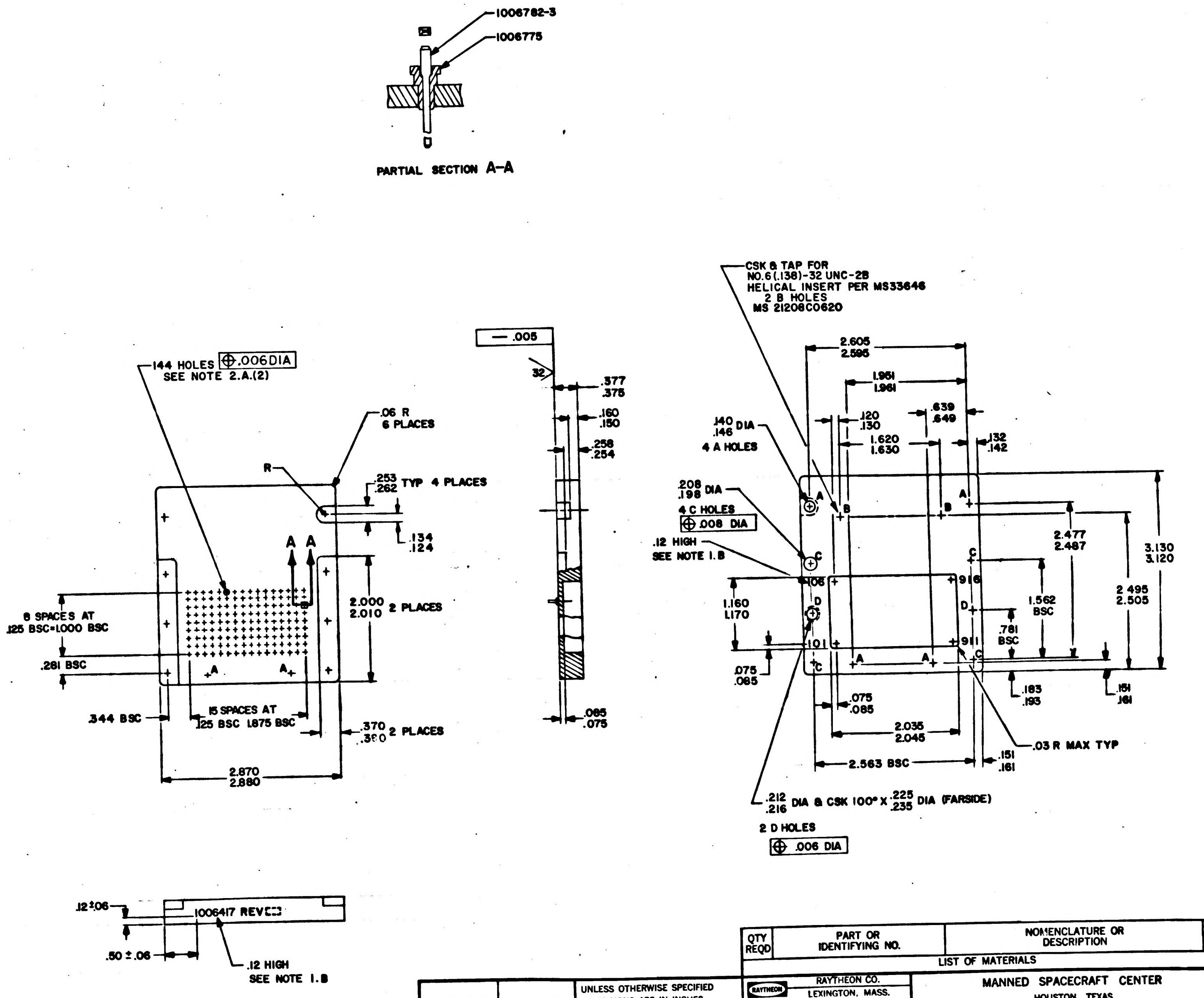
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25205	9-1-65	J. Harami
1	REVISE PER CCA R25316 DR J. Doty CHK J. Fergusin APPD	11-2-65	
–	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:
   - A. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), AND CONTACT IDENTIFICATION AS SHOWN.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
   - D. SUPPLIER SHALL CONFORM TO ND 1002136.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) CONTACT (WRAPOST) AND INSULATOR RETENTION: AFTER ASSEMBLY (FULL INSERTION) OF ALL PARTS, THE CONTACTS AND INSULATORS SHALL WITHSTAND A MINIMUM PUSHOUT LOAD, IN EITHER DIRECTION, OF 7.5 POUNDS APPLIED UNIFORMLY AT THE RATE OF ONE POUND PER SECOND.
     - (3) MARKING: IN ACCORDANCE WITH NOTE 1.B.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) DIELECTRIC WITHSTANDING VOLTAGE: 500 VRMS AT 60 CPS OR 600 VDC WHEN TESTED PER MIL-STD-202, METHOD 301.
     - (2) INSULATION RESISTANCE (PLATE TO EACH INSULATED PIN): 100,000 MEGOHMS MINIMUM WHEN TESTED PER MIL-STD-202, METHOD 302, CONDITION B.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:
     - (1) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENT OF 2.A.(2), AND THE DESIGN MATERIAL AND FINISH REQUIREMENTS.
     - (2) CERTIFICATE OF COMPLIANCE WITH ND 1002136.

3. DESIGN:
   - A. MATERIAL (MOUNTING PLATE): 6061 T-6 ALUMINUM PER QQ-A-250/11.
   - B. FINISH (MOUNTING PLATE): ELECTRICALLY CONDUCTIVE FILM PER MIL-C-5541.
   - C. SURFACE QUALITY: 125√ UNLESS OTHERWISE NOTED. REMOVE BURRS AND SHARP EDGES, EXCEPT AS NOTED.
   - D. MECHANICAL:
     - (1) INSULATOR, WRAPOST MALE MINIATURE, NASA PART 1006775.
     - (2) CONTACT WRAPOST MALE MINIATURE, NASA PART 1006782-3.


1006782-3
1006775
PARTIAL SECTION A-A
144 HOLES ⊕ .006 DIA
SEE NOTE 2.A.(2)
.06 R
6 PLACES
R
.253 .262 TYP 4 PLACES
.134 .124
A A
2.000 2.010 2 PLACES
8 SPACES AT .125 BSC=1.000 BSC
.281 BSC
.344 BSC
15 SPACES AT .125 BSC 1.875 BSC
.370 .380 2 PLACES
2.870 2.880
— .005
32
.377 .375
.160 .150
.258 .254
.085 .075
CSK & TAP FOR NO.6 (.138)-32 UNC-2B HELICAL INSERT PER MS33646
2 B HOLES
MS 21208C0620
2.605 2.595
1.961 1.951
.639 .649
.120 .130
1.620 1.630
.132 .142
.140 .146 DIA
4 A HOLES
.208 .198 DIA
4 C HOLES
⊕ .008 DIA
.12 HIGH
SEE NOTE 1.B
106
916
101
911
1.160 1.170
1.562 BSC
.781 BSC
2.477 2.487
2.495 2.505
3.130 3.120
.075 .085
.075 .085
.183 .193
.151 .161
2.035 2.045
2.563 BSC
.151 .161
.03 R MAX TYP
.212 .216 DIA & CSK 100° X .225 .235 DIA (FARSIDE)
2 D HOLES
⊕ .006 DIA
.12 ±.06
.50 ±.06
1006417 REV
.12 HIGH
SEE NOTE 1.B

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±2°

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN G. J. Doty DATE 29 JUL 65
CHECKED R Hoffer 7 AUG 65
APPROVAL 8-16-65
APPROVAL D. D'Amore 9/16/65
APPROVAL 9/14/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL 9/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HEADER, CONNECTOR, ELECTRICAL 144 PIN

SPECIFICATION CONTROL DRAWING

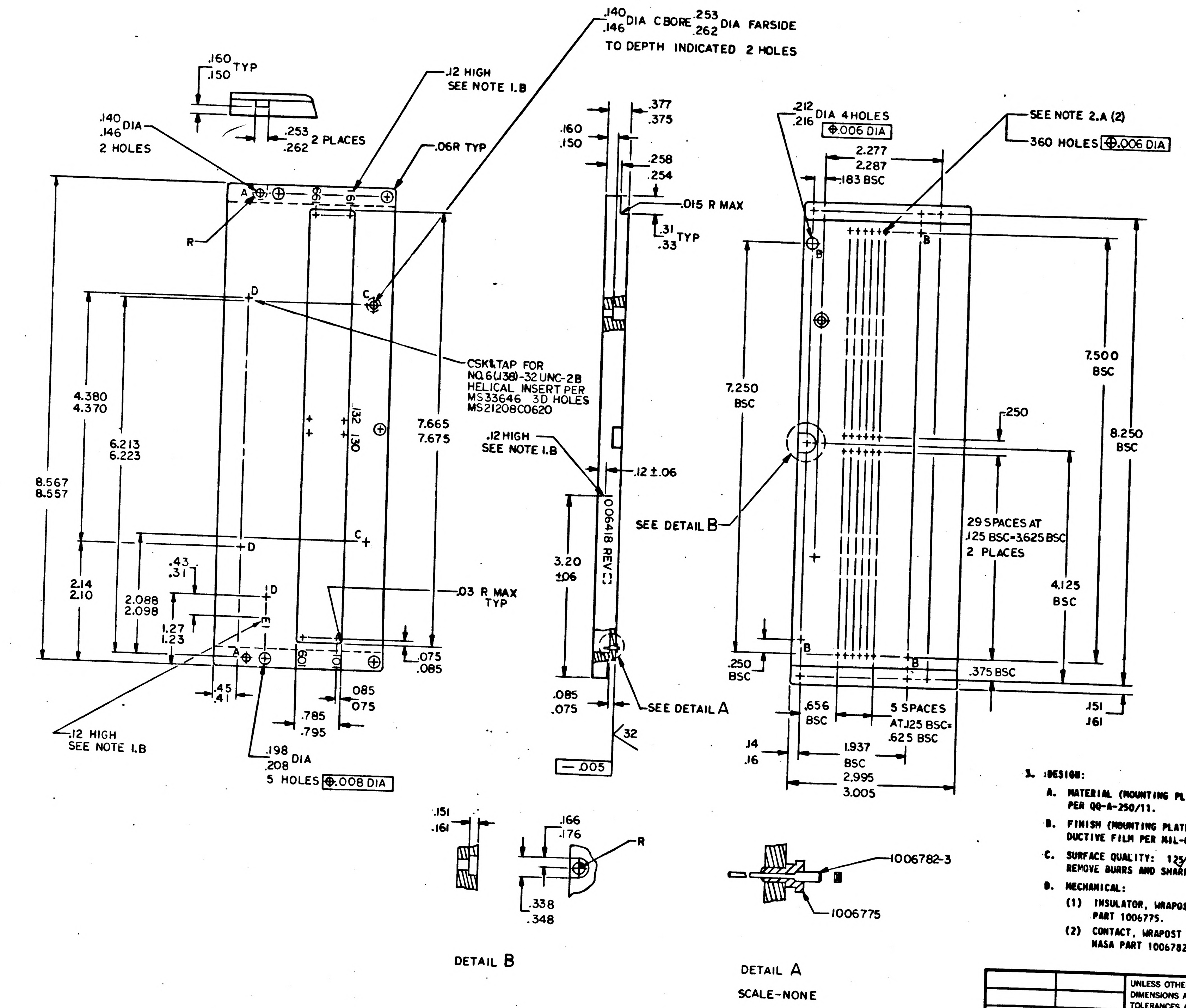
CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	D	1006417
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006417 1

1006418 | -

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25204	7/23/65	
1	REVISED PER CCA R25260 DR a.g. Biron CHK C. DeGreenia APPD	9/25/65	
-	RELEASED CLASS A PER TDRR 24524		



.140 .146 DIA CBORE .253 .262 DIA FARSIDE TO DEPTH INDICATED 2 HOLES
.160 .150 TYP
.253 .262 2 PLACES
.140 .146 DIA 2 HOLES
.12 HIGH SEE NOTE 1.B
.06R TYP
R
A
D
C
CSK&TAP FOR NO.6(.138)-32 UNC-2B HELICAL INSERT PER MS33646 3D HOLES MS21208C0620
4.380 4.370
6.213 6.223
8.567 8.557
7.665 7.675
.132 .130
.199 .191
2.14 2.10
2.088 2.098
1.27 1.23
.43 .31
E
.03 R MAX TYP
.075 .085
.45 .41
.785 .795
.085 .075
.12 HIGH SEE NOTE 1.B
.198 .208 DIA 5 HOLES ⊕ .008 DIA
.377 .375
.160 .150
.258 .254
.015 R MAX
.31 .33 TYP
.12 HIGH SEE NOTE 1.B
.12 ±.06
1006418 REV [ ]
3.20 ±.06
.085 .075
SEE DETAIL A
32
— .005
.212 .216 DIA 4 HOLES ⊕ .006 DIA
SEE NOTE 2.A (2)
360 HOLES ⊕ .006 DIA
2.277 2.287
.183 BSC
B
7.250 BSC
7.500 BSC
8.250 BSC
.250
SEE DETAIL B
29 SPACES AT .125 BSC=3.625 BSC 2 PLACES
4.125 BSC
.250 BSC
.375 BSC
.656 BSC
5 SPACES AT .125 BSC= .625 BSC
.151 .161
.14 .16
1.937 BSC
2.995 3.005
.151 .161
.166 .176
R
.338 .348
DETAIL B
1006782-3
1006775
DETAIL A
SCALE-NONE

REQUIREMENTS:

1. GENERAL:
   - A. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER , AND CONTACT IDENTIFICATION AS SHOWN.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
   - D. SUPPLIER SHALL CONFORM TO ND 1002136.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) CONTACT (WRAPOST) AND INSULATOR RETENTION: AFTER ASSEMBLY (FULL INSERTION) OF ALL PARTS, THE CONTACTS AND INSULATORS SHALL WITHSTAND A MINIMUM PUSHOUT LOAD, IN EITHER DIRECTION, OF 7.5 POUNDS APPLIED UNIFORMLY AT THE RATE OF ONE POUND PER SECOND.
     - (3) MARKING: IN ACCORDANCE WITH NOTE 1.B.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) DIELECTRIC WITHSTANDING VOLTAGE: 500 VRMS AT 60 CPS OR 600 VDC WHEN TESTED PER MIL-STD-202, METHOD 301.
     - (2) INSULATION RESISTANCE (PLATE TO EACH INSULATED PIN): 100,000 MEGOHMS MINIMUM WHEN TESTED PER MIL-STD-202, METHOD 302, CONDITION B.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:
     - (1) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF 2.A.(2), 3.A. AND 3.B.
     - (2) CERTIFICATE OF COMPLIANCE WITH ND 1002136.

3. DESIGN:
   - A. MATERIAL (MOUNTING PLATE): 6061 T-6 ALUMINUM PER QQ-A-250/11.
   - B. FINISH (MOUNTING PLATE): ELECTRICALLY CONDUCTIVE FILM PER MIL-C-5541.
   - C. SURFACE QUALITY: 125√ UNLESS OTHERWISE NOTED. REMOVE BURRS AND SHARP EDGES, EXCEPT AS NOTED.
   - D. MECHANICAL:
     - (1) INSULATOR, WRAPOST MALE MINIATURE, NASA PART 1006775.
     - (2) CONTACT, WRAPOST MALE MINIATURE, NASA PART 1006782-3.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±.016
DECIMALS .xxx ±.005
ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN B Katsulis DATE 30 Jul 65
CHECKED R. Martin 13 Aug 65
APPROVAL V P Cochran 9-16-65
APPROVAL D. O'Bryant 9/16/65
APPROVAL 9/16/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HEADER, CONNECTOR, ELECTRICAL,
360 PIN
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006418
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006421 A

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST.

(2) PARAGRAPH 3.2.1.8.1 SAND. SIZE-LESS THAN .008 INCH.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105.

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN .25 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN .19 HIGH CHARACTERS.

) EACH CONTAINER SHALL HAVE IDENTIFICATION PLATE 1004260-211 IN THE LOCATION INDICATED HEREON. SERIALIZATION PER ND 1002023.

(5) THE TOP & BOTTOM CUSHIONS IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY ADJACENT TO EACH TIE DOWN AND LIFT RING "SLING LIFT HERE".

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002275, CLASS I, CODE 6.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002275.

2. ACCEPTANCE AND INSPECTION: 100 PERCENT

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND AIR FILTER LOCATED BEHIND PRESSURE RELIEF VALVE.

D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT FOR TOP & BOTTOM PADS AND 4.0 POUNDS PER CUBIC FOOT FOR SIDES & ENDS.

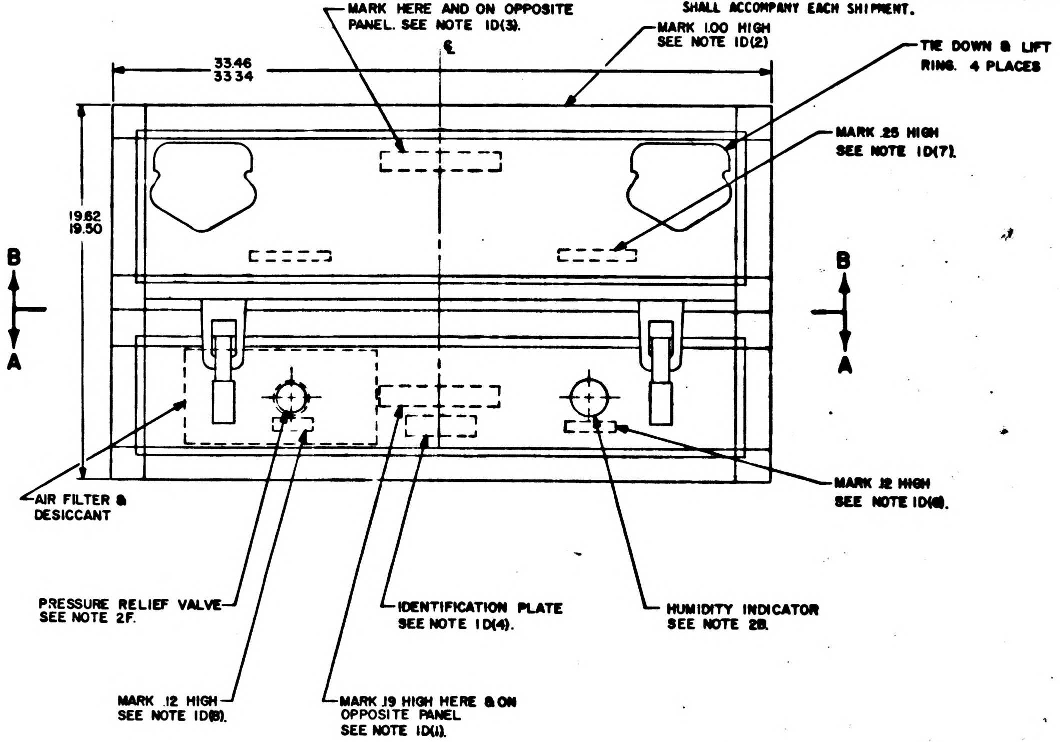
F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.

3. DESIGN:

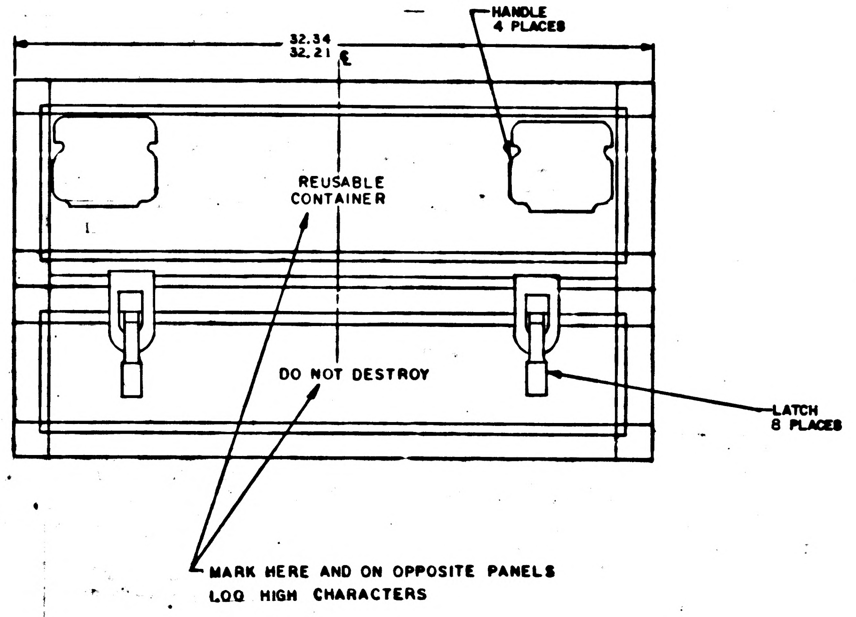
A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.

~~B. ALL DIMENSIONS ARE GIVEN IN TERMS OF INSIDE MEASUREMENT FROM PANEL TO PANEL.~~

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER ECA R25497		
-	CLASS A RELEASE PER TDRR 24481		
A	REVISED PER TDRR 25034 DR R. Gussetto CHK APPD A. Maynard	1/14/66	



MARK HERE AND ON OPPOSITE PANEL. SEE NOTE 1D(3).
MARK 1.00 HIGH SEE NOTE 1D(2)
TIE DOWN & LIFT RING. 4 PLACES
MARK .25 HIGH SEE NOTE 1D(7).
33.46
33.34
19.62
19.50
B
A
B
A
MARK .12 HIGH SEE NOTE 1D(6).
AIR FILTER & DESICCANT
PRESSURE RELIEF VALVE SEE NOTE 2F.
IDENTIFICATION PLATE SEE NOTE 1D(4).
HUMIDITY INDICATOR SEE NOTE 2B.
MARK .12 HIGH SEE NOTE 1D(8).
MARK .19 HIGH HERE & ON OPPOSITE PANEL SEE NOTE 1D(1).



HANDLE 4 PLACES
32.34
32.21
REUSABLE CONTAINER
DO NOT DESTROY
LATCH 8 PLACES
MARK HERE AND ON OPPOSITE PANELS 1.00 HIGH CHARACTERS

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN R. Betz DATE 21 Jul 65
CHECKED 4 AUG 65
APPROVAL 29 Oct 65
APPROVAL D. O. 10/30/65
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL 65
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

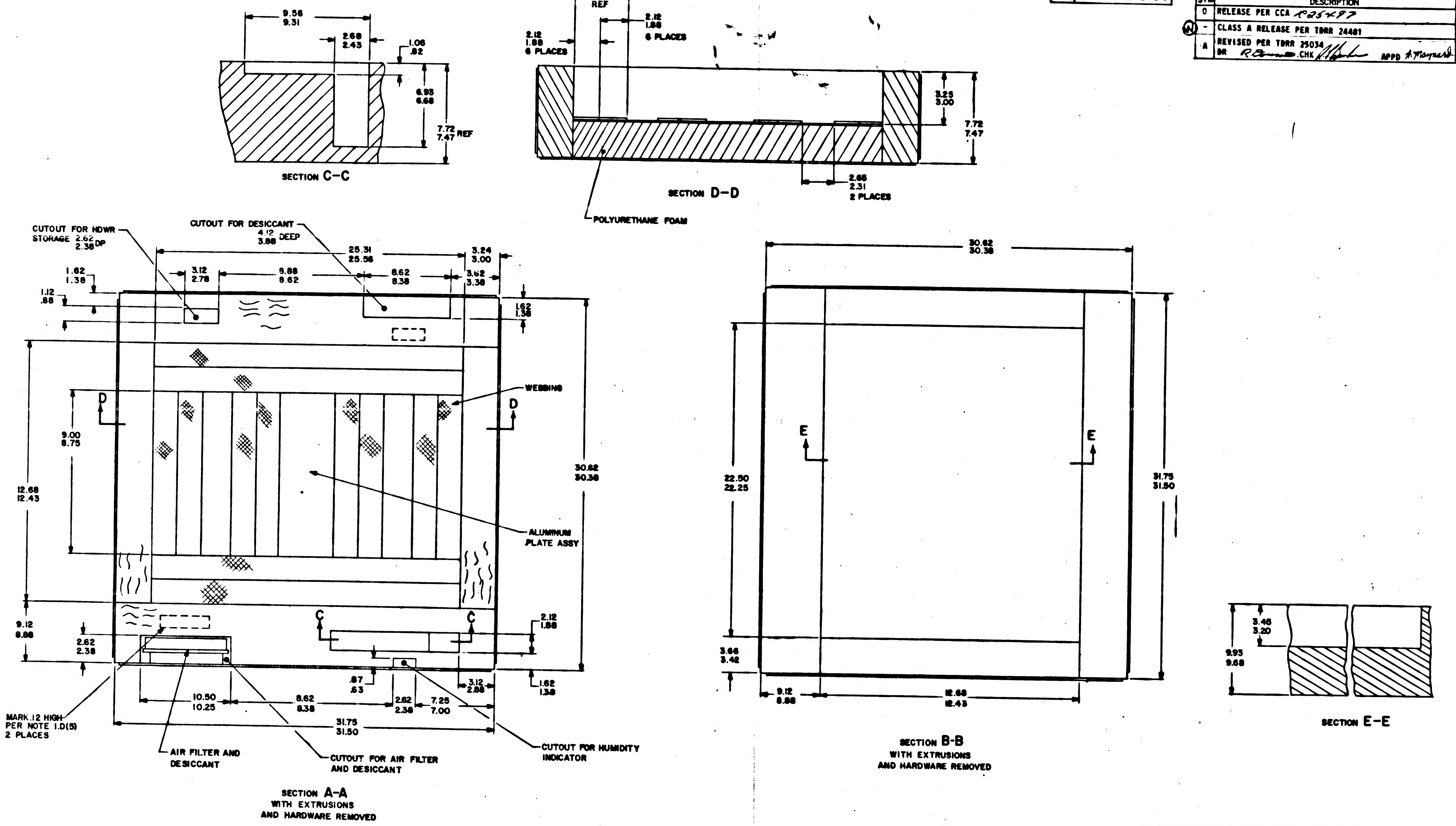
CONTAINER, SHIPPING AND STORAGE
APOLLO GUIDANCE COMPUTER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006421
SCALE NONE
WT
SHEET 1 OF 2

1006421 A

1006421 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25497		
-	CLASS A RELEASE PER TDRR 24481		
A	REVISED PER TDRR 25034 DR R. Ommen CHK APPD A. Maynard	1/12/66	



9.56
9.31
2.68
2.43
1.06
.82
6.93
6.68
7.72
7.47 REF
4.00
REF
2.12
1.88
6 PLACES
2.12
1.88
6 PLACES
3.25
3.00
7.72
7.47
2.66
2.31
2 PLACES
POLYURETHANE FOAM
CUTOUT FOR HDWR STORAGE 2.62 / 2.38 DP
CUTOUT FOR DESICCANT 4.12 / 3.88 DEEP
25.31
25.56
3.24
3.00
1.62
1.38
3.12
2.78
8.88
8.62
8.62
8.38
3.62
3.38
1.12
.88
1.62
1.38
WEBBING
D
D
9.00
8.75
12.68
12.43
30.62
30.38
ALUMINUM PLATE ASSY
9.12
8.88
2.62
2.38
C
C
2.12
1.88
.87
.63
3.12
2.88
1.62
1.38
10.50
10.25
8.62
8.38
2.62
2.38
7.25
7.00
31.75
31.50
MARK .12 HIGH PER NOTE 1.D(5) 2 PLACES
AIR FILTER AND DESICCANT
CUTOUT FOR AIR FILTER AND DESICCANT
CUTOUT FOR HUMIDITY INDICATOR
30.62
30.38
E
E
22.50
22.25
31.75
31.50
3.66
3.42
9.12
8.88
12.68
12.43
3.46
3.20
9.93
9.68

SECTION C-C

SECTION D-D

SECTION A-A
WITH EXTRUSIONS
AND HARDWARE REMOVED

SECTION B-B
WITH EXTRUSIONS
AND HARDWARE REMOVED

SECTION E-E

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL A. G. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE-
APOLLO GUIDANCE COMPUTER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	D	1006421
SCALE NONE	WT	SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006421 B

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25497		
-	CLASS A RELEASE PER TDRR 24401		
A	REVISED PER TDRR 25034 DR R. [illegible] CHK [illegible] APPD A. Maynard	1/14/66	[illegible]
B	REVISED PER TDRR 25693 DR J.P. Leonard CHK C. DeGreenia APPD [illegible]	3/7/66	[illegible]

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST.

(2) PARAGRAPH 3.2.1.8.1 SAND. SIZE-LESS THAN .008 INCH.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105.

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN .25 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN .19 HIGH CHARACTERS.

(4) EACH CONTAINER SHALL HAVE IDENTIFICATION PLATE 1004260-209 IN THE LOCATION INDICATED HEREON. SERIALIZATION PER ND 1002023.

(5) THE TOP & BOTTOM CUSHIONS IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY ADJACENT TO EACH TIE DOWN AND LIFT RING "SLING LIFT HERE".

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: 100 PERCENT

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND AIR FILTER LOCATED BEHIND PRESSURE RELIEF VALVE.

D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

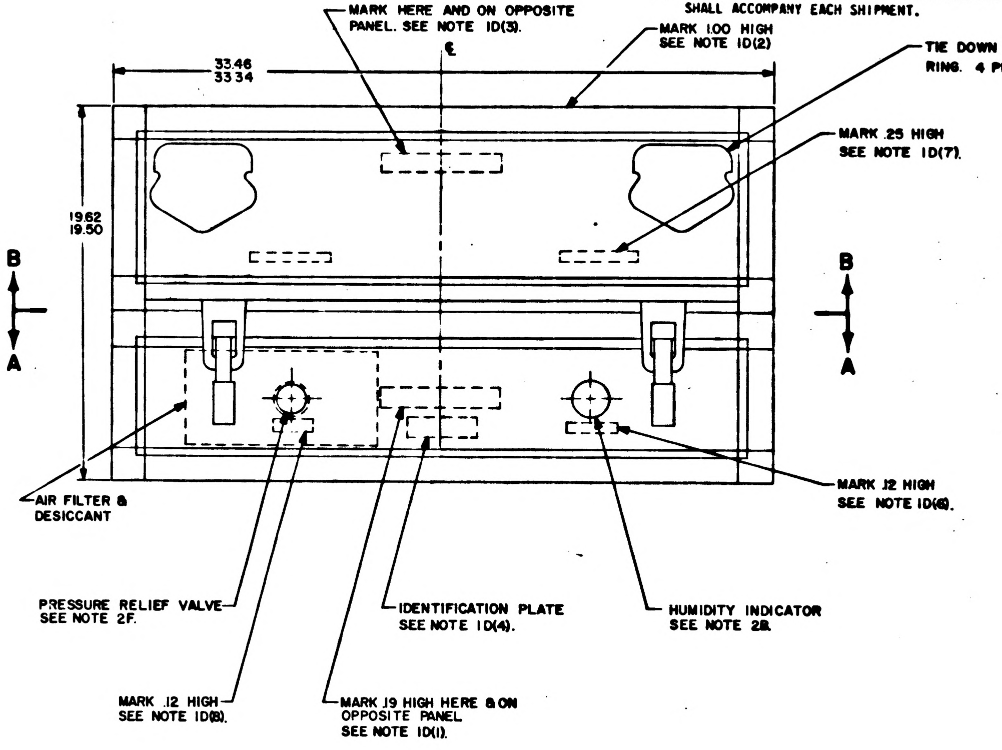
E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT FOR TOP & BOTTOM PADS AND 4.0 POUNDS PER CUBIC FOOT FOR SIDES & ENDS.

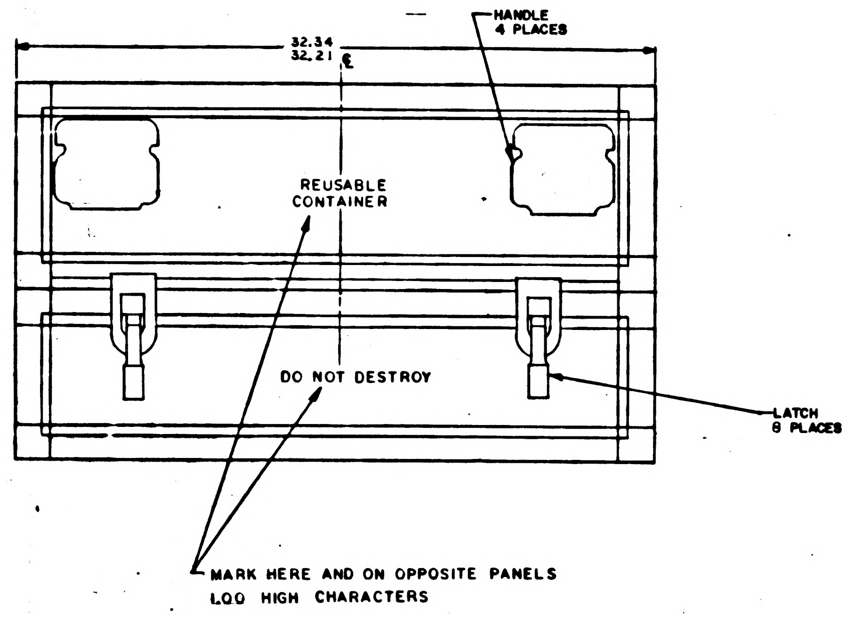
F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.

3. DESIGN:

A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.

~~B. ALL DIMENSIONS ARE GIVEN IN TERMS OF INSIDE MEASUREMENT FROM PANEL TO PANEL.~~


MARK HERE AND ON OPPOSITE PANEL. SEE NOTE ID(3).
MARK 1.00 HIGH SEE NOTE ID(2)
TIE DOWN & LIFT RING. 4 PLACES
33.46
33.34
℄
MARK .25 HIGH SEE NOTE ID(7).
19.62
19.50
B
A
B
A
MARK .12 HIGH SEE NOTE ID(6).
AIR FILTER & DESICCANT
PRESSURE RELIEF VALVE SEE NOTE 2F.
IDENTIFICATION PLATE SEE NOTE ID(4).
HUMIDITY INDICATOR SEE NOTE 2B.
MARK .12 HIGH SEE NOTE ID(8).
MARK .19 HIGH HERE & ON OPPOSITE PANEL SEE NOTE ID(1).


HANDLE 4 PLACES
32.34
32.21
℄
REUSABLE CONTAINER
DO NOT DESTROY
LATCH 8 PLACES
MARK HERE AND ON OPPOSITE PANELS
1.00 HIGH CHARACTERS

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN R. Doty DATE 11 Jul 65
CHECKED [illegible] 65
APPROVAL [illegible] 65
APPROVAL [illegible] 10/30/65
APPROVAL [illegible]
NASA APPROVAL A. C. METZGER
MIT APPROVAL [illegible]
MIT APPROVAL [illegible] 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE
APOLLO GUIDANCE COMPUTER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	D	1006421

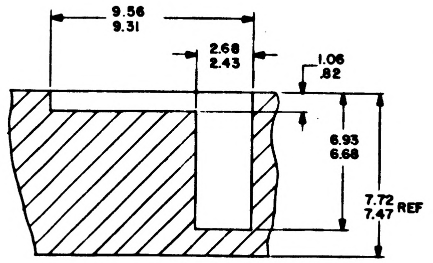
SCALE NONE WT SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006421 B

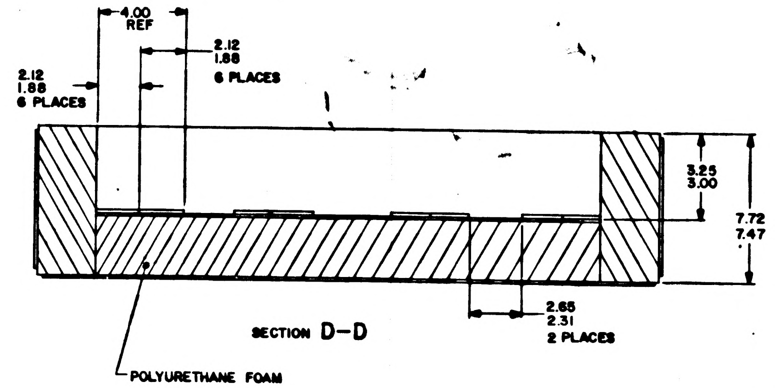
1006421 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25X97		
-	CLASS A RELEASE PER TDRR 24481		
A	REVISED PER TDRR 25034 DR R. [illegible] CHK [illegible] APPD A. Maynard	1/12/66	[illegible]
B	REVISED PER TDRR 25693 DR J. P. [illegible] CHK C. DeGreenia APPD S. Conley	2/2/66	[illegible]



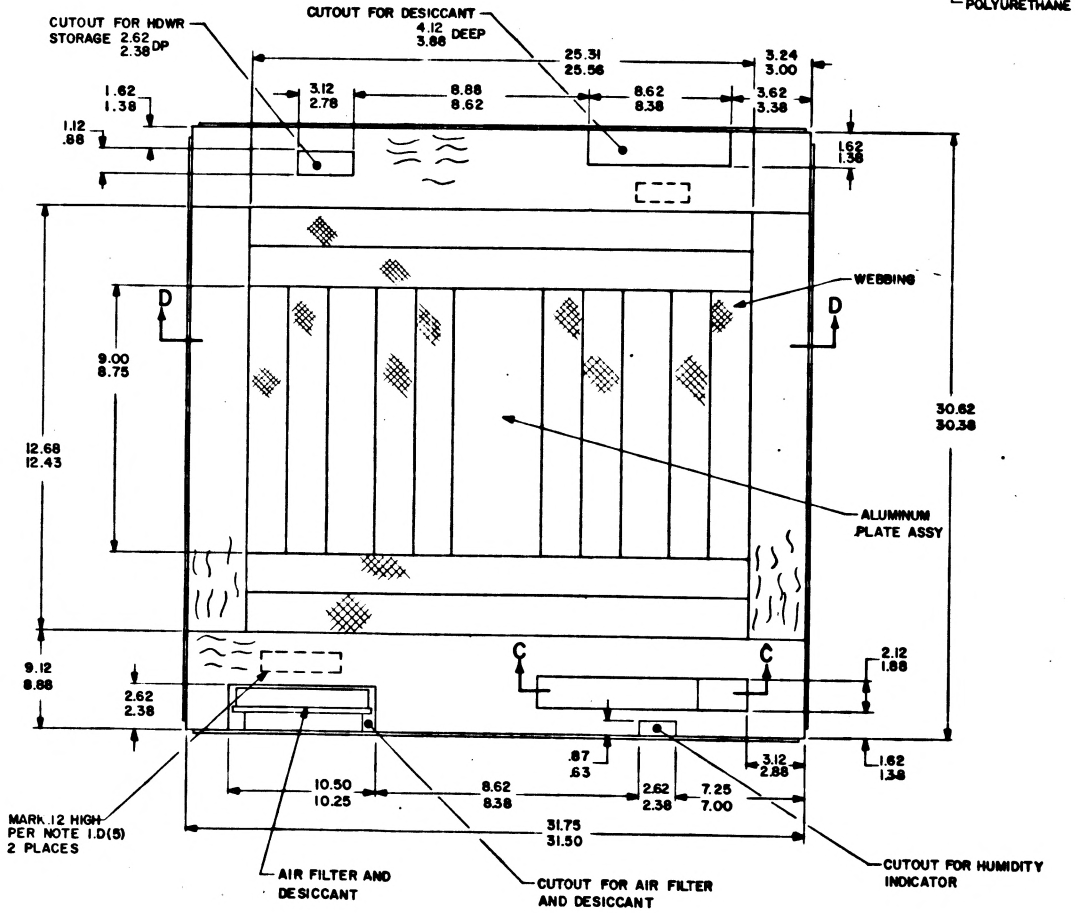
9.56
9.31
2.68
2.43
1.06
.82
6.93
6.68
7.72
7.47 REF

SECTION C-C



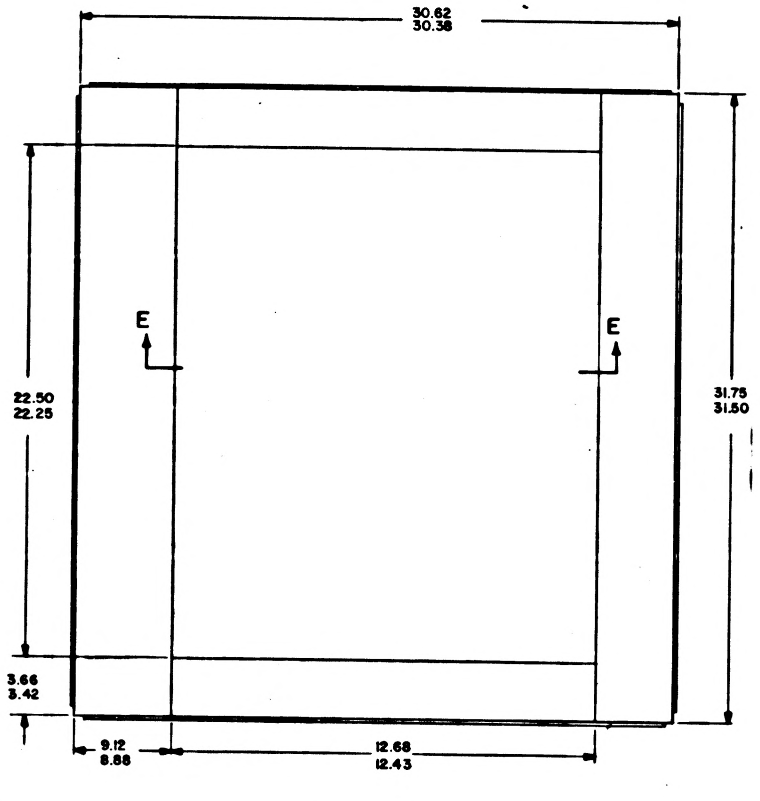
4.00
REF
2.12
1.88
6 PLACES
2.12
1.88
6 PLACES
3.25
3.00
7.72
7.47
2.65
2.31
2 PLACES
POLYURETHANE FOAM

SECTION D-D



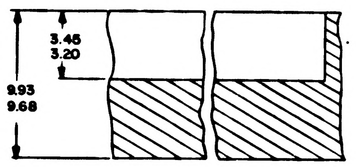
CUTOUT FOR HDWR STORAGE 2.62 2.38 DP
CUTOUT FOR DESICCANT 4.12 3.88 DEEP
25.31
25.56
3.24
3.00
1.62
1.38
3.12
2.78
8.88
8.62
8.62
8.38
3.62
3.38
1.12
.88
1.62
1.38
D
D
WEBBING
9.00
8.75
12.68
12.43
30.62
30.38
ALUMINUM PLATE ASSY
9.12
8.88
2.62
2.38
C
C
2.12
1.88
.87
.63
3.12
2.88
1.62
1.38
10.50
10.25
8.62
8.38
2.62
2.38
7.25
7.00
31.75
31.50
MARK .12 HIGH PER NOTE 1.D(5) 2 PLACES
AIR FILTER AND DESICCANT
CUTOUT FOR AIR FILTER AND DESICCANT
CUTOUT FOR HUMIDITY INDICATOR

SECTION A-A
WITH EXTRUSIONS
AND HARDWARE REMOVED



30.62
30.38
E
E
22.50
22.25
31.75
31.50
3.66
3.42
9.12
8.88
12.68
12.43

SECTION B-B
WITH EXTRUSIONS
AND HARDWARE REMOVED



3.45
3.20
9.93
9.68

SECTION E-E

1006421 B

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN [illegible] DATE 28 Oct 65
CHECKED [illegible]
APPROVAL [illegible] 29 Oct 65
APPROVAL D. O'[illegible]
APPROVAL [illegible]
NASA APPROVAL A. G. METZGER
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE-
APOLLO GUIDANCE COMPUTER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006421
SCALE NONE
WT
SHEET 2 OF 2

— 1006421

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25497		
—	CLASS A RELEASE PER TDRC 24481		

REVISIONS

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

(1) PARAGRAPH 3.2.1.8.2 DUST.

(2) PARAGRAPH 3.2.1.8.1 SAND. SIZE-LESS THAN .008 INCH.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105.

(1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

(2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

(3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN .25 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN .19 HIGH CHARACTERS.

(4) EACH CONTAINER SHALL HAVE AN IDENTIFICATION PLATE IN ACCORDANCE WITH NASA DRAWING 1020086 IN THE LOCATION INDICATED HEREON. THE NAME SHALL BE "CONTAINER, APOLLO GUIDANCE COMPUTER" AND THE PART NO. SHALL BE THE SAME AS THE DRAWING NO. SERIALIZATION PER ND 1002023.

(5) THE TOP & BOTTOM CUSHIONS IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

(6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

(7) MARK DIRECTLY ADJACENT TO EACH TIE DOWN AND LIFT RING "SLING LIFT HERE".

(8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".

E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

(1) ~~MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.~~

2. ACCEPTANCE AND INSPECTION: 100 PERCENT

A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND AIR FILTER LOCATED BEHIND PRESSURE RELIEF VALVE.

D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

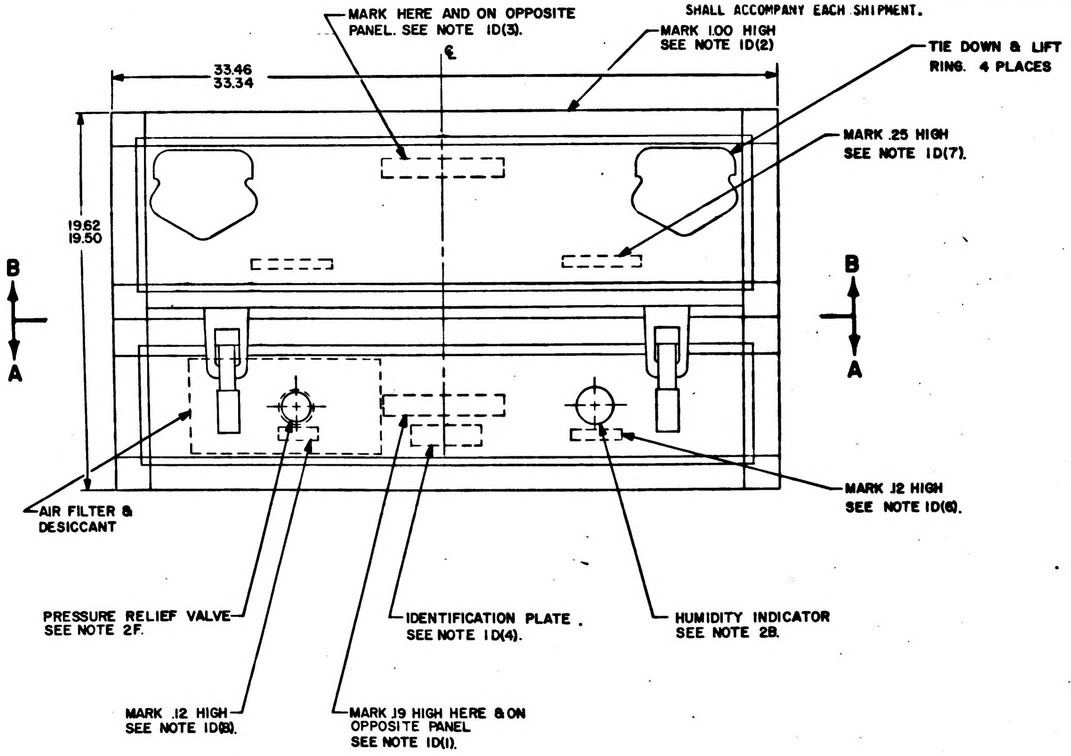
E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT FOR TOP & BOTTOM PADS AND 4.0 POUNDS PER CUBIC FOOT FOR SIDES & ENDS.

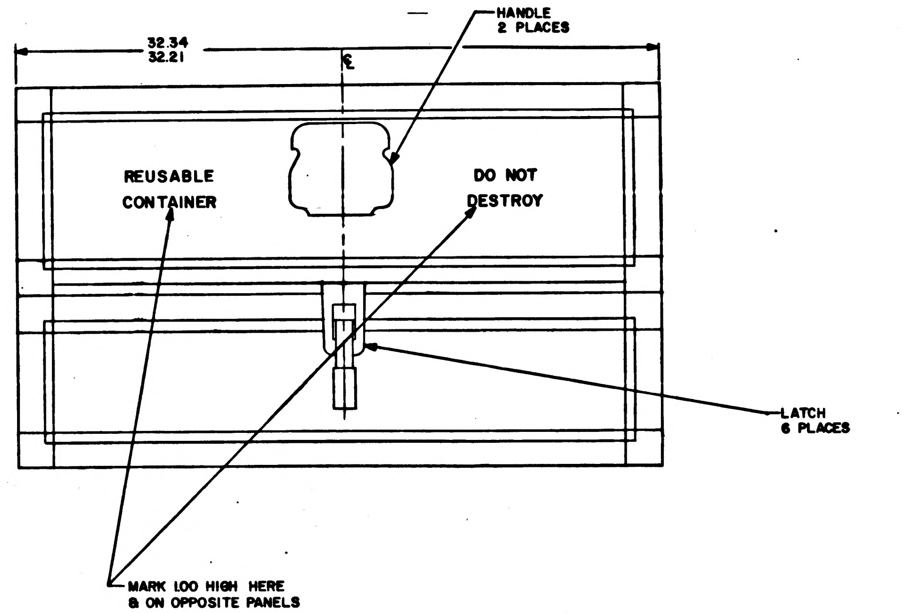
F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 1.0 PSI.

3. DESIGN:

A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.

B. ALL DIMENSIONS ARE GIVEN IN TERMS OF INSIDE MEASUREMENT FROM PANEL TO PANEL.


MARK HERE AND ON OPPOSITE PANEL. SEE NOTE ID(3).
MARK 1.00 HIGH SEE NOTE ID(2)
TIE DOWN & LIFT RING. 4 PLACES
33.46
33.34
MARK .25 HIGH SEE NOTE ID(7).
19.62
19.50
B
A
B
A
MARK .12 HIGH SEE NOTE ID(6).
AIR FILTER & DESICCANT
PRESSURE RELIEF VALVE SEE NOTE 2F.
IDENTIFICATION PLATE SEE NOTE ID(4).
HUMIDITY INDICATOR SEE NOTE 2B.
MARK .12 HIGH SEE NOTE ID(8).
MARK .19 HIGH HERE & ON OPPOSITE PANEL SEE NOTE ID(1).


HANDLE 2 PLACES
32.34
32.21
REUSABLE CONTAINER
DO NOT DESTROY
LATCH 6 PLACES
MARK 1.00 HIGH HERE & ON OPPOSITE PANELS

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN R. Betz DMS DATE 21 Jul 65
CHECKED A. Kasha 4 AUG 65
APPROVAL 29 Oct 65
APPROVAL D. O'Bryant 10/30/65
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7 Dec 65
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE
APOLLO GUIDANCE COMPUTER
SPECIFICATION CONTROL DRAWING

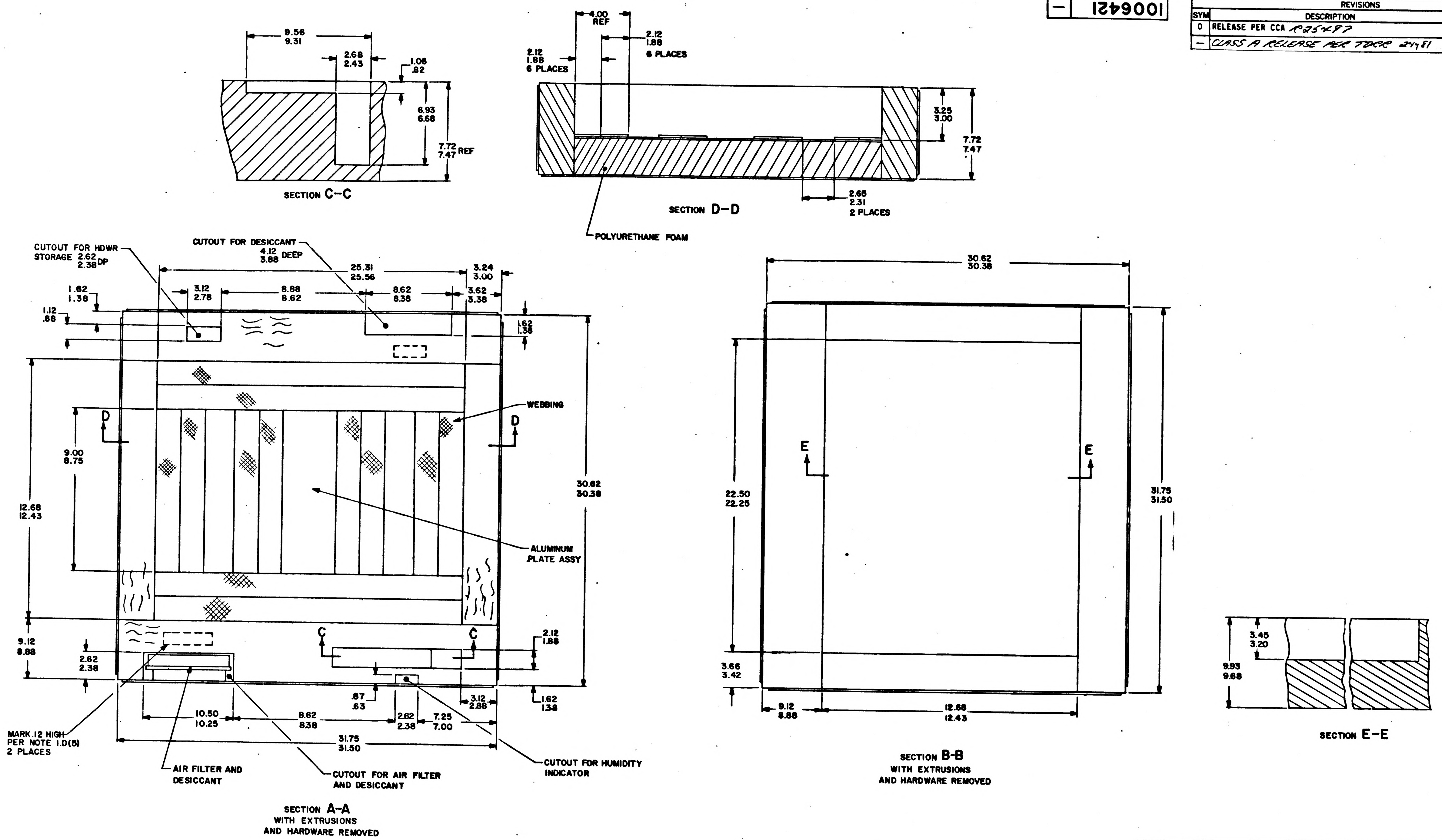
CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006421
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006421

–	1006421

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25497		
–	CLASS A RELEASE PER TDRR 24481		



9.56
9.31
2.68
2.43
1.06
.82
6.93
6.68
7.72
7.47 REF
SECTION C–C
4.00
REF
2.12
1.88
6 PLACES
2.12
1.88
6 PLACES
3.25
3.00
7.72
7.47
2.65
2.31
2 PLACES
SECTION D–D
POLYURETHANE FOAM
CUTOUT FOR HDWR STORAGE 2.62 2.38 DP
CUTOUT FOR DESICCANT 4.12 3.88 DEEP
25.31
25.56
3.24
3.00
1.62
1.38
3.12
2.78
8.88
8.62
8.62
8.38
3.62
3.38
1.12
.88
1.62
1.38
WEBBING
D
D
9.00
8.75
12.68
12.43
30.62
30.38
ALUMINUM PLATE ASSY
9.12
8.88
2.62
2.38
C
C
2.12
1.88
.87
.63
3.12
2.88
1.62
1.38
10.50
10.25
8.62
8.38
2.62
2.38
7.25
7.00
31.75
31.50
MARK .12 HIGH PER NOTE 1.D(5) 2 PLACES
AIR FILTER AND DESICCANT
CUTOUT FOR AIR FILTER AND DESICCANT
CUTOUT FOR HUMIDITY INDICATOR
SECTION A–A
WITH EXTRUSIONS AND HARDWARE REMOVED
30.62
30.38
E
E
22.50
22.25
31.75
31.50
3.66
3.42
9.12
8.88
12.68
12.43
SECTION B-B
WITH EXTRUSIONS AND HARDWARE REMOVED
3.45
3.20
9.93
9.68
SECTION E–E

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE 28 OCT 65
CHECKED 28 OCT 65
APPROVAL 29 Oct 65
APPROVAL
APPROVAL
NASA APPROVAL A. G. METZGER
MIT APPROVAL
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE–APOLLO GUIDANCE COMPUTER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	D	1006421
SCALE NONE	WT	SHEET 2 OF 2

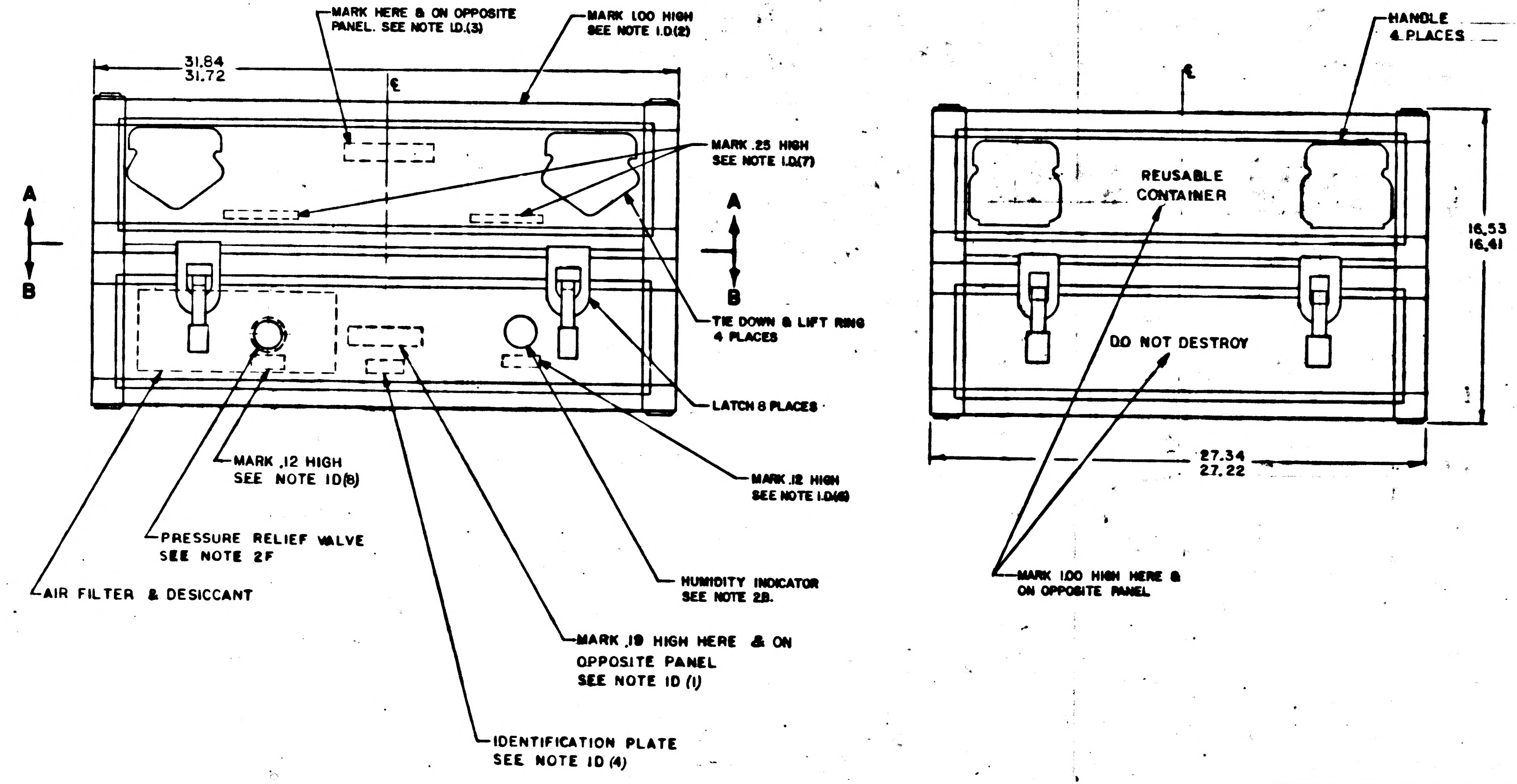
1006422	A

REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.
   - B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:
     - (1) PARAGRAPH 3.2.1.8.2 DUST
     - (2) PARAGRAPH 3.2.1.8.1 SAND, SIZE LESS THAN .008 INCH
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105.
     - (1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".
     - (2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".
     - (3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN .25 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN .19 HIGH CHARACTERS.
     - (4) EACH CONTAINER SHALL HAVE IDENTIFICATION PLATE 1004260-210 IN THE LOCATION INDICATED HEREON. SERIALIZATION PER ND 1002023.
     - (5) THE BOTTOM CUSHION IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.
     - (6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".
     - (7) MARK ADJACENT TO EACH TIE DOWN AND LIFT RING "SLING LIFT HERE".
     - (8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION: TWO PERCENT
   - A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.
   - B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.
   - C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND AIR FILTER LOCATED BEHIND PRESSURE RELIEF VALVE.
   - D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.
   - E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT.
   - F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 0.5 PSI.
3. DESIGN:
   - A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.
   - ~~B. ALL DIMENSIONS ARE GIVEN IN TERMS OF INSIDE MEASUREMENT FROM PANEL TO PANEL.~~

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25313	10/4/65	A. Havens
1	CHANGED PER CCA R25457 DR R. Donato CHK C. DeGrenia APPD 10-11-65	10 NOV 65	S.F.L.
—	CLASS A RELEASED PER TDRR 24524		
A	CHANGED PER TDRR 25035 DR R. Donato CHK P. Beck APPD H. Hayward	1/12/66	J.M.



MARK HERE & ON OPPOSITE PANEL. SEE NOTE I.D.(3)
MARK 1.00 HIGH SEE NOTE I.D.(2)
31.84
31.72
℄
MARK .25 HIGH SEE NOTE I.D.(7)
A
B
A
B
TIE DOWN & LIFT RING 4 PLACES
LATCH 8 PLACES
MARK .12 HIGH SEE NOTE ID(8)
MARK .12 HIGH SEE NOTE I.D.(6)
PRESSURE RELIEF VALVE SEE NOTE 2F
AIR FILTER & DESICCANT
HUMIDITY INDICATOR SEE NOTE 2B.
MARK .19 HIGH HERE & ON OPPOSITE PANEL SEE NOTE ID (1)
IDENTIFICATION PLATE SEE NOTE ID (4)
HANDLE 4 PLACES
℄
REUSABLE CONTAINER
DO NOT DESTROY
16.53
16.41
27.34
27.22
MARK 1.00 HIGH HERE & ON OPPOSITE PANEL

ORIGINAL SOURCE OF SUPPLY:

ZERO MFG. CO.
BURBANK, CALIFORNIA
R5404 (MODIFIED)

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J. Ortega DATE 20 Jul 65
CHECKED 4 AUG 65
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL A. Q. METZGER
MIT APPROVAL
MIT APPROVAL 10/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

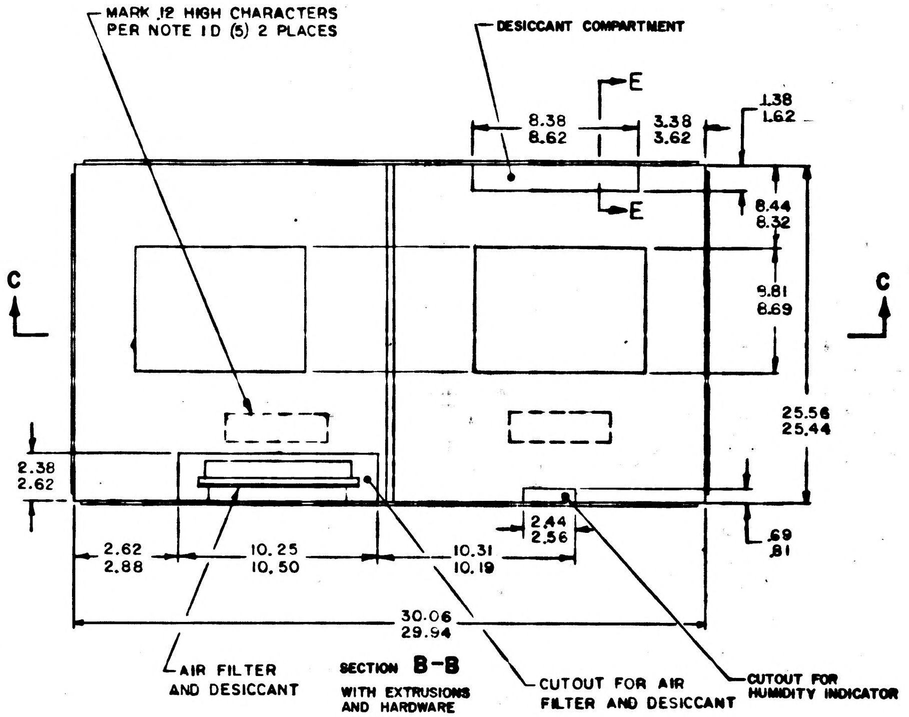
CONTAINER, SHIPPING AND STORAGE
APOLLO UNIVERSAL DSKY
SOURCE CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006422
SCALE NONE
WT
SHEET 1 OF 2

1006422	A

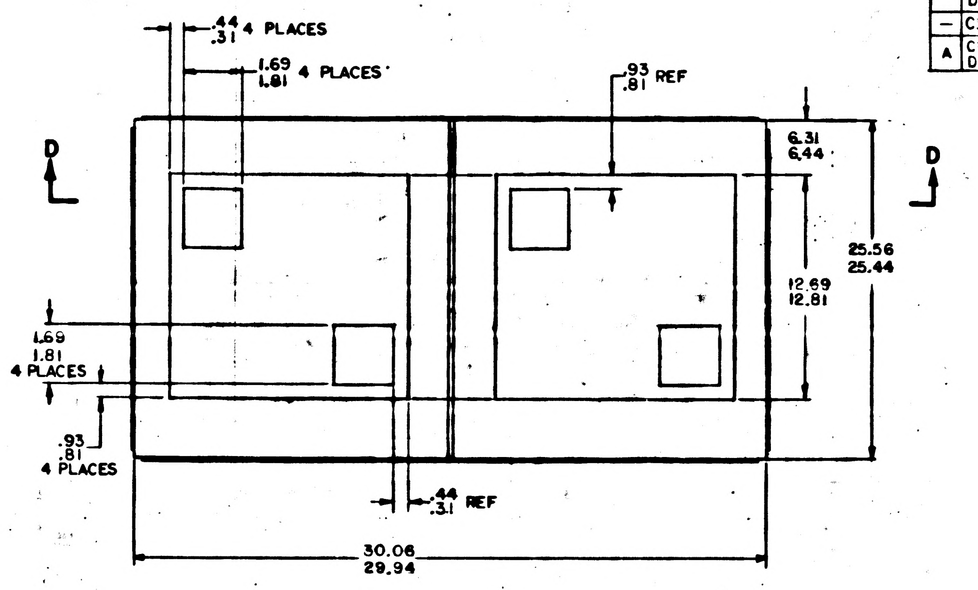
1006422 A

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25313	10/14/65	A. Haran
1	CHANGED PER CCA R25457 DR CHK C. DeGreenia APPD	11 NOV 65	
—	CLASS A RELEASED PER TDRR 24524		
A	CHANGED PER TDRR 25035 DR CHK APPD A Maynard	1/14/66	



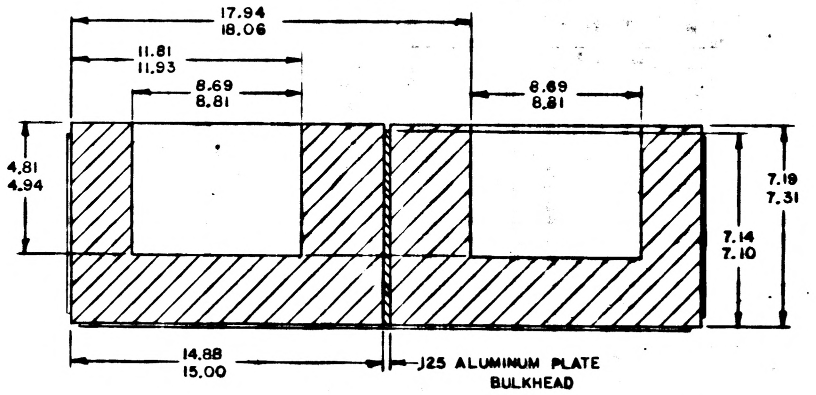
MARK .12 HIGH CHARACTERS PER NOTE 1D (5) 2 PLACES
DESICCANT COMPARTMENT
E
E
C
C
8.38
8.62
3.38
3.62
1.38
1.62
8.44
8.32
9.81
8.69
25.56
25.44
2.38
2.62
2.44
2.56
.69
.81
2.62
2.88
10.25
10.50
10.31
10.19
30.06
29.94
AIR FILTER AND DESICCANT
CUTOUT FOR AIR FILTER AND DESICCANT
CUTOUT FOR HUMIDITY INDICATOR

SECTION B-B
WITH EXTRUSIONS AND HARDWARE REMOVED



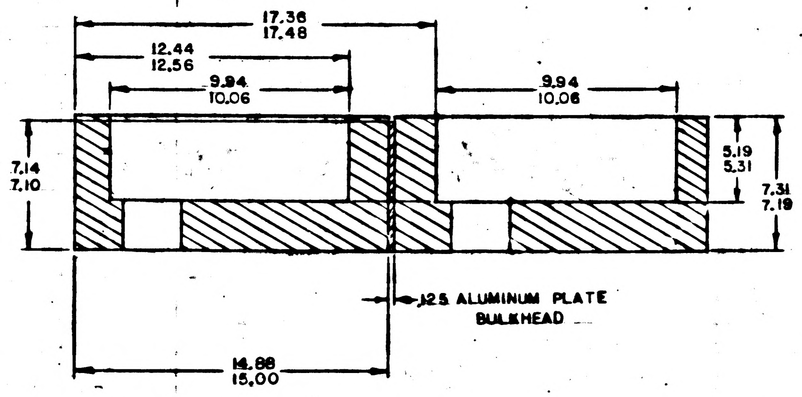
.44
.31
4 PLACES
1.69
1.81
4 PLACES
.93
.81
REF
D
D
6.31
6.44
25.56
25.44
12.69
12.81
1.69
1.81
4 PLACES
.93
.81
4 PLACES
.44
.31
REF
30.06
29.94

SECTION A-A
WITH EXTRUSIONS AND HARDWARE REMOVED



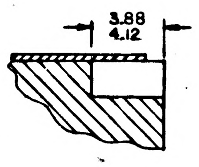
17.94
18.06
11.81
11.93
8.69
8.81
8.69
8.81
4.81
4.94
7.19
7.31
7.14
7.10
14.88
15.00
.125 ALUMINUM PLATE BULKHEAD

SECTION C-C



17.36
17.48
12.44
12.56
9.94
10.06
9.94
10.06
7.14
7.10
5.19
5.31
7.31
7.19
.125 ALUMINUM PLATE BULKHEAD
14.88
15.00

SECTION D-D



SECTION E-E

1006422 A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN A. Doty DATE 21 Jul 65
CHECKED 4 AUG 65
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL A.C. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE
APOLLO UNIVERSAL DSKY

SOURCE CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006422
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

–	1006422

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-22443 (WEP) TYPE I, CLASS 1, STYLE D WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN. SUBMITTAL OF A PREPRODUCTION SAMPLE SHALL NOT BE REQUIRED.

   B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

   C. UNITS SHALL BE DESIGNED TO MEET THE APOLLO ENVIRONMENTAL CRITERIA SPECIFICATION DATED MARCH 25, 1963 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, PARAGRAPHS 3.2.1 THROUGH 3.2.1.16 WITH THE FOLLOWING EXCEPTIONS:

      (1) PARAGRAPH 3.2.1.8.2 DUST

      (2) PARAGRAPH 3.2.1.8.1 SAND, SIZE LESS THAN .008 INCH

   D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED MARKING SHALL BE SILK-SCREENED USING RED COLOR IN ACCORDANCE WITH FEDERAL STANDARD 595 COLOR NUMBER 21105.

      (1) MARK IN LOCATION INDICATED ON DRAWING "DESICCATED - DO NOT OPEN UNTIL READY FOR USE OR INSPECTION".

      (2) MARK ON TOP PANEL OF COVER "CAUTION - DELICATE ELECTRONIC ASSEMBLY - THIS SIDE UP".

      (3) MARK IN LOCATION INDICATED ON DRAWING "CAUTION - SECURE ALL LATCHES BEFORE LIFTING". THE WORD CAUTION SHALL BE PRINTED IN .25 INCH HIGH CHARACTERS AND THE REMAINING WORDS SHALL BE PRINTED IN .19 HIGH CHARACTERS.

      (4) EACH CONTAINER SHALL HAVE IDENTIFICATION PLATE 1004260-210 IN THE LOCATION INDICATED HEREON. SERIALIZATION PER ND 1002023.

      (5) THE BOTTOM CUSHION IN THE CONTAINER SHALL BE PROVIDED WITH TWO PERMANENTLY ATTACHED METAL PLATES OR EQUIVALENT IN LOCATIONS INDICATED ON DRAWING SPECIFYING THE DESICCANT REQUIREMENT.

      (6) MARK IN LOCATION INDICATED ON DRAWING "INSPECT EQUIPMENT AND REPLACE DESICCANT IF INDICATOR IS PINK".

      (7) MARK ADJACENT TO EACH TIE DOWN AND LIFT RING "SLING LIFT HERE".

      (8) MARK IN LOCATION INDICATED ON DRAWING "TWO-WAY AUTOMATIC RELIEF VALVE. DEPRESS CORE BEFORE OPENING CONTAINER".

   E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215. CLASS I, CODE 6.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: 100 PERCENT

   A. A CERTIFICATE OF COMPLIANCE WITH ALL THE REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.

   B. UNITS SHALL BE PROVIDED WITH A HUMIDITY INDICATOR IN ACCORDANCE WITH MIL-I-26860.

   C. UNITS SHALL BE PROVIDED WITH A DESICCANT HOLDER AND AIR FILTER LOCATED BEHIND PRESSURE RELIEF VALVE.

   D. SECURITY SEAL: PROVISION SHALL BE MADE SO THAT LATCHES CAN BE SECURED WITH A MULTI-STRAND WIRE-LEAD SEAL.

   E. UNITS SHALL BE PROVIDED WITH POLYURETHANE FOAM CUSHIONS BONDED TO THE INTERIOR SURFACES IN THE CONFIGURATION INDICATED ON DRAWING. DENSITY OF POLYURETHANE FOAM SHALL BE 2-1/2 POUNDS PER CUBIC FOOT.

   F. UNITS SHALL BE PROVIDED WITH AN AUTOMATIC PRESSURE RELIEF VALVE TO RELIEVE PRESSURE DIFFERENTIALS IN EXCESS OF 1.0 PSI.

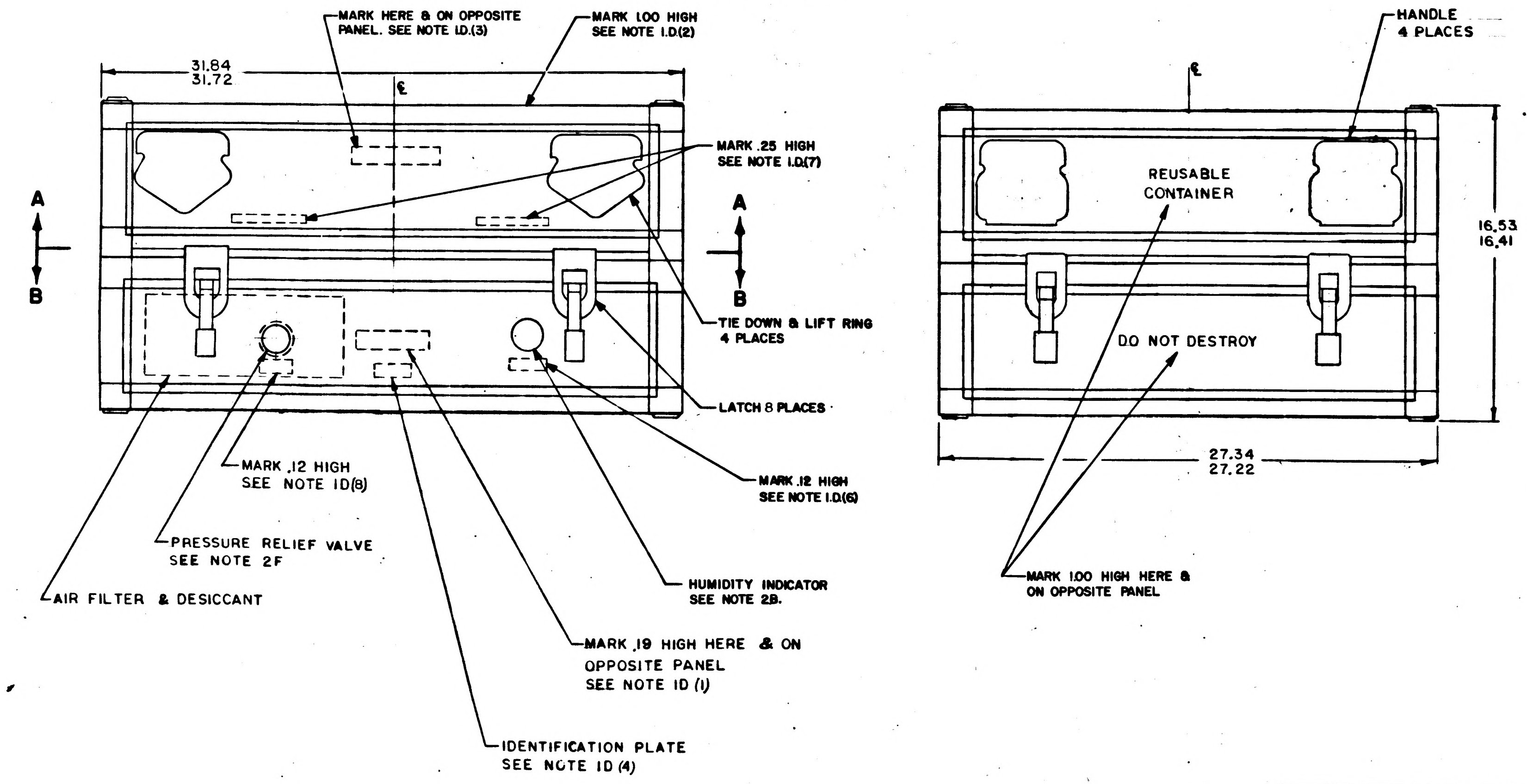
3. DESIGN:

   A. FINISH: FINISH SHALL BE IN ACCORDANCE WITH MIL-C-22443 EXCEPT ZINC CHROMATE PRIMER PER MIL-P-8585 SHALL BE FOLLOWED BY 2 COATS OF ENAMEL PER NASA DRAWING 1016194.

   B. ALL DIMENSIONS ARE GIVEN IN TERMS OF INSIDE MEASUREMENT FROM PANEL TO PANEL.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25313	[illegible]	[illegible]
1	CHANGED PER CCA R25457 DR [illegible] CHK C DeGreena APPD [illegible]	[illegible]	[illegible]
–	CLASS A RELEASED PER TDRR 24524		


MARK HERE & ON OPPOSITE PANEL. SEE NOTE I.D.(3)
MARK 1.00 HIGH SEE NOTE I.D.(2)
31.84
31.72
℄
MARK .25 HIGH SEE NOTE I.D.(7)
A
B
A
B
TIE DOWN & LIFT RING 4 PLACES
LATCH 8 PLACES
MARK .12 HIGH SEE NOTE I.D.(6)
MARK .12 HIGH SEE NOTE ID(8)
PRESSURE RELIEF VALVE SEE NOTE 2F
AIR FILTER & DESICCANT
HUMIDITY INDICATOR SEE NOTE 2B.
MARK .19 HIGH HERE & ON OPPOSITE PANEL SEE NOTE ID (1)
IDENTIFICATION PLATE SEE NOTE ID (4)
℄
HANDLE 4 PLACES
REUSABLE CONTAINER
DO NOT DESTROY
16.53
16.41
27.34
27.22
MARK 1.00 HIGH HERE & ON OPPOSITE PANEL

ORIGINAL SOURCE OF SUPPLY:

ZERO MFG. CO.
BURBANK, CALIFORNIA
R5404 (MODIFIED)

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J. Ortiz DATE 20 Jul 65
CHECKED [illegible] 4 AUG 65
APPROVAL [illegible]
APPROVAL [illegible] 1 Nov 65
APPROVAL [illegible]
NASA APPROVAL A. G. METZGER
MIT APPROVAL [illegible]
MIT APPROVAL [illegible] 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

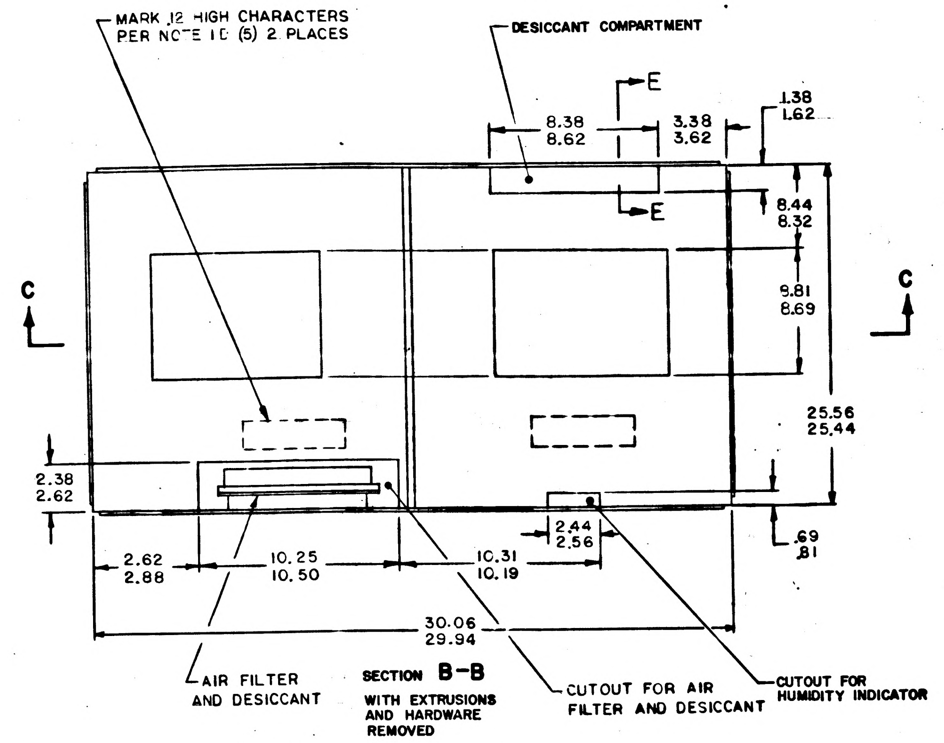
CONTAINER, SHIPPING AND STORAGE APOLLO UNIVERSAL DSKY

SOURCE CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	D	1006422
SCALE NONE	WT	SHEET 1 OF 2

1006422 –

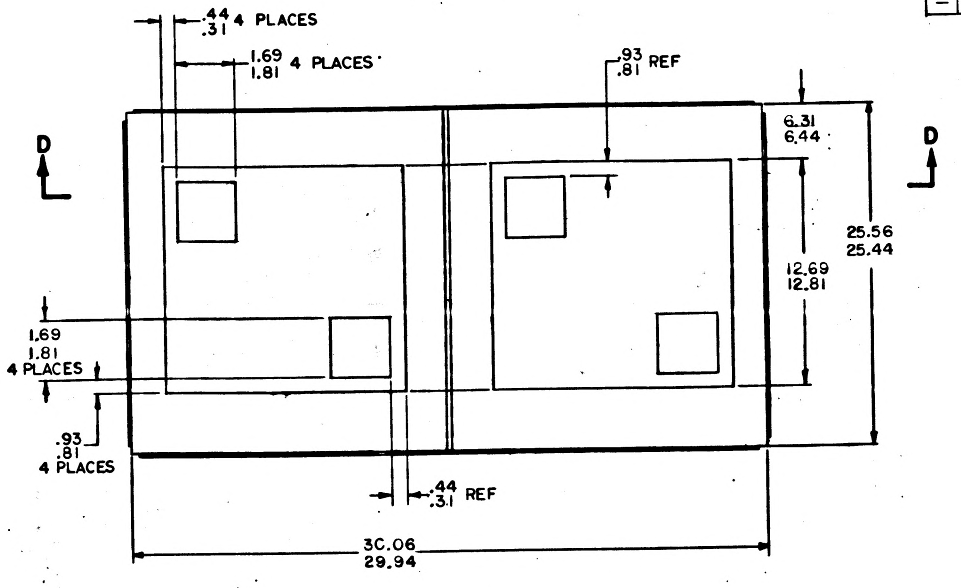
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25313	10/14/65	U. Marano
1	CHANGED PER CCA R25457 DR R. Gonnell CHK C. DeGreena APPD MS 11-20	11 NOV 65	S.J.S.
–	CLASS A RELEASED PER TDRR 24524		



MARK .12 HIGH CHARACTERS PER NOTE 10 (5) 2 PLACES
DESICCANT COMPARTMENT
E
E
C
C
8.38 8.62
3.38 3.62
1.38 1.62
8.44 8.32
9.81 8.69
25.56 25.44
2.38 2.62
2.44 2.56
.69 .81
2.62 2.88
10.25 10.50
10.31 10.19
30.06 29.94
AIR FILTER AND DESICCANT
CUTOUT FOR AIR FILTER AND DESICCANT
CUTOUT FOR HUMIDITY INDICATOR

SECTION B-B

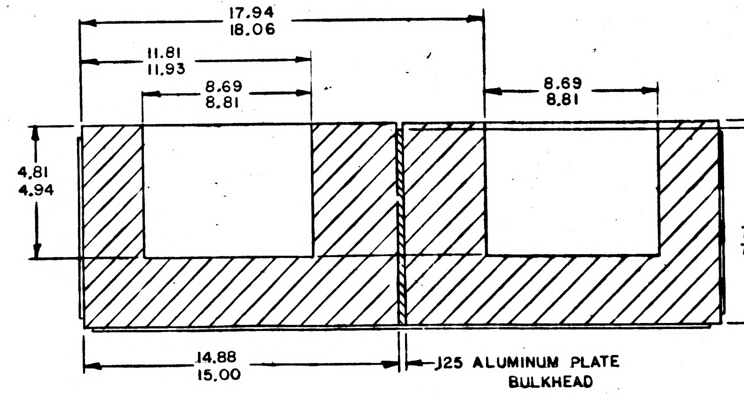
WITH EXTRUSIONS AND HARDWARE REMOVED



.44 .31 4 PLACES
1.69 1.81 4 PLACES
.93 .81 REF
D
D
6.31 6.44
12.69 12.81
25.56 25.44
1.69 1.81 4 PLACES
.93 .81 4 PLACES
.44 .31 REF
30.06 29.94

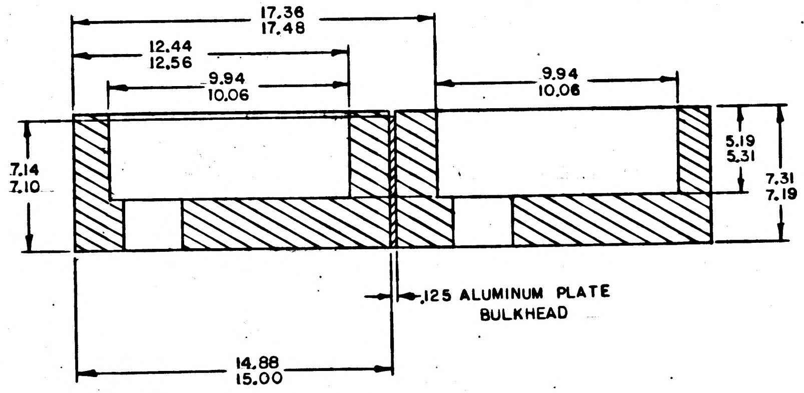
SECTION A-A

WITH EXTRUSIONS AND HARDWARE REMOVED



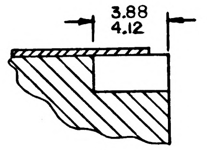
17.94 18.06
11.81 11.93
8.69 8.81
8.69 8.81
4.81 4.94
7.19 7.31
7.14 7.10
14.88 15.00
.125 ALUMINUM PLATE BULKHEAD

SECTION C-C



17.36 17.48
12.44 12.56
9.94 10.06
9.94 10.06
7.14 7.10
5.19 5.31
7.31 7.19
.125 ALUMINUM PLATE BULKHEAD
14.88 15.00

SECTION D-D



SECTION E-E

1006422 –

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN A. Doty DATE 21 Jul 65
CHECKED A. Kuhn 4 AUG 65
APPROVAL 12 Oct 65
APPROVAL D. O'Bryant 10/12/65
APPROVAL 10/11/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W 10/26/65
MIT APPROVAL A. Marano 12/1/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTAINER, SHIPPING AND STORAGE APOLLO UNIVERSAL DSKY

SOURCE CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	D	1006422

SCALE NONE
WT
SHEET 2 OF 2

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/1/65	[illegible]
1	REVISED PER CCA R25323 DR [illegible] CHK [illegible] APPD [illegible]	11-24-65	JHS
2	REVISED PER CCA R25474 DR W. Kelley CHK [illegible] APPD [illegible]	1/12/6	KFB
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER ETDRR 25921 DR [illegible] CHK [illegible] APPD PFD	4/4/66	[illegible]

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MD 1002019 ON THE INSIDE OF THE RIGHT HAND WALL (AS VIEWED FROM THE REAR OF CABINET) APPROXIMATELY 6 INCHES BELOW THE CEILING WITH THE FOLLOWING:

MANUFACTURER'S NAME AND/OR SYMBOL
MANUFACTURER'S PART NUMBER
NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

COLOR OF MARKING SHALL BE WHITE.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MD 1002215, CLASS I, CODE 6.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: AS SHOWN.

(2) MATERIAL: 14 GAUGE MINIMUM COLD ROLLED STEEL PER QQ-S-692, EXCEPT AS OTHERWISE NOTED.

(3) PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915 TYPE I ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.

PAINT: TWO COATS TT-E-529 SEMIGLOSS ENAMEL CLASS B. COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).

(4) MARKING: IN ACCORDANCE WITH NOTE 1.B.

B. VENDOR SUPPLIED DOCUMENTATION:

(1) EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

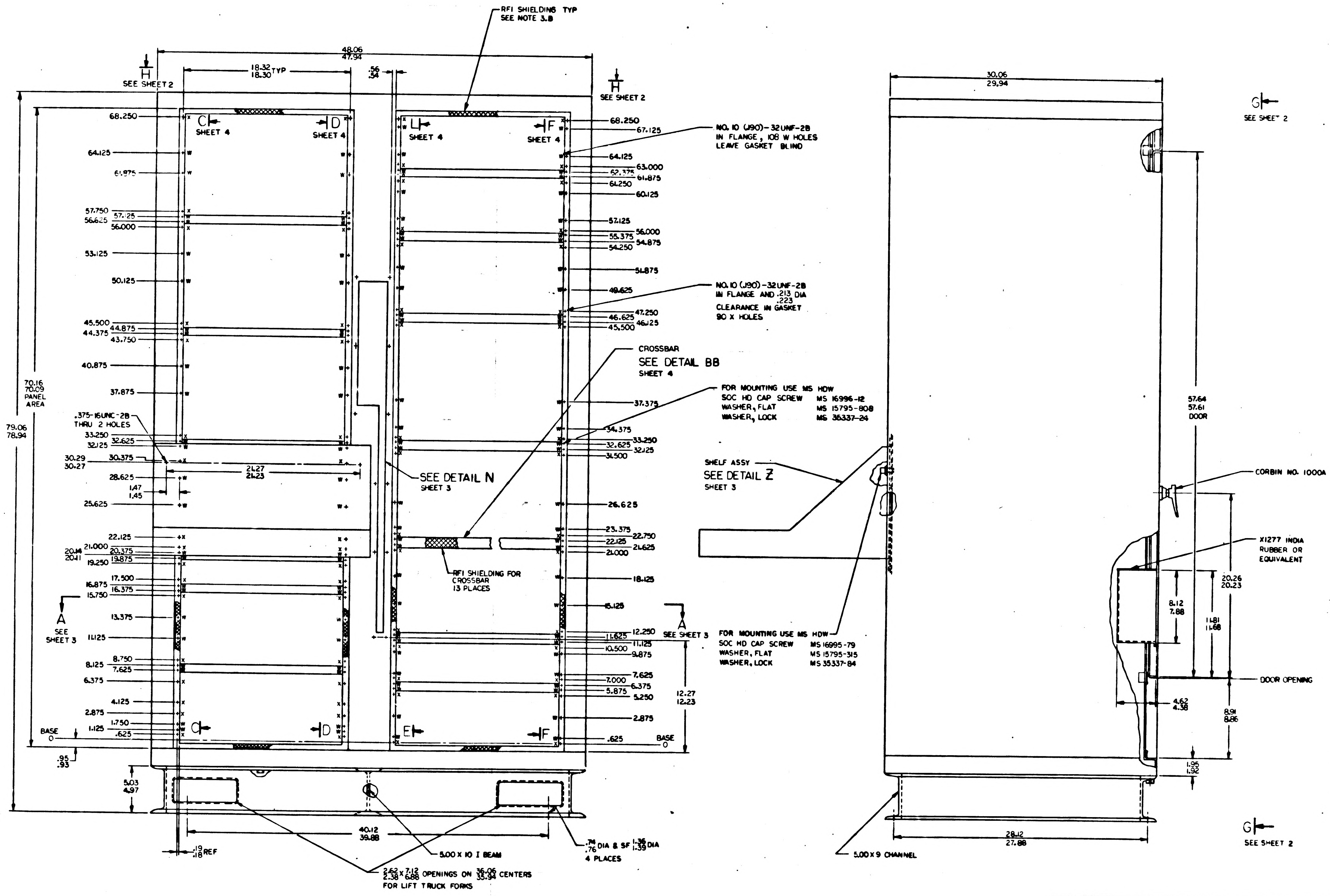
CERTIFICATE OF COMPLIANCE WITH DESIGN MATERIAL AND FINISH REQUIREMENTS.

3. DESIGN:

A. CONSTRUCTION: WELDED THROUGHOUT. ALL WELDS TO BE GROUND FLUSH.

B. RFI SHIELDING: CABINET SHALL BE CONSTRUCTED TO MEET REQUIREMENTS OF MIL-I-26600 FOR CLASS 3 EQUIPMENT. FREQUENCIES BETWEEN 150 KC AND 1000 MC SHALL BE ATTENUATED BY -60 DB MINIMUM. RFI GASKET MOUNTING HARDWARE TO BE 4-40 X .19 LONG FLAT HEAD MACHINE SCREWS PER MS 51959-12.

C. DOOR RETAINER CHAIN TO TERMINATE (EACH END) WITH SNAP HOOK OR SPIRAL TYPE RING (TO PREVENT SEPARATION IN USE).


H SEE SHEET 2
48.06 47.94
18.32 18.30 TYP
.56 .54
RFI SHIELDING TYP SEE NOTE 3.B
H SEE SHEET 2
C SHEET 4
D SHEET 4
L SHEET 4
F SHEET 4
68.250
64.125
61.875
57.750
57.125
56.625
56.000
53.125
50.125
45.500
44.875
44.375
43.750
40.875
37.875
70.16 70.09 PANEL AREA
79.06 78.94
.375-16UNC-2B THRU 2 HOLES
33.250
32.625
32.125
30.29 30.27
30.375
21.27 21.23
28.625
1.47 1.45
25.625
22.125
21.000
20.375
20.14 20.11
19.250
19.875
17.500
16.875
16.375
15.750
A SEE SHEET 3
13.375
11.125
8.750
8.125
7.625
6.375
4.125
2.875
1.750
1.125
.625
BASE 0
.95 .93
5.03 4.97
.19 .18 REF
40.12 39.88
67.125
64.125
63.000
62.375
61.875
61.250
60.125
57.125
56.000
55.375
54.875
54.250
51.875
49.625
47.250
46.625
46.125
45.500
37.375
34.375
33.250
32.625
32.125
31.500
26.625
23.375
22.750
22.125
21.625
21.000
18.125
15.125
12.250
11.625
11.125
10.500
9.875
7.625
7.000
6.375
5.875
5.250
2.875
.625
BASE 0
12.27 12.23
A SEE SHEET 3
E
NO. 10 (.190)-32UNF-2B IN FLANGE, 108 W HOLES LEAVE GASKET BLIND
NO. 10 (.190)-32UNF-2B IN FLANGE AND .213 .223 DIA CLEARANCE IN GASKET 90 X HOLES
CROSSBAR SEE DETAIL BB SHEET 4
FOR MOUNTING USE MS HDW
SOC HD CAP SCREW MS 16996-12
WASHER, FLAT MS 15795-808
WASHER, LOCK MS 35337-24
SEE DETAIL N SHEET 3
SHELF ASSY SEE DETAIL Z SHEET 3
RFI SHIELDING FOR CROSSBAR 13 PLACES
FOR MOUNTING USE MS HDW
SOC HD CAP SCREW MS 16995-79
WASHER, FLAT MS 15795-315
WASHER, LOCK MS 35337-84
5.00 X 10 I BEAM
.74 .76 DIA & SF 1.36 1.39 DIA 4 PLACES
2.62 2.38 X 7.12 6.88 OPENINGS ON 36.06 35.94 CENTERS FOR LIFT TRUCK FORKS
30.06 29.94
G SEE SHEET 2
57.64 57.61 DOOR
CORBIN NO. 1000A
X1277 INDIA RUBBER OR EQUIVALENT
20.26 20.23
8.12 7.88
11.81 11.68
DOOR OPENING
4.62 4.38
8.91 8.86
1.95 1.92
28.12 27.88
5.00 X 9 CHANNEL
G SEE SHEET 2

PART NO.	DESCRIPTION	DETAIL
1006423-001	CABINET ASSY INCLUDING -002,-004	
1006423-002	COVER ASSY INCLUDING -003	V
1006423-003	SCREW, REWORKED	Y
1006423-004	SHELF ASSY (REMOVEABLE)	Z

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±.02
DECIMALS .XXX ±.005
ANGLES ±1°
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE 2.A.2

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN [illegible] DATE 22 JUN65
CHECKED [illegible] 14 SEP 65
APPROVAL [illegible] 11/18/65
APPROVAL D. C. Bryant 7/4/65
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible] 1/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

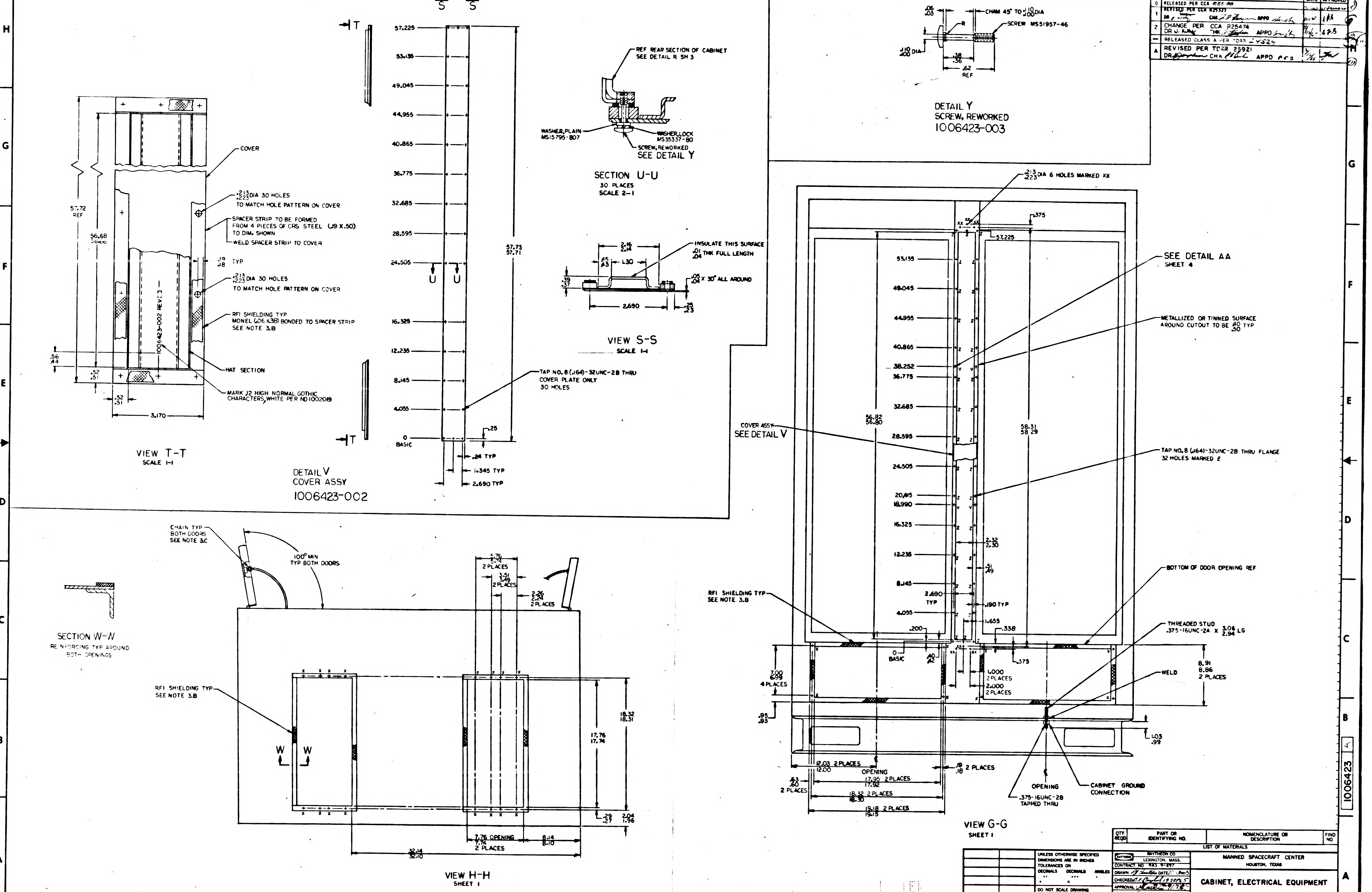
CODE IDENT NO. 49956
SIZE J
NASA DRAWING NO. 1006423
SCALE NONE
WT
SHEET 1 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25-98		
1	REVISED PER CCA R25323 DR CHK APPD		
2	CHANGE PER CCA R25474 DR W. Kulley CHK APPD		
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25921 DR CHK APPD RED	3/16/66	



S S
T
57.225
53.135
49.045
44.955
40.865
36.775
32.685
28.595
24.505
U U
16.325
12.235
8.145
4.055
0 BASIC
T
57.73
57.71
.25
.24 TYP
1.345 TYP
2.690 TYP
TAP NO. 8 (.164)-32UNC-2B THRU
COVER PLATE ONLY
30 HOLES
DETAIL V
COVER ASSY
1006423-002
COVER
.213/.223 DIA 30 HOLES
TO MATCH HOLE PATTERN ON COVER
SPACER STRIP TO BE FORMED
FROM 4 PIECES OF CRS STEEL (.19 X .50)
TO DIM. SHOWN
WELD SPACER STRIP TO COVER
.19/.18 TYP
.213/.223 DIA 30 HOLES
TO MATCH HOLE PATTERN ON COVER
RFI SHIELDING TYP
MONEL (.06 X.38) BONDED TO SPACER STRIP
SEE NOTE 3.B
HAT SECTION
MARK .12 HIGH NORMAL GOTHIC
CHARACTERS, WHITE PER ND 1002019
1006423-002 REV
57.72 REF
56.68
.56/.44
.52/.51
.52/.51
3.170
VIEW T-T
SCALE 1-1
REF REAR SECTION OF CABINET
SEE DETAIL R SH 3
WASHER, PLAIN
MS15795-807
WASHER, LOCK
MS35337-80
SCREW, REWORKED
SEE DETAIL Y
SECTION U-U
30 PLACES
SCALE 2-1
2.16/2.14
.45/.43
1.30
INSULATE THIS SURFACE
.01/.04 THK FULL LENGTH
.39/.37
.05/.04 X 30° ALL AROUND
2.690
.25/.23
VIEW S-S
SCALE 1-1
.06/.03
CHAM 45° TO .110/.100 DIA
R
SCREW MS51957-46
.110/.100 DIA
.38/.36
.62 REF
DETAIL Y
SCREW, REWORKED
1006423-003
.213/.223 DIA 6 HOLES MARKED XX
.375
57.225
SEE DETAIL AA
SHEET 4
METALLIZED OR TINNED SURFACE
AROUND CUTOUT TO BE .40/.50 TYP
53.135
49.045
44.955
40.865
38.252
36.775
32.685
28.595
24.505
20.415
18.990
16.325
12.235
8.145
4.055
56.82
56.80
58.31
58.29
COVER ASSY
SEE DETAIL V
TAP NO. 8 (.164)-32UNC-2B THRU FLANGE
32 HOLES MARKED Z
2.32/2.30
.51/.49
2.690 TYP
.190 TYP
1.655
.200
.338
0 BASIC
.40/.42
.375
1.000
2 PLACES
2.000
2 PLACES
BOTTOM OF DOOR OPENING REF
THREADED STUD
.375-16UNC-2A X 3.06/2.94 LG
WELD
8.91
8.86
2 PLACES
RFI SHIELDING TYP
SEE NOTE 3.B
7.00/6.99
4 PLACES
.95/.93
1.03/.99
12.03 2 PLACES
12.00
OPENING
17.95 2 PLACES
17.92
18.32 2 PLACES
18.30
19.18 2 PLACES
19.15
.19/.18 2 PLACES
.63/.60
2 PLACES
OPENING
.375-16UNC-2B
TAPPED THRU
CABINET GROUND
CONNECTION
VIEW G-G
SHEET 1
SECTION W-W
REINFORCING TYP AROUND
BOTH OPENINGS
CHAIN TYP
BOTH DOORS
SEE NOTE 3.C
100° MIN
TYP BOTH DOORS
5.76/5.74
2 PLACES
3.51/3.49
2 PLACES
2.26/2.24
2 PLACES
RFI SHIELDING TYP
SEE NOTE 3.B
W W
17.76
17.74
18.32
18.31
.29/.27
2.04
1.96
7.76 OPENING
7.74
2 PLACES
8.14
8.10
32.14
32.10
VIEW H-H
SHEET 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO
LEXINGTON, MASS.
CONTRACT NO NAS 9-497
DRAWN DATE 22 JUN 65
CHECKED 19 SEP 65
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

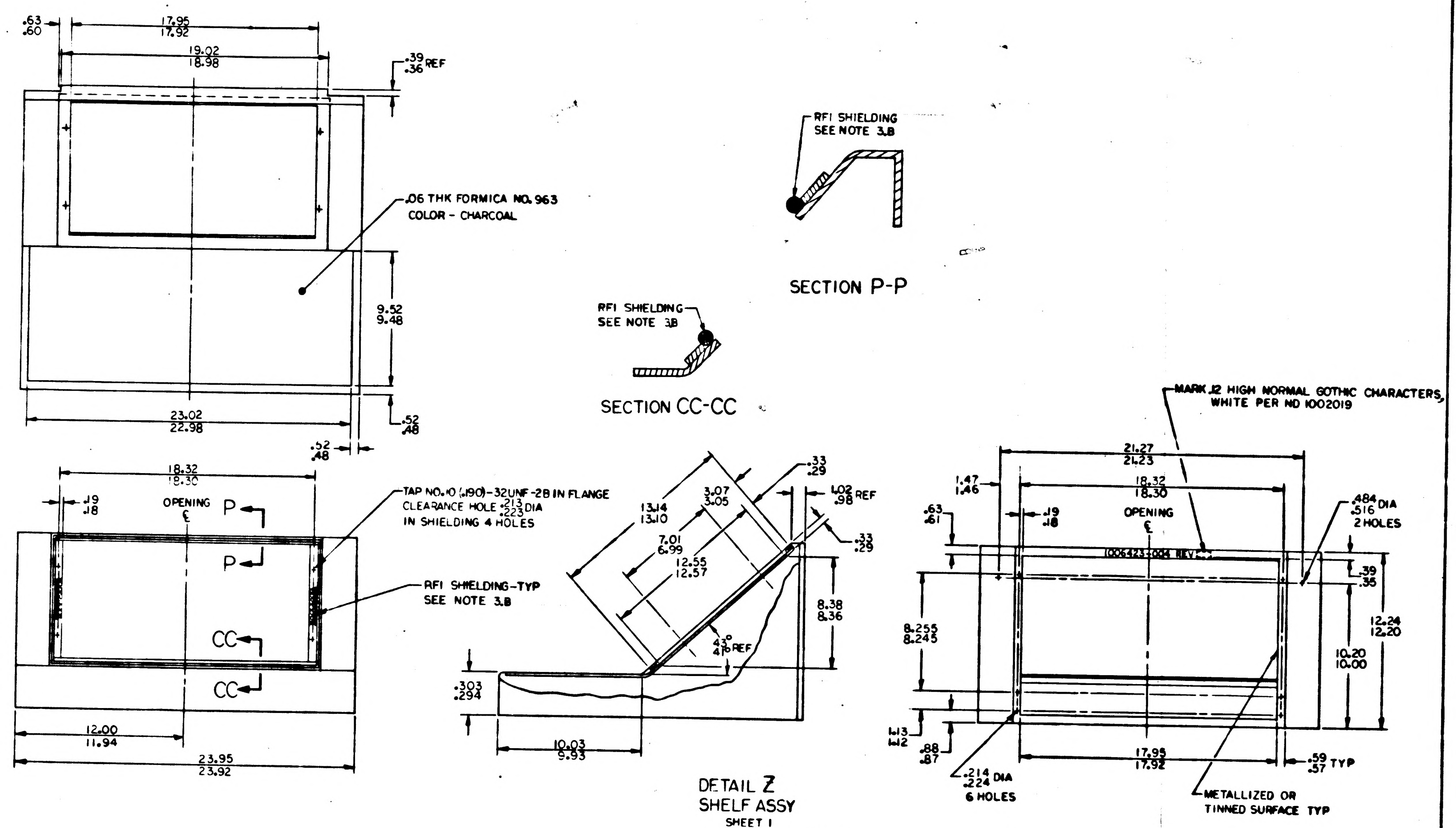
CODE IDENT NO. 49956
SIZE J
NASA DRAWING NO. 1006423
SCALE NONE
WT
SHEET 2 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423 A

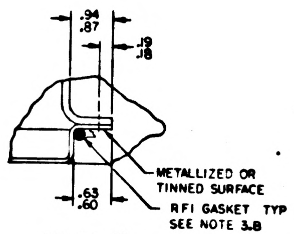
1006423 A

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25100	9/1/65	G Haran
1	REVISED PER CCA R25323 DR CHK APPD	11/22/65	
2	CHANGE PER CCA R25474 DR W. Kelly CHK APPD	11/17/65	
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25921 DR CHK APPD P.E.D.	2/14/66	



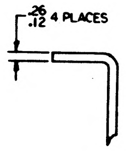
.63
.60
17.95
17.92
19.02
18.98
.39
.36 REF
.06 THK FORMICA NO. 963
COLOR - CHARCOAL
9.52
9.48
23.02
22.98
.52
.48
.52
.48
RFI SHIELDING
SEE NOTE 3.B
SECTION P-P
RFI SHIELDING
SEE NOTE 3.B
SECTION CC-CC
18.32
18.30
.19
.18
OPENING
℄
P
P
CC
CC
TAP NO. 10 (.190)-32UNF-2B IN FLANGE
CLEARANCE HOLE .213/.223 DIA
IN SHIELDING 4 HOLES
RFI SHIELDING-TYP
SEE NOTE 3.B
12.00
11.94
23.95
23.92
13.14
13.10
3.07
3.05
7.01
6.99
12.55
12.57
.33
.29
1.02
.98 REF
.33
.29
8.38
8.36
43°
41° REF
.303
.294
10.03
9.93
MARK .12 HIGH NORMAL GOTHIC CHARACTERS,
WHITE PER ND 1002019
21.27
21.23
18.32
18.30
1.47
1.46
.19
.18
OPENING
℄
.63
.61
1006423-004 REV
.484
.516 DIA
2 HOLES
.39
.35
8.255
8.245
12.24
12.20
10.20
10.00
1.13
1.12
.88
.87
.214
.224 DIA
6 HOLES
17.95
17.92
.59
.57 TYP
METALLIZED OR
TINNED SURFACE TYP

DETAIL Z
SHELF ASSY
SHEET 1
1006423-004



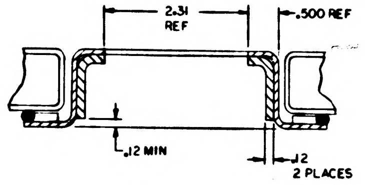
.94
.87
.19
.18
.63
.60
METALLIZED OR
TINNED SURFACE
RFI GASKET TYP
SEE NOTE 3.B

DETAIL B
4 PLACES



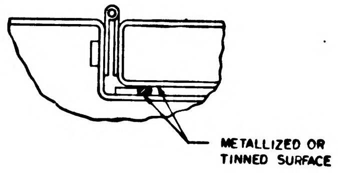
.26
.12 4 PLACES

DETAIL M



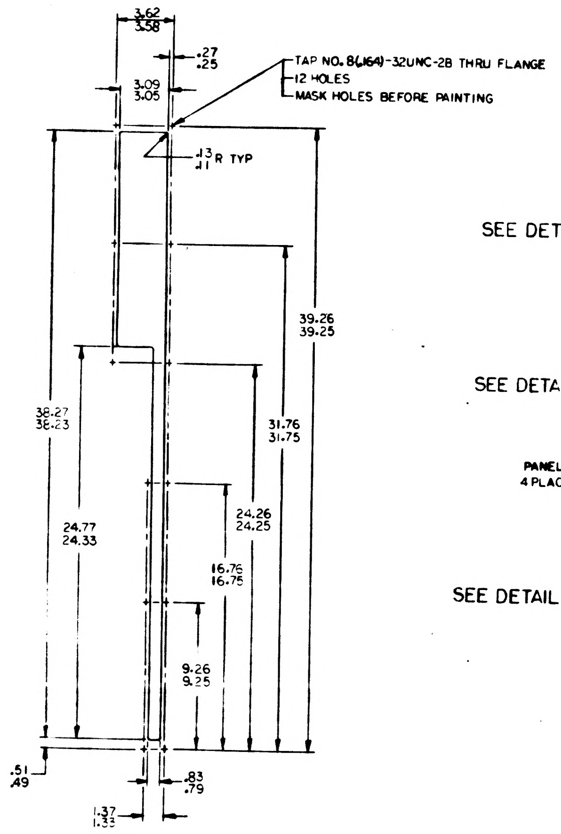
2.31
REF
.500 REF
.12 MIN
.12
2 PLACES

DETAIL R



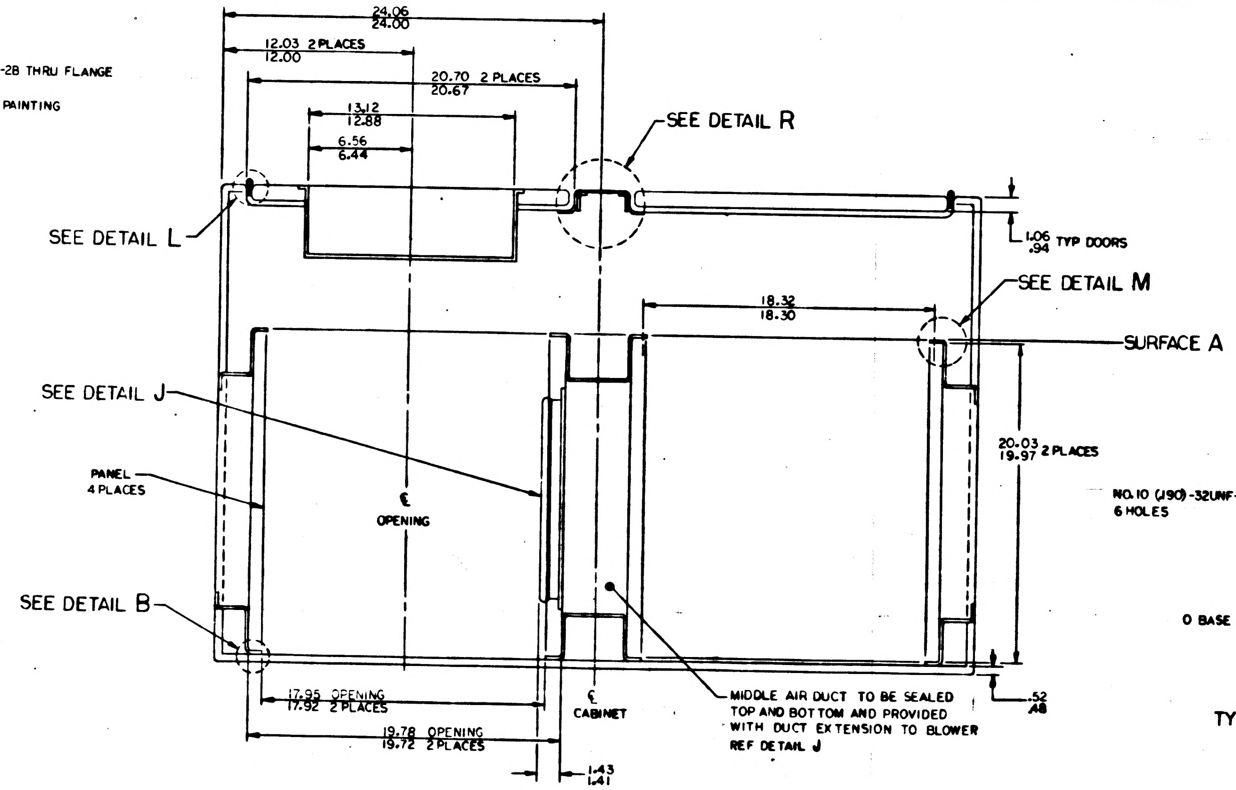
METALLIZED OR
TINNED SURFACE

DETAIL L
2 PLACES



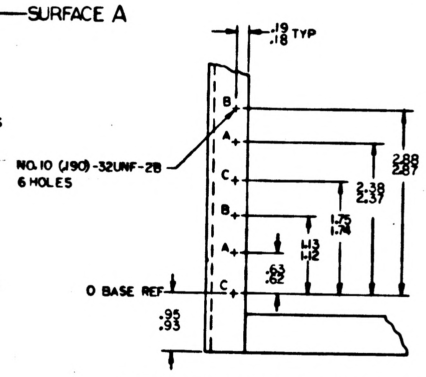
3.62
3.58
.27
.25
TAP NO. 8(.164)-32UNC-2B THRU FLANGE
12 HOLES
MASK HOLES BEFORE PAINTING
3.09
3.05
.13
.11 R TYP
39.26
39.25
38.27
38.23
31.76
31.75
24.77
24.33
24.26
24.25
16.76
16.75
9.26
9.25
.51
.49
.83
.79
1.37
1.33

DETAIL N
SHEET 1



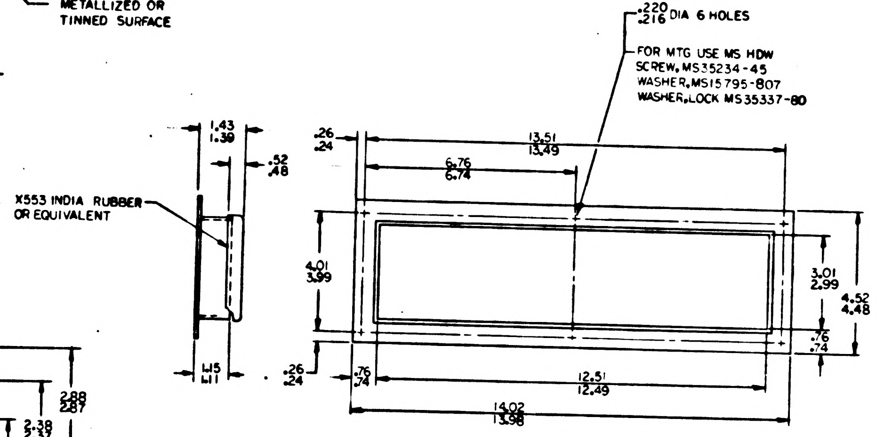
24.06
24.00
12.03 2 PLACES
12.00
20.70 2 PLACES
20.67
13.12
12.88
6.56
6.44
SEE DETAIL R
SEE DETAIL L
1.06
.94 TYP DOORS
SEE DETAIL M
18.32
18.30
SURFACE A
SEE DETAIL J
PANEL
4 PLACES
℄
OPENING
20.03
19.97 2 PLACES
SEE DETAIL B
17.95 OPENING
17.92 2 PLACES
℄
CABINET
MIDDLE AIR DUCT TO BE SEALED
TOP AND BOTTOM AND PROVIDED
WITH DUCT EXTENSION TO BLOWER
REF DETAIL J
.52
.48
19.78 OPENING
19.72 2 PLACES
1.43
1.41

SECTION A-A
SHEET 1



.19
.18 TYP
NO. 10 (.190)-32UNF-2B
6 HOLES
B
A
C
B
A
C
2.88
2.87
2.38
2.37
1.75
1.74
1.13
1.12
.63
.62
0 BASE REF
.95
.93

TYP REPEATING HOLE PATTERN - SURFACE A



.220
.216 DIA 6 HOLES
FOR MTG USE MS HDW
SCREW, MS35234-45
WASHER, MS15795-807
WASHER, LOCK MS35337-80
1.43
1.39
.52
.48
X553 INDIA RUBBER
OR EQUIVALENT
1.15
1.11
.26
.24
13.51
13.49
6.76
6.74
4.01
3.99
3.01
2.99
4.52
4.48
.76
.74
.26
.24
.76
.74
12.51
12.49
14.02
13.98

DETAIL J

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE 2 JUN65
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

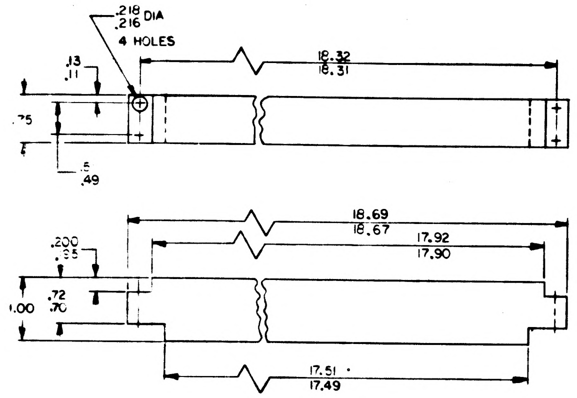
CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423
SCALE NONE	WT	SHEET 3 OF 4

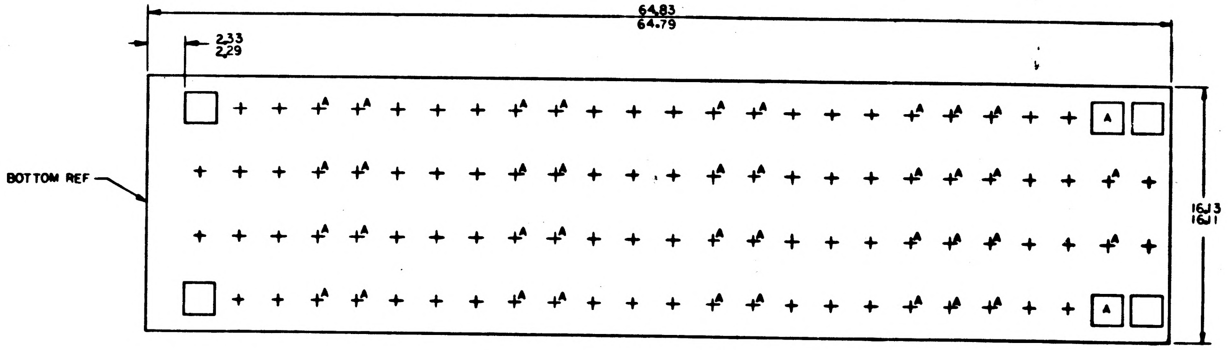
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423 A

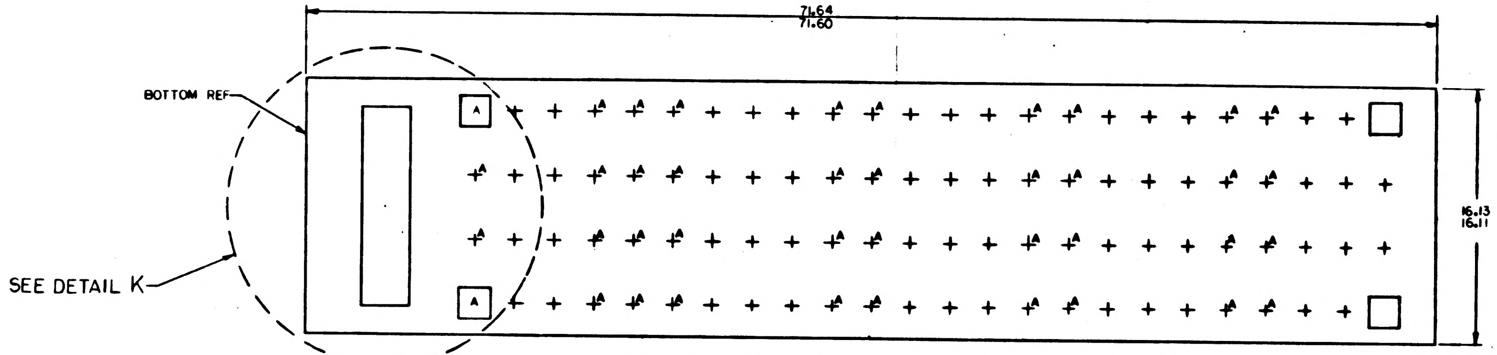
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25.38	9 ?65	O. Harans
1	REVISED PER CCA R25323 DR J. Doty CHK — APPD	11-2-65	
2	CHANGE PER CCA R25474 DR W. Kelly CHK APPD	11-4-65	
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25921 DR CHK APPD PED	2-14-66	


.218
.216 DIA
4 HOLES
.13
.11
.75
.5
.49
18.32
18.31
18.69
18.67
17.92
17.90
.200
.195
.72
.70
1.00
17.51
17.49

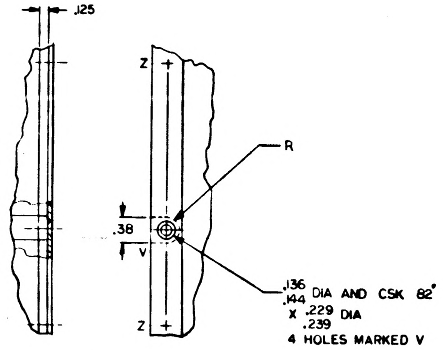
DETAIL BB
CROSSBAR
13 PLACES
SHEET 1


64.83
64.79
2.33
2.29
BOTTOM REF
16.13
16.11
A

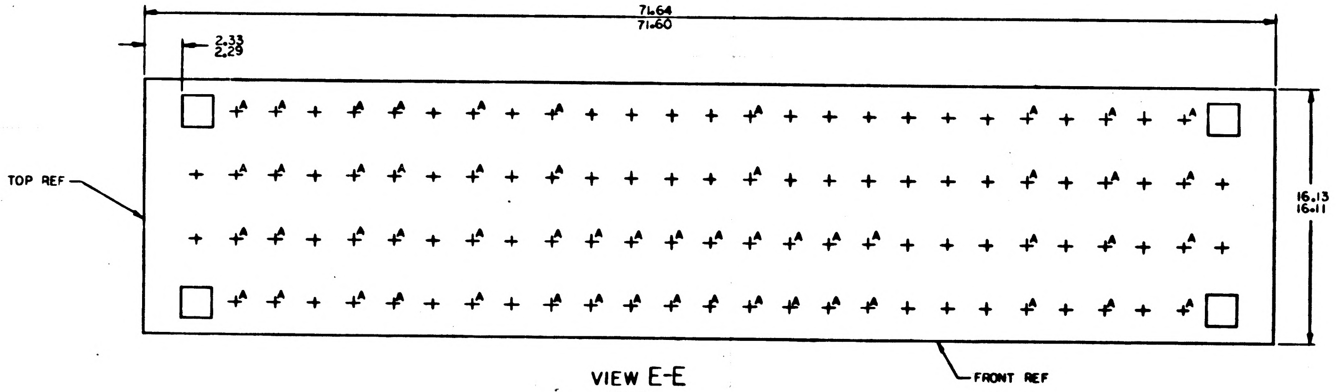
VIEW C-C
SHEET 1
SHOWN ROTATED 90° CW


71.64
71.60
BOTTOM REF
SEE DETAIL K
16.13
16.11
A

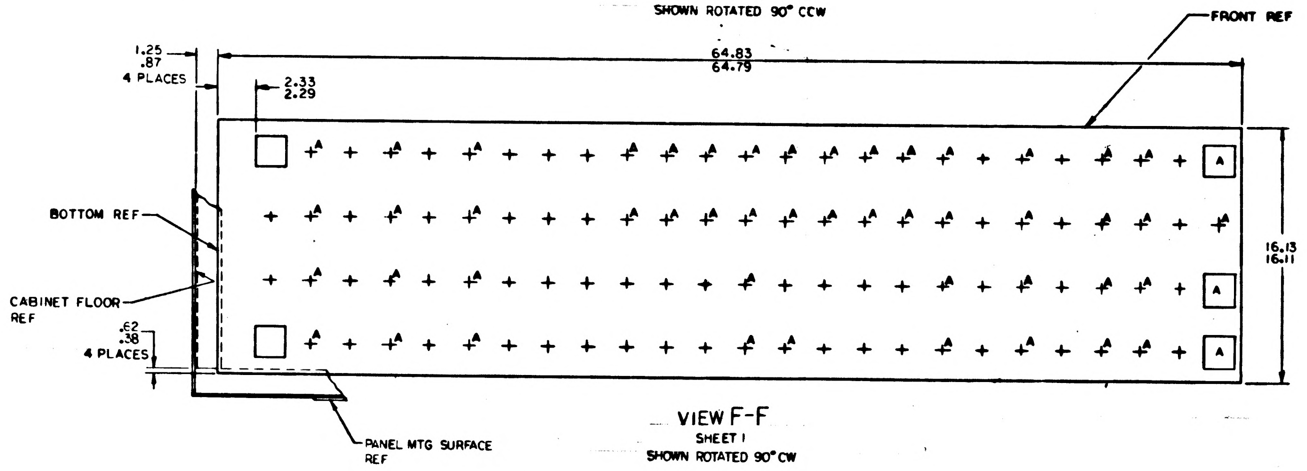
VIEW D-D
SHEET 1
SHOWN ROTATED 90° CW


.125
Z
R
.38
V
.136
.144 DIA AND CSK 82°
X .229
.239 DIA
4 HOLES MARKED V

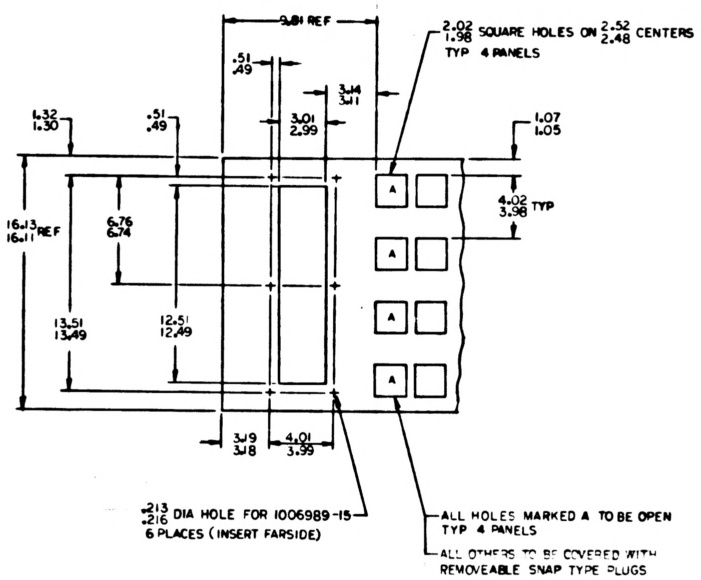
DETAIL AA
2 PLACES


71.64
71.60
2.33
2.29
TOP REF
16.13
16.11
FRONT REF
A

VIEW E-E
SHEET 1
SHOWN ROTATED 90° CCW


1.25
.87
4 PLACES
64.83
64.79
2.33
2.29
FRONT REF
BOTTOM REF
CABINET FLOOR REF
.62
.38
4 PLACES
16.13
16.11
PANEL MTG SURFACE REF
A

VIEW F-F
SHEET 1
SHOWN ROTATED 90° CW


9.81 REF
.51
.49
3.14
3.11
3.01
2.99
1.32
1.30
.51
.49
2.02
1.98 SQUARE HOLES ON 2.52
2.48 CENTERS
TYP 4 PANELS
1.07
1.05
4.02
3.98 TYP
16.13
16.11 REF
6.76
6.74
13.51
13.49
12.51
12.49
3.19
3.18
4.01
3.99
A
.213
.216 DIA HOLE FOR 1006989-15
6 PLACES (INSERT FARSIDE)
ALL HOLES MARKED A TO BE OPEN
TYP 4 PANELS
ALL OTHERS TO BE COVERED WITH
REMOVEABLE SNAP TYPE PLUGS

DETAIL K
SCALE NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS 9-497
DRAWN DATE 22 JUN 65
CHECKED 14 SEP 65
APPROVAL
APPROVAL D.
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423

SCALE NONE WT SHEET 4 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423	B

SYM	REVISIONS DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	4/1/65	[illegible]
1	REVISED PER CCA R25323 DR J. [illegible] CHK [illegible] APPD [illegible]	11-2-65	JHS
2	REVISED PER CCA R25474 DR W. Kelley CHK A. Kaplan APPD [illegible]	11/11/65	R.F.S.
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25921 DR [illegible] CHK [illegible] APPD P.C.D.	3/4/66	[illegible]
B	REVISED PER TDRR 29059 DR. [illegible] CHK A. Kaplan APPD P.C.D.	3/14/66	[illegible]

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 ON THE INSIDE OF THE RIGHT HAND WALL (AS VIEWED FROM THE REAR OF CABINET) APPROXIMATELY 6 INCHES BELOW THE CEILING WITH THE FOLLOWING:

      MANUFACTURER'S NAME AND/OR SYMBOL
      MANUFACTURER'S PART NUMBER
      NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

      COLOR OF MARKING SHALL BE WHITE.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      (1) DIMENSIONS: AS SHOWN.

      (2) MATERIAL: 14 GAUGE MINIMUM COLD ROLLED STEEL PER QQ-S-692, EXCEPT AS OTHERWISE NOTED.

      (3) PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915 TYPE I ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.

      PAINT: TWO COATS TT-E-529 SEMIGLOSS ENAMEL CLASS B. COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).

      (4) MARKING: IN ACCORDANCE WITH NOTE 1.B.

   B. VENDOR SUPPLIED DOCUMENTATION:

      (1) EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

      CERTIFICATE OF COMPLIANCE WITH DESIGN MATERIAL AND FINISH REQUIREMENTS.

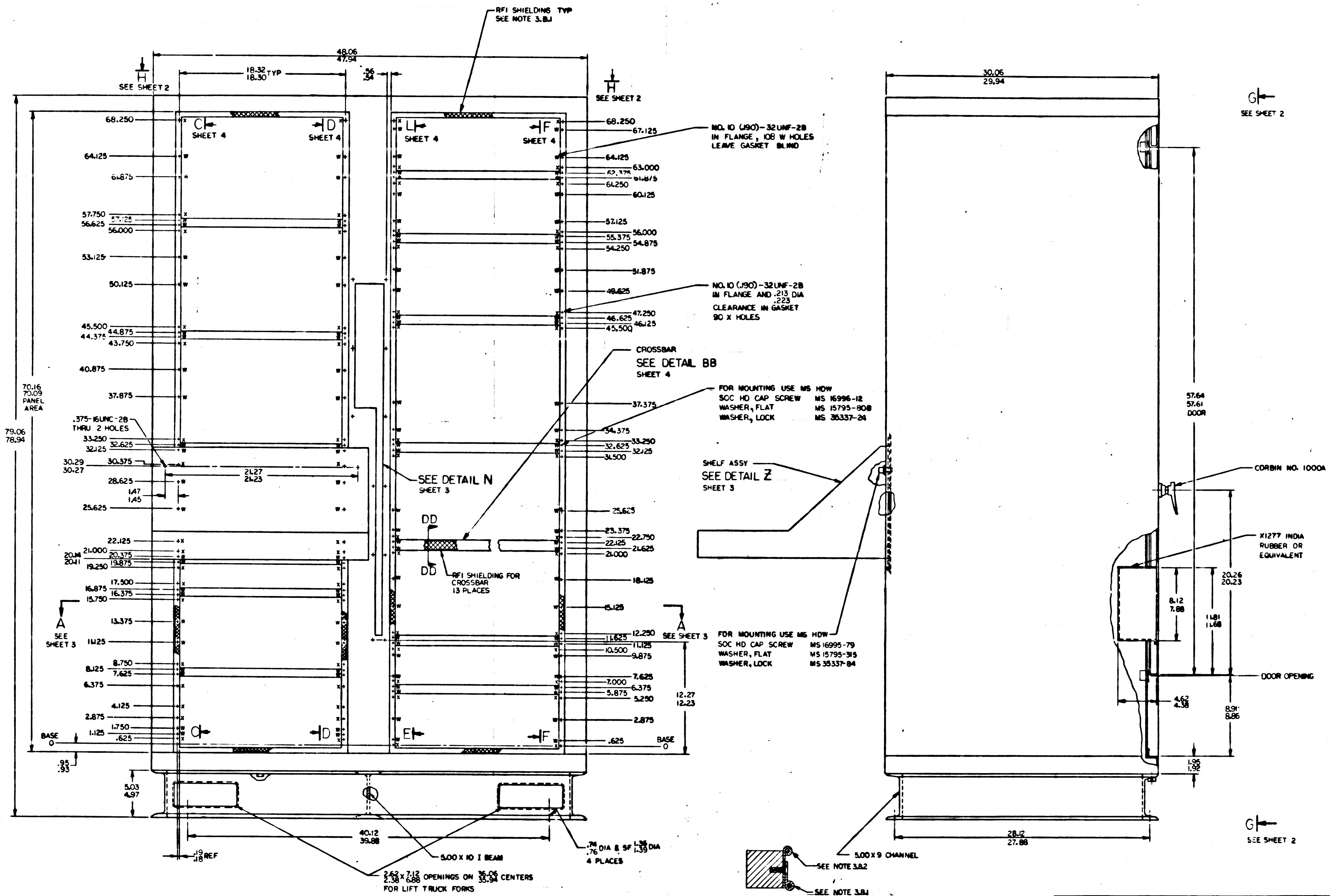
3. DESIGN:

   A. CONSTRUCTION: WELDED THROUGHOUT. ALL WELDS TO BE GROUND FLUSH.

   B. RFI SHIELDING: CABINET SHALL BE CONSTRUCTED TO MEET REQUIREMENTS OF MIL-I-26600 FOR CLASS 3 EQUIPMENT. FREQUENCIES BETWEEN 150 KC AND 1000 MC SHALL BE ATTENUATED BY -60 DB MINIMUM. RFI GASKET MOUNTING HARDWARE TO BE 4-40 X .19 LONG FLAT HEAD MACHINE SCREWS PER MS 51959-12.

      1. GASKET AND MOUNTING STRIP — TECHNICAL WIRE PRODUCTS PART NO. 83-12152 OR EQUIVALENT
      2. GASKET — TECHNICAL WIRE PRODUCTS PART NO. 1380 OR EQUIVALENT
      3. GASKET — TECHNICAL WIRE PRODUCTS PART NO 10126 OR EQUIVALENT

   C. DOOR RETAINER CHAIN TO TERMINATE (EACH END) WITH SNAP HOOK OR SPIRAL TYPE RING (TO PREVENT SEPARATION IN USE)



RFI SHIELDING TYP SEE NOTE 3.B.1
48.06 / 47.94
18.32 / 18.30 TYP
.56 / .54
H SEE SHEET 2
C SHEET 4
D SHEET 4
L SHEET 4
F SHEET 4
68.250
67.125
64.125
61.875
57.750
57.125
56.625
56.000
53.125
50.125
45.500
44.875
44.375
43.750
40.875
37.875
70.16 / 70.09 PANEL AREA
79.06 / 78.94
.375-16UNC-2B THRU 2 HOLES
33.250
32.625
32.125
30.29 / 30.27
30.375
21.27 / 21.23
28.625
1.47 / 1.45
25.625
22.125
20.46 / 20.41
21.000
20.375
19.875
19.250
17.500
16.875
16.375
15.750
A SEE SHEET 3
13.375
11.125
8.750
8.125
7.625
6.375
4.125
2.875
1.750
1.125
.625
BASE 0
.95 / .93
5.03 / 4.97
40.12 / 39.88
.19 / .18 REF
2.62 / 2.38 X 7.12 / 6.88 OPENINGS ON 36.06 / 35.94 CENTERS FOR LIFT TRUCK FORKS
5.00 X 10 I BEAM
.78 / .76 DIA & SF 1.38 / 1.39 DIA 4 PLACES
SEE DETAIL N SHEET 3
DD
RFI SHIELDING FOR CROSSBAR 13 PLACES
E
NO. 10 (.190)-32UNF-2B IN FLANGE, 108 W HOLES LEAVE GASKET BLIND
63.000
62.375
61.875
61.250
60.125
55.375
54.875
54.250
51.875
NO. 10 (.190)-32UNF-2B IN FLANGE AND .213 / .223 DIA CLEARANCE IN GASKET 90 X HOLES
49.625
47.250
46.625
46.125
CROSSBAR SEE DETAIL BB SHEET 4
FOR MOUNTING USE MS HDW
SOC HD CAP SCREW MS 16996-12
WASHER, FLAT MS 15795-808
WASHER, LOCK MS 35337-24
37.375
34.375
31.500
SHELF ASSY SEE DETAIL Z SHEET 3
25.625
23.375
22.750
21.625
18.125
15.125
12.250
11.625
10.500
9.875
A SEE SHEET 3
FOR MOUNTING USE MS HDW
SOC HD CAP SCREW MS 16995-79
WASHER, FLAT MS 15795-315
WASHER, LOCK MS 35337-84
7.000
5.875
5.250
12.27 / 12.23
30.06 / 29.94
G SEE SHEET 2
57.64 / 57.61 DOOR
CORBIN NO. 1000A
X1277 INDIA RUBBER OR EQUIVALENT
20.26 / 20.23
8.12 / 7.88
11.81 / 11.68
DOOR OPENING
4.62 / 4.38
8.91 / 8.86
1.96 / 1.92
28.12 / 27.88
5.00 X 9 CHANNEL
SEE NOTE 3.B.2
SEE NOTE 3.B.1
SECTION DD-DD

PART NO.	DESCRIPTION	DETAIL
1006423-00	CABINET ASSY INCLUDING -002,-004	
1006423-002	COVER ASSY INCLUDING -003	V
1006423-003	SCREW, REWORKED	Y
1006423-004	SHELF ASSY (REMOVEABLE)	Z

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±.02 DECIMALS .XXX ±.005 ANGLES ±1°
DO NOT SCALE DRAWING
MATERIAL SEE NOTE 2.A.2

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN [illegible] DATE 22 JUN 65
CHECKED [illegible] 14 SEP 65
APPROVAL [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

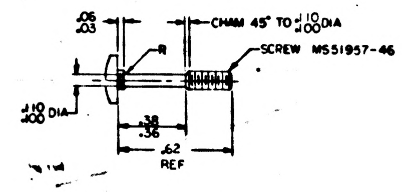
CODE IDENT NO. 49956 SIZE J NASA DRAWING NO. 1006423
SCALE NONE WT SHEET 1 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

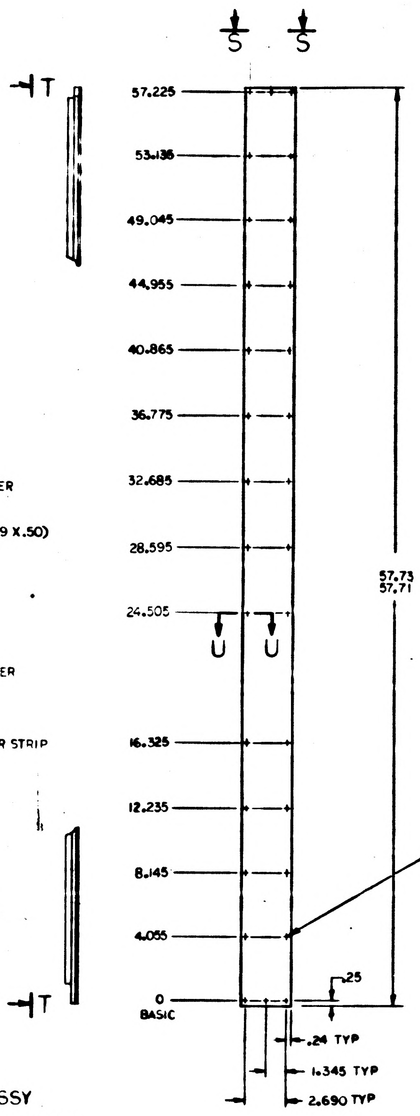
1006423 B

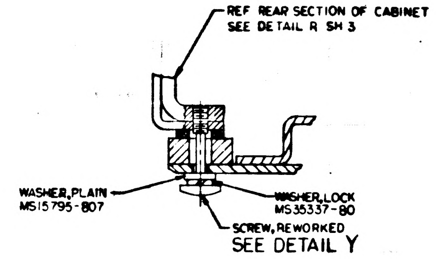
1006423 B

SYM	DESCRIPTION	DATE	APPROVED
REVISIONS			
0	RELEASED PER CCA R2598		
1	REVISED PER CCA R25323 DR CHK APPD		
2	CHANGE PER CCA R25474 DR W. Kelly CHK APPD		
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25921 DR CHK APPD		
B	REVISED PER TDRR 29059 DR. CHK. APPD.	/66	

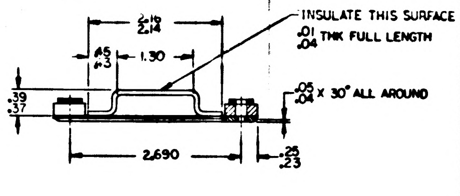

.06
.03
CHAM 45° TO .110 .100 DIA
R
SCREW MS51957-46
.110 .100 DIA
.38
.36
.62
REF

DETAIL Y
SCREW, REWORKED
1006423-003


S
S
T
T
57.225
53.135
49.045
44.955
40.865
36.775
32.685
28.595
24.505
U
U
16.325
12.235
8.145
4.055
0
BASIC
.25
57.73
57.71
.24 TYP
1.345 TYP
2.690 TYP

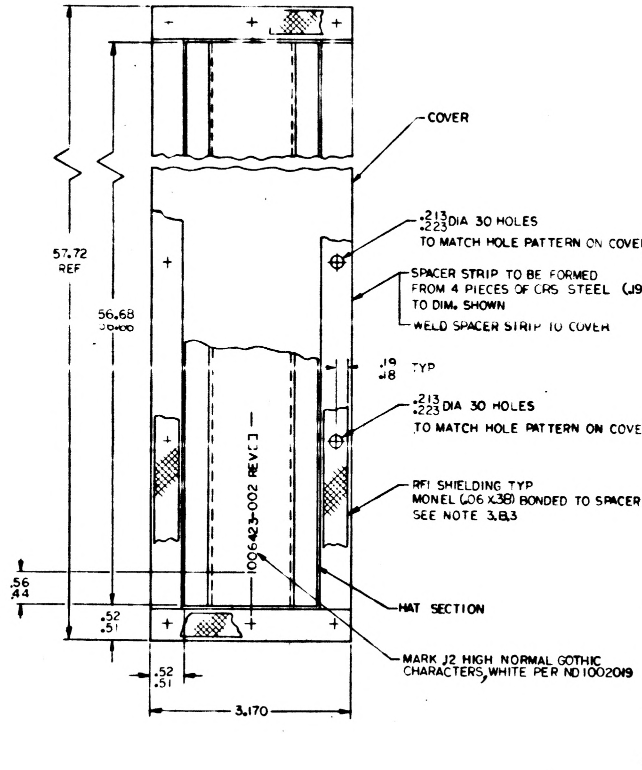

REF REAR SECTION OF CABINET
SEE DETAIL R SH 3
WASHER, PLAIN
MS15795-807
WASHER, LOCK
MS35337-80
SCREW, REWORKED
SEE DETAIL Y

SECTION U-U
30 PLACES
SCALE 2-1


2.16
2.14
.45
.43
1.30
INSULATE THIS SURFACE
.01 .04 THK FULL LENGTH
.39
.37
.05 .04 X 30° ALL AROUND
2.690
.25
.23

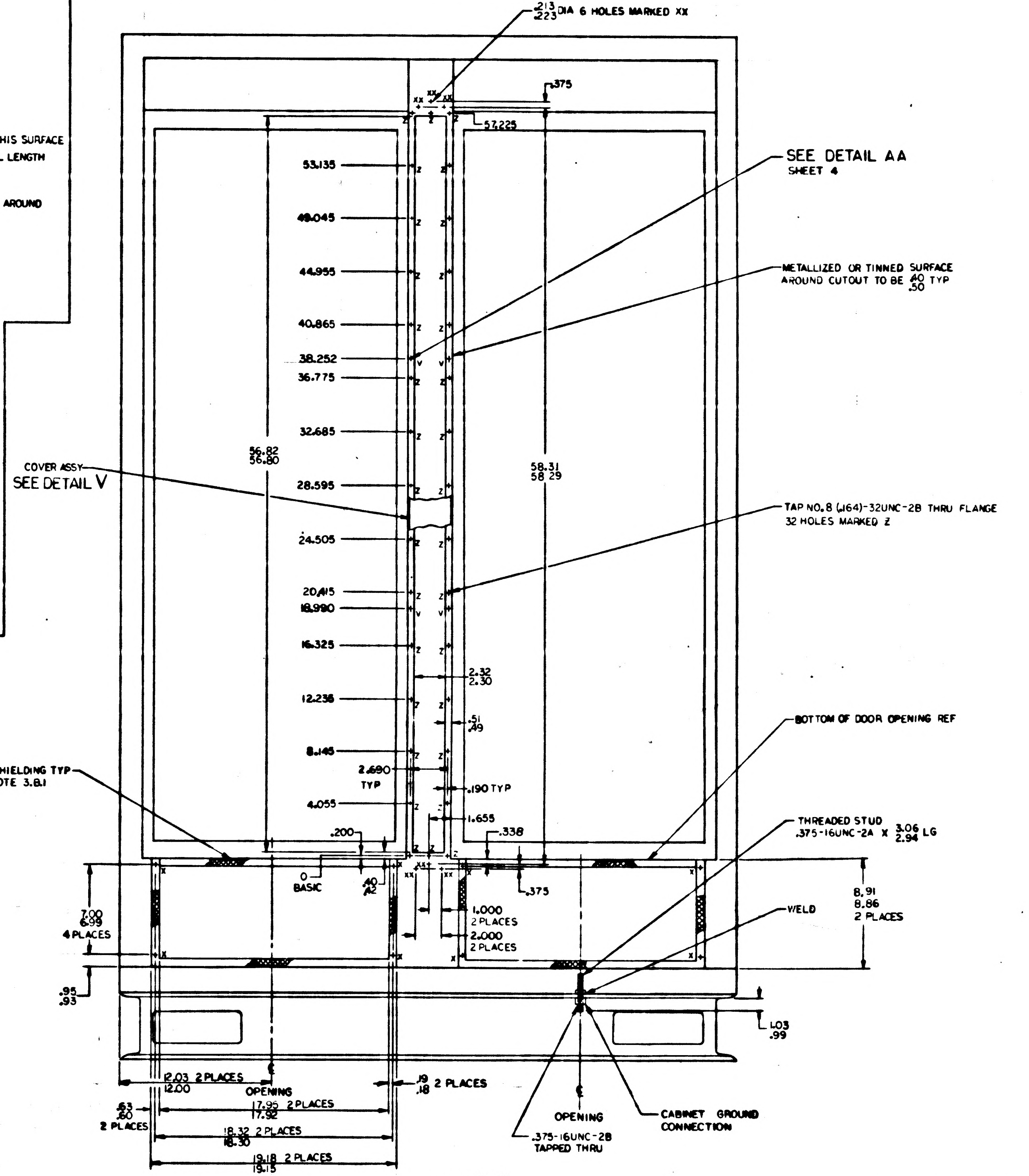
VIEW S-S
SCALE 1-1

TAP NO. 8 (.164)-32UNC-2B THRU
COVER PLATE ONLY
30 HOLES

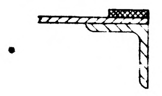

COVER
.213 .223 DIA 30 HOLES
TO MATCH HOLE PATTERN ON COVER
SPACER STRIP TO BE FORMED
FROM 4 PIECES OF CRS STEEL (.19 X .50)
TO DIM. SHOWN
WELD SPACER STRIP TO COVER
.19
.18
TYP
.213 .223 DIA 30 HOLES
TO MATCH HOLE PATTERN ON COVER
RFI SHIELDING TYP
MONEL (.06 X .38) BONDED TO SPACER STRIP
SEE NOTE 3.B.3
HAT SECTION
MARK .12 HIGH NORMAL GOTHIC
CHARACTERS, WHITE PER ND1002019
1006423-002 REV
57.72
REF
56.68
56.66
.56
.44
.52
.51
.52
.51
3.170

VIEW T-T
SCALE 1-1

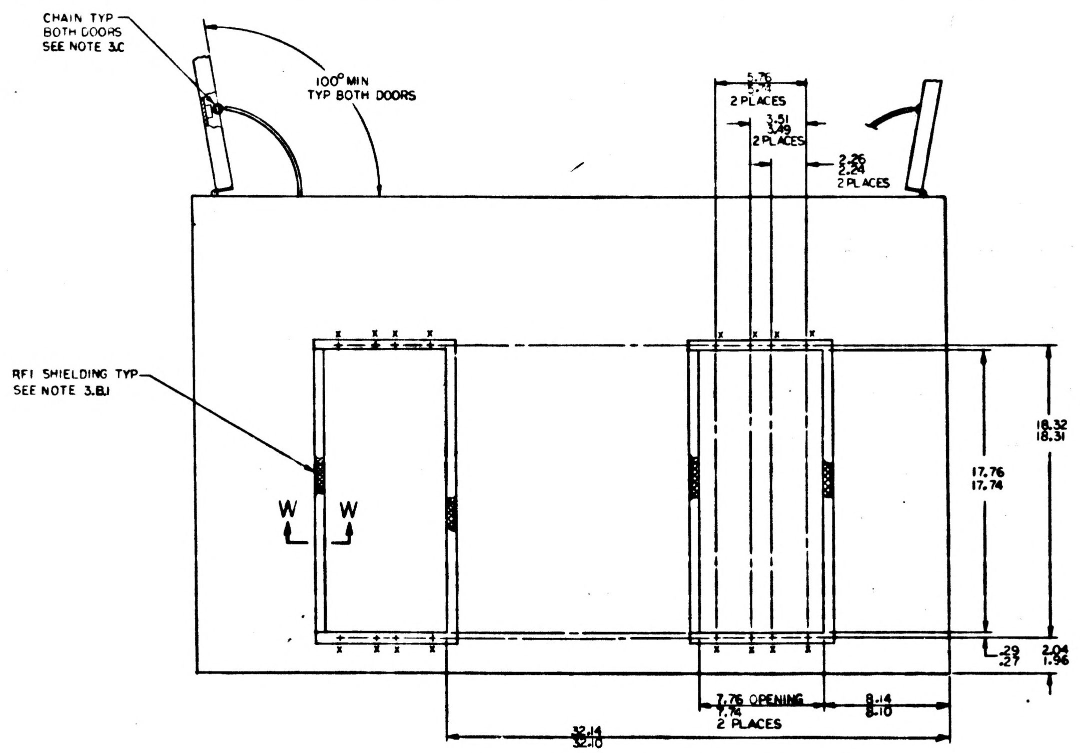
DETAIL V
COVER ASSY
1006423-002


.213 .223 DIA 6 HOLES MARKED XX
.375
57.225
SEE DETAIL AA
SHEET 4
53.135
49.045
44.955
40.865
METALLIZED OR TINNED SURFACE
AROUND CUTOUT TO BE .40 .50 TYP
38.252
36.775
32.685
56.82
56.80
58.31
58.29
COVER ASSY
SEE DETAIL V
28.595
24.505
TAP NO. 8 (.164)-32UNC-2B THRU FLANGE
32 HOLES MARKED Z
20.415
18.990
16.325
2.32
2.30
12.235
.51
.49
BOTTOM OF DOOR OPENING REF
RFI SHIELDING TYP
SEE NOTE 3.B.1
8.145
2.690
TYP
.190 TYP
4.055
1.655
.200
.338
THREADED STUD
.375-16UNC-2A X 3.06 2.94 LG
0
BASIC
.40
.42
.375
7.00
6.99
4 PLACES
1.000
2 PLACES
2.000
2 PLACES
WELD
8.91
8.86
2 PLACES
.95
.93
1.03
.99
12.03 2 PLACES
12.00
OPENING
.19 .18 2 PLACES
.63
.60
2 PLACES
17.95 2 PLACES
17.92
18.32 2 PLACES
18.30
19.18 2 PLACES
19.15
OPENING
.375-16UNC-2B
TAPPED THRU
CABINET GROUND
CONNECTION

VIEW G-G
SHEET 1



SECTION W-W
REINFORCING TYP AROUND
BOTH OPENINGS


CHAIN TYP
BOTH DOORS
SEE NOTE 3.C
100° MIN
TYP BOTH DOORS
5.76
5.74
2 PLACES
3.51
3.49
2 PLACES
2.26
2.24
2 PLACES
RFI SHIELDING TYP
SEE NOTE 3.B.1
W
W
18.32
18.31
17.76
17.74
.29
.27
2.04
1.96
7.76 OPENING
7.74
2 PLACES
8.14
8.10
32.14
32.10

VIEW H-H
SHEET 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±	RAYTHEON CO. LEXINGTON, MASS.
APPLICATION		DO NOT SCALE DRAWING	CONTRACT NO NAS 9-497
		MATERIAL	DRAWN DATE 22 JUN65
			CHECKED 19 SEP65
			APPROVAL
			APPROVAL
			APPROVAL
			NASA APPROVAL
			MIT APPROVAL
			MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

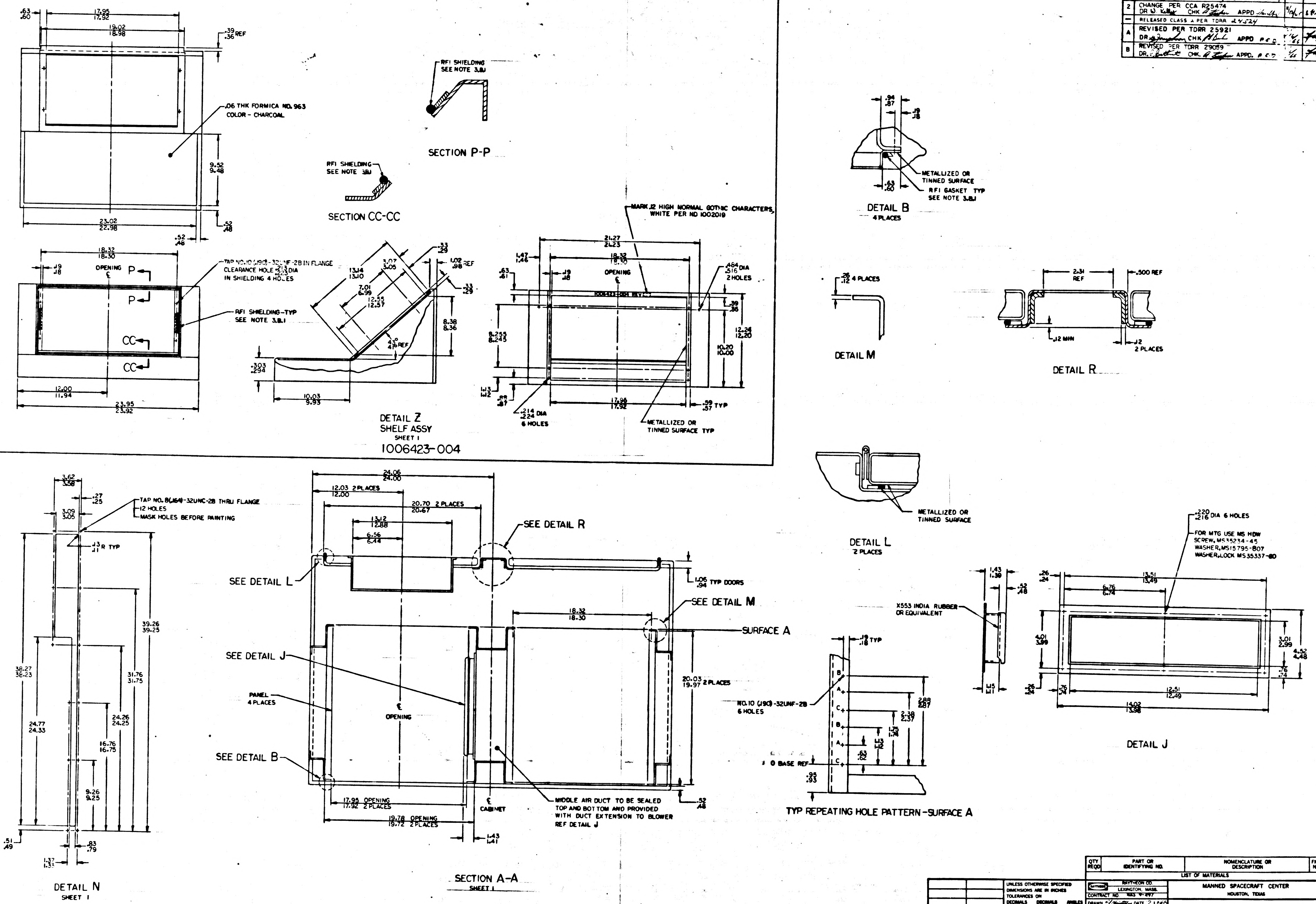
CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423
SCALE NONE	WT	SHEET 2 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423 B

1006423 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25100	9/17/65	A Harson
1	REVISED PER CCA R25323 DR J. CHK APPD		
2	CHANGE PER CCA R25474 DR W. Kelley CHK APPD	11/17/65	
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25921 DR CHK APPD		
B	REVISED PER TDRR 29059 DR. CHK. APPD.		



.63 .60
17.95 17.92
19.02 18.98
.39 .36 REF
.06 THK FORMICA NO. 963 COLOR - CHARCOAL
9.52 9.48
23.02 22.98
.52 .48
RFI SHIELDING SEE NOTE 3.B.I
SECTION P-P
RFI SHIELDING SEE NOTE 3.B.I
SECTION CC-CC
18.32 18.30
.19 .18
OPENING ℄
P
CC
TAP NO.10 (.190)-32UNF-2B IN FLANGE CLEARANCE HOLE .213 .223 DIA IN SHIELDING 4 HOLES
RFI SHIELDING-TYP SEE NOTE 3.B.I
12.00 11.94
23.95 23.92
13.14 13.10
3.07 3.05
7.01 6.99
12.55 12.57
.33 .29
1.02 .98 REF
8.38 8.36
43° 41° REF
.303 .294
10.03 9.93
DETAIL Z
SHELF ASSY
SHEET 1
1006423-004
MARK .12 HIGH NORMAL GOTHIC CHARACTERS, WHITE PER ND 1002019
21.27 21.23
1.47 1.46
18.32 18.30
.63 .61
OPENING ℄
1006423-004 REV
.484 .516 DIA 2 HOLES
.39 .35
8.255 8.245
12.24 12.20
10.20 10.00
1.13 1.12
.88 .87
.214 .224 DIA 6 HOLES
17.95 17.92
.59 .57 TYP
METALLIZED OR TINNED SURFACE TYP
.94 .87
.19 .18
METALLIZED OR TINNED SURFACE
RFI GASKET TYP SEE NOTE 3.B.I
.63 .60
DETAIL B
4 PLACES
.26 .12 4 PLACES
DETAIL M
2.31 REF
.500 REF
.12 MIN
.12 2 PLACES
DETAIL R
METALLIZED OR TINNED SURFACE
DETAIL L
2 PLACES
3.62 3.58
.27 .25
3.09 3.05
TAP NO. 8(.164)-32UNC-2B THRU FLANGE
12 HOLES
MASK HOLES BEFORE PAINTING
.13 .11 R TYP
39.26 39.25
38.27 38.23
31.76 31.75
24.77 24.33
24.26 24.25
16.76 16.75
9.26 9.25
.51 .49
.83 .79
1.37 1.33
DETAIL N
SHEET 1
24.06 24.00
12.03 2 PLACES 12.00
20.70 2 PLACES 20.67
13.12 12.88
6.56 6.44
SEE DETAIL R
SEE DETAIL L
1.06 .94 TYP DOORS
SEE DETAIL M
18.32 18.30
SURFACE A
SEE DETAIL J
PANEL 4 PLACES
℄ OPENING
20.03 19.97 2 PLACES
SEE DETAIL B
17.95 OPENING 17.92 2 PLACES
19.78 OPENING 19.72 2 PLACES
℄ CABINET
1.43 1.41
MIDDLE AIR DUCT TO BE SEALED TOP AND BOTTOM AND PROVIDED WITH DUCT EXTENSION TO BLOWER REF DETAIL J
.52 .48
SECTION A-A
SHEET 1
.19 .18 TYP
NO.10 (.190)-32UNF-2B 6 HOLES
B
A
C
2.88 2.87
2.38 2.37
1.75 1.74
1.13 1.12
.63 .62
0 BASE REF
.95 .93
TYP REPEATING HOLE PATTERN-SURFACE A
1.43 1.39
.52 .48
X553 INDIA RUBBER OR EQUIVALENT
1.15 1.11
.220 .216 DIA 6 HOLES
FOR MTG USE MS HDW
SCREW, MS35234-45
WASHER, MS15795-807
WASHER, LOCK MS35337-80
.26 .24
13.51 13.49
6.76 6.74
4.01 3.99
3.01 2.99
4.52 4.48
.76 .74
12.51 12.49
14.02 13.98
DETAIL J

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE 2 JUN 65
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE J
NASA DRAWING NO. 1006423
SCALE NONE
WT
SHEET 3 OF 4

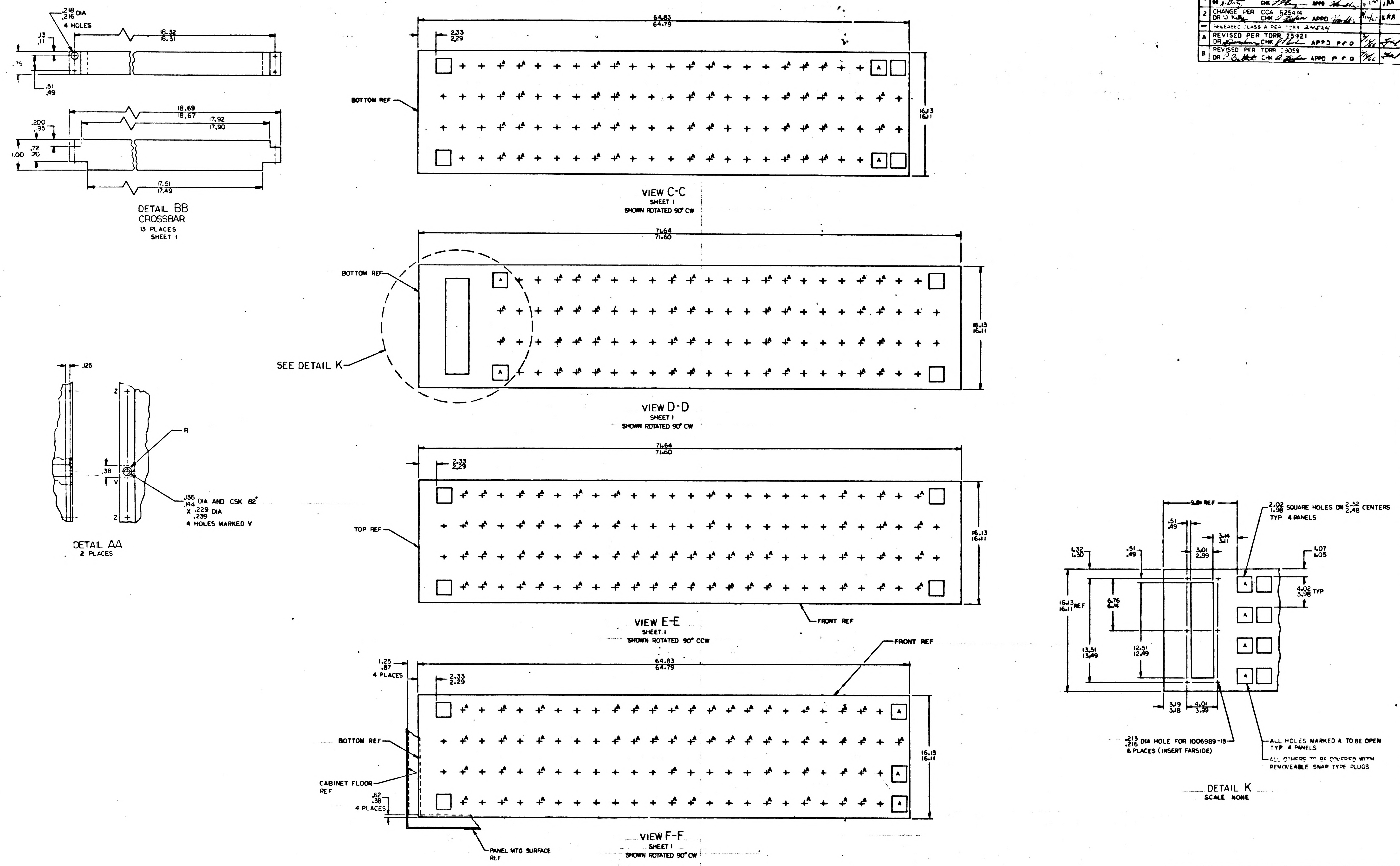
MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423 B

1006423 B

SYM	REVISIONS — DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25.38	9/1/65	U. Warren
1	REVISED PER CCA R25323 DR J. Doty CHK T. Fleming APPD Hendley	11-2-65	JRA
2	CHANGE PER CCA R25474 DR W. Kelly CHK A. Taylor APPD Hendley	11/4/65	JRA
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25921 DR [illegible] CHK [illegible] APPD P E D	3/4/66	[illegible]
B	REVISED PER TDRR 29059 DR P. Batt CHK A. Taylor APPD P E D	6/14/66	[illegible]



.218
.216 DIA
4 HOLES
.13
.11
.75
.51
.49
18.32
18.31
18.69
18.67
17.92
17.90
.200
.195
.72
.70
1.00
17.51
17.49
DETAIL BB
CROSSBAR
13 PLACES
SHEET 1
.125
Z
R
.38
V
.136
.144 DIA AND CSK 82°
X .229
.239 DIA
4 HOLES MARKED V
DETAIL AA
2 PLACES
64.83
64.79
2.33
2.29
BOTTOM REF
16.13
16.11
A
VIEW C-C
SHEET 1
SHOWN ROTATED 90° CW
71.64
71.60
BOTTOM REF
SEE DETAIL K
VIEW D-D
SHEET 1
SHOWN ROTATED 90° CW
TOP REF
FRONT REF
VIEW E-E
SHEET 1
SHOWN ROTATED 90° CCW
1.25
.87
4 PLACES
FRONT REF
BOTTOM REF
CABINET FLOOR REF
.62
.38
4 PLACES
PANEL MTG SURFACE REF
VIEW F-F
SHEET 1
SHOWN ROTATED 90° CW
9.81 REF
2.02
1.98 SQUARE HOLES ON 2.52
2.48 CENTERS
TYP 4 PANELS
.51
.49
3.14
3.11
3.01
2.99
1.32
1.30
1.07
1.05
4.02
3.98 TYP
16.13
16.11 REF
6.76
6.74
13.51
13.49
12.51
12.49
3.19
3.18
4.01
3.99
.213
.216 DIA HOLE FOR 1006989-15
6 PLACES (INSERT FARSIDE)
ALL HOLES MARKED A TO BE OPEN
TYP 4 PANELS
ALL OTHERS TO BE COVERED WITH
REMOVEABLE SNAP TYPE PLUGS
DETAIL K
SCALE NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.

CONTRACT NO	NAS 9-497
DRAWN	[illegible] DATE 22 JUN 65
CHECKED	C.K. English 14 SEP 65
APPROVAL	P. Cochran [illegible]
APPROVAL	D. O'Bryant [illegible]
APPROVAL	[illegible] 9/10/65
NASA APPROVAL	A. C. METZGER
MIT APPROVAL	W. Ruf [illegible]
MIT APPROVAL	[illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423
SCALE NONE	WT	SHEET 4 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423 B

SYM	DESCRIPTION	DATE	APPROVED
REVISIONS			
0	RELEASED PER CCA R25188		
1	REVISED PER CCA R25323 DR CHK APPD	11-24-65	JHS
2	REVISED PER CCA R25474 DR W. Kelby CHK A. Kaplan APPD		
—	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 ON THE INSIDE OF THE RIGHT HAND WALL (AS VIEWED FROM THE REAR OF CABINET) APPROXIMATELY 6 INCHES BELOW THE CEILING WITH THE FOLLOWING:

     MANUFACTURER'S NAME AND/OR SYMBOL

     MANUFACTURER'S PART NUMBER

     NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

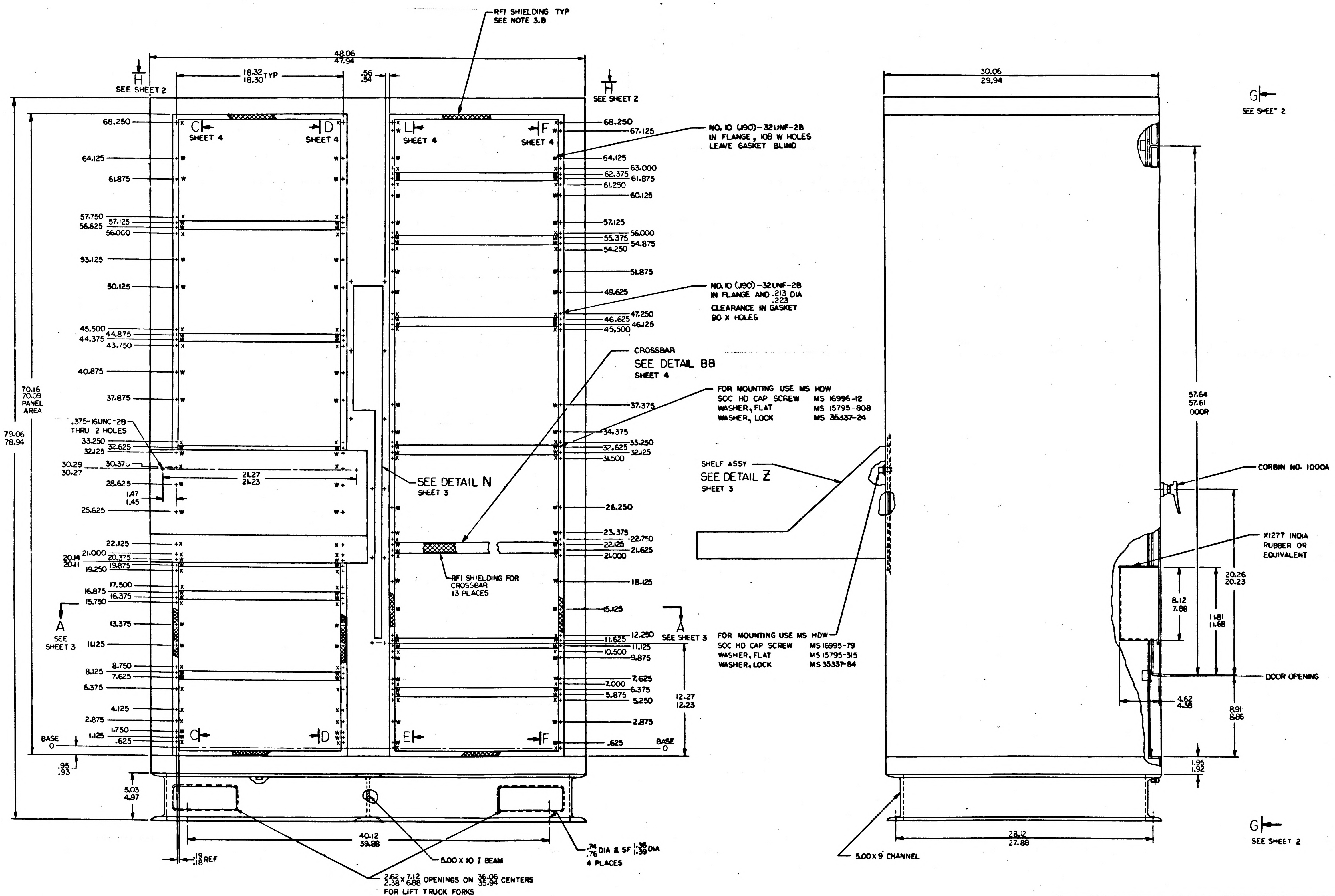
     COLOR OF MARKING SHALL BE WHITE.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS SHOWN.
     - (2) MATERIAL: 14 GAUGE MINIMUM COLD ROLLED STEEL PER QQ-S-692, EXCEPT AS OTHERWISE NOTED.
     - (3) PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915 TYPE I ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.

       PAINT: TWO COATS TT-E-529 SEMIGLOSS ENAMEL CLASS B. COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).
     - (4) MARKING: IN ACCORDANCE WITH NOTE 1.B.
   - B. VENDOR SUPPLIED DOCUMENTATION:
     - (1) EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

       CERTIFICATE OF COMPLIANCE WITH DESIGN MATERIAL AND FINISH REQUIREMENTS.

3. DESIGN:
   - A. CONSTRUCTION: WELDED THROUGHOUT. ALL WELDS TO BE GROUND FLUSH.
   - B. RFI SHIELDING: CABINET SHALL BE CONSTRUCTED TO MEET REQUIREMENTS OF MIL-I-26600 FOR CLASS 3 EQUIPMENT. FREQUENCIES BETWEEN 150 KC AND 1000 MC SHALL BE ATTENUATED BY -60 DB MINIMUM. RFI GASKET MOUNTING HARDWARE TO BE 4-40 X .19 LONG FLAT HEAD MACHINE SCREWS PER MS 51959-12.
   - C. DOOR RETAINER CHAIN TO TERMINATE (EACH END) WITH SNAP HOOK OR SPIRAL TYPE RING (TO PREVENT SEPARATION IN USE).


RFI SHIELDING TYP
SEE NOTE 3.B
48.06
47.94
18.32
18.30 TYP
.56
.54
H
SEE SHEET 2
C
SHEET 4
D
SHEET 4
L
SHEET 4
F
SHEET 4
68.250
67.125
64.125
63.000
62.375
61.875
61.250
60.125
57.750
57.125
56.625
56.000
55.375
54.875
54.250
53.125
51.875
50.125
49.625
47.250
46.625
46.125
45.500
44.875
44.375
43.750
40.875
37.875
37.375
34.375
33.250
32.625
32.125
31.500
30.375
30.29
30.27
28.625
26.250
25.625
23.375
22.750
22.125
21.625
21.000
20.375
20.14
20.11
19.875
19.250
18.125
17.500
16.875
16.375
15.750
15.125
13.375
12.250
11.625
11.125
10.500
9.875
8.750
8.125
7.625
7.000
6.375
5.875
5.250
4.125
2.875
1.750
1.125
.625
BASE
0
70.16
70.09
PANEL
AREA
79.06
78.94
.375-16UNC-2B
THRU 2 HOLES
21.27
21.23
1.47
1.45
SEE DETAIL N
SHEET 3
NO. 10 (.190)-32UNF-2B
IN FLANGE, 108 W HOLES
LEAVE GASKET BLIND
NO. 10 (.190)-32UNF-2B
IN FLANGE AND .213/.223 DIA
CLEARANCE IN GASKET
90 X HOLES
CROSSBAR
SEE DETAIL BB
SHEET 4
FOR MOUNTING USE MS HDW
SOC HD CAP SCREW MS 16996-12
WASHER, FLAT MS 15795-808
WASHER, LOCK MS 35337-24
SHELF ASSY
SEE DETAIL Z
SHEET 3
RFI SHIELDING FOR
CROSSBAR
13 PLACES
A
SEE SHEET 3
A
SEE
SHEET 3
FOR MOUNTING USE MS HDW
SOC HD CAP SCREW MS 16995-79
WASHER, FLAT MS 15795-315
WASHER, LOCK MS 35337-84
12.27
12.23
C
D
E
F
.95
.93
5.03
4.97
40.12
39.88
.19
.18 REF
5.00 X 10 I BEAM
.74/.76 DIA & SF 1.36/1.39 DIA
4 PLACES
2.62/2.38 X 7.12/6.88 OPENINGS ON 36.06/35.94 CENTERS
FOR LIFT TRUCK FORKS
30.06
29.94
G
SEE SHEET 2
57.64
57.61
DOOR
CORBIN NO. 1000A
X1277 INDIA
RUBBER OR
EQUIVALENT
20.26
20.23
8.12
7.88
11.81
11.68
DOOR OPENING
4.62
4.38
8.91
8.86
1.95
1.92
28.12
27.88
5.00 X 9 CHANNEL
G
SEE SHEET 2

PART NO.	DESCRIPTION	DETAIL
1006423-001	CABINET ASSY INCLUDING -002,-004	
1006423-002	COVER ASSY INCLUDING -003	V
1006423-003	SCREW, REWORKED	Y
1006423-004	SHELF ASSY (REMOVEABLE)	Z

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±.02 DECIMALS .XXX ±.005 ANGLES ±1°
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE 2.A.2

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE 22 JUN65
CHECKED B. V. 14 SEP 65
APPROVAL
APPROVAL D. D. Bryant
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

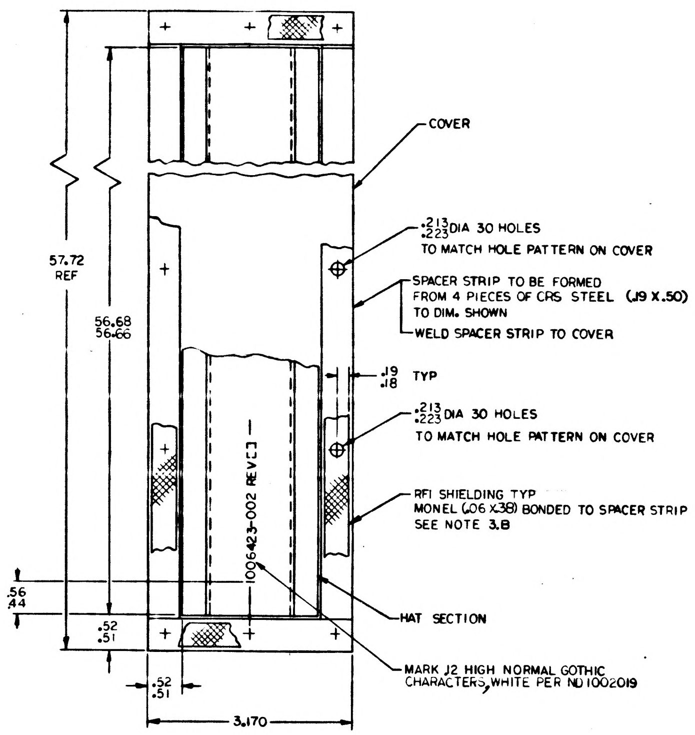
CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423
SCALE NONE	WT	SHEET 1 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423

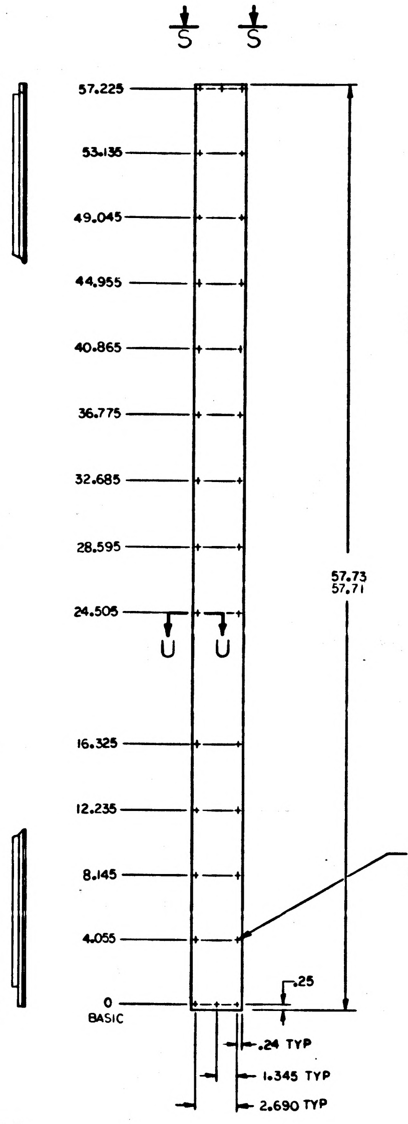
1006423 -

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25 35	9-7-65	A. Harano
1	REVISED PER CCA R25323 DR J. Doty CHK F. D. Forman APPD Hanley	11-2-65	R.R.S.
2	CHANGE PER CCA R25474 DR W. Kelley CHK Kaplan APPD Hanley	11/12/65	R.F.S.
—	RELEASED CLASS A PER TDRR 24752-		



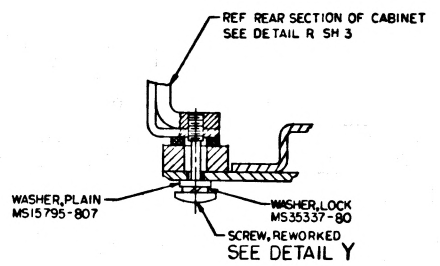
57.72 REF
56.68 56.66
COVER
.213 .223 DIA 30 HOLES TO MATCH HOLE PATTERN ON COVER
SPACER STRIP TO BE FORMED FROM 4 PIECES OF CRS STEEL (.19 X .50) TO DIM. SHOWN
WELD SPACER STRIP TO COVER
.19 .18 TYP
.213 .223 DIA 30 HOLES TO MATCH HOLE PATTERN ON COVER
1006423-002 REV[ ]
RFI SHIELDING TYP MONEL (.06 X .38) BONDED TO SPACER STRIP SEE NOTE 3.B
HAT SECTION
MARK .12 HIGH NORMAL GOTHIC CHARACTERS, WHITE PER ND 1002019
.56 .44
.52 .51
.52 .51
3.170

VIEW T-T
SCALE 1-1



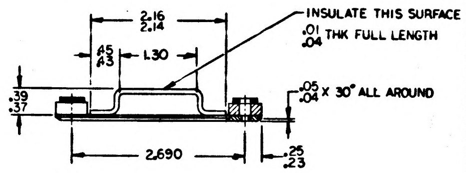
S S
T
T
57.225
53.135
49.045
44.955
40.865
36.775
32.685
28.595
24.505
U U
16.325
12.235
8.145
4.055
0 BASIC
57.73 57.71
.25
.24 TYP
1.345 TYP
2.690 TYP
TAP NO. 8 (.164)-32UNC-2B THRU COVER PLATE ONLY 30 HOLES

DETAIL V
COVER ASSY
1006423-002



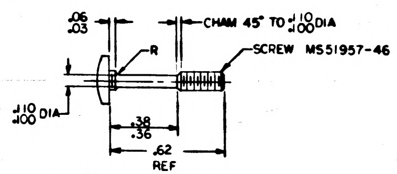
REF REAR SECTION OF CABINET SEE DETAIL R SH 3
WASHER, PLAIN MS15795-807
WASHER, LOCK MS35337-80
SCREW, REWORKED SEE DETAIL Y

SECTION U-U
30 PLACES
SCALE 2-1



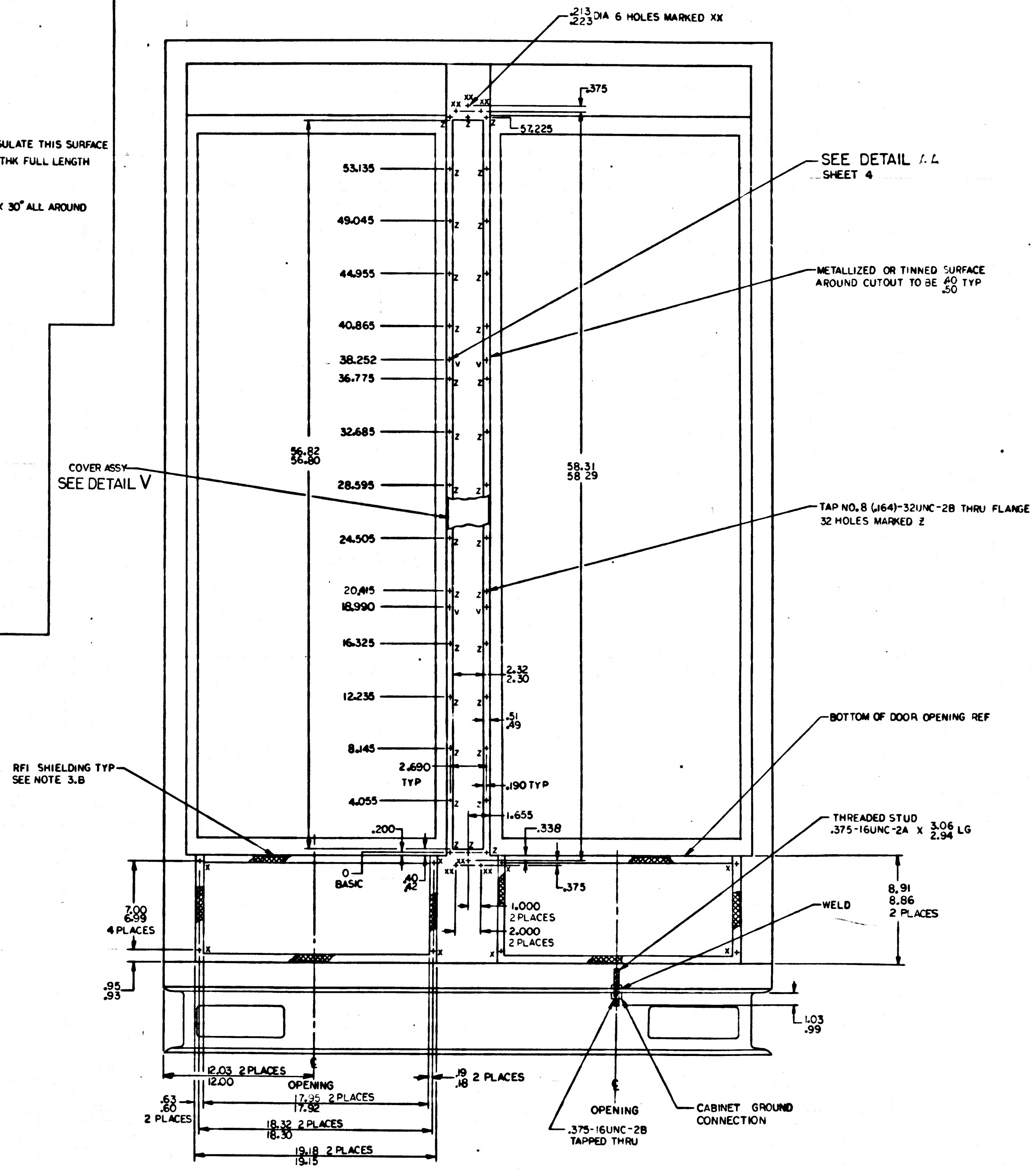
2.16 2.14
.45 .43
1.30
INSULATE THIS SURFACE .01 .04 THK FULL LENGTH
.39 .37
.05 .04 X 30° ALL AROUND
2.690
.25 .23

VIEW S-S
SCALE 1-1



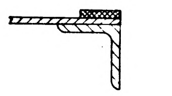
.06 .03
CHAM 45° TO .110 .100 DIA
R
SCREW MS51957-46
.110 .100 DIA
.38 .36
.62 REF

DETAIL Y
SCREW, REWORKED
1006423-003

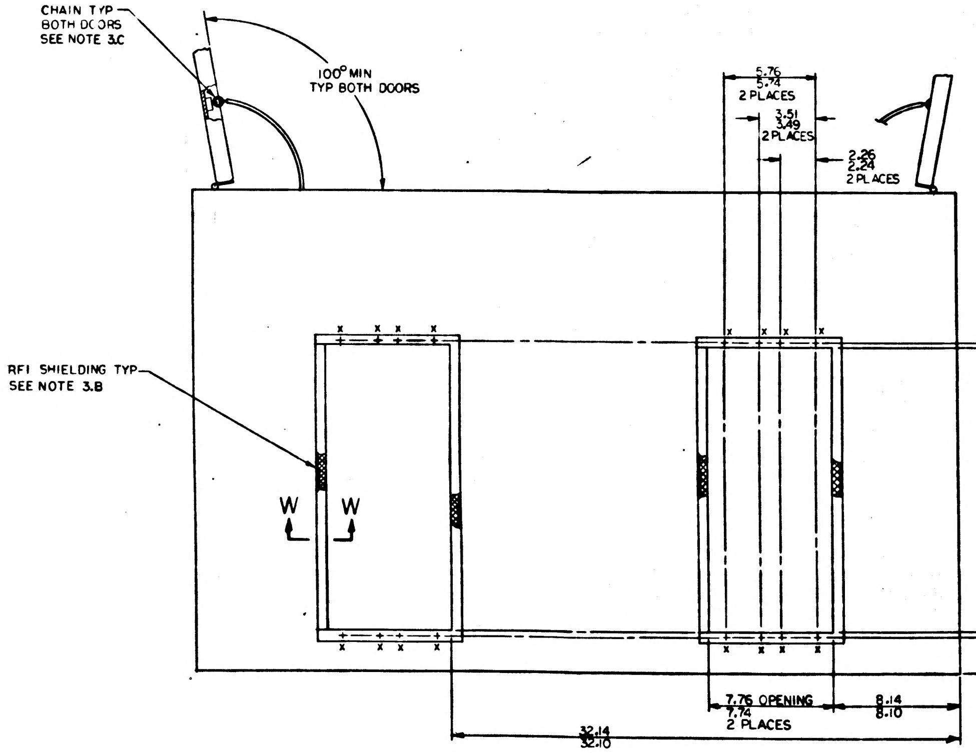


.213 .223 DIA 6 HOLES MARKED XX
.375
57.225
SEE DETAIL AA SHEET 4
METALLIZED OR TINNED SURFACE AROUND CUTOUT TO BE .40 .50 TYP
53.135
49.045
44.955
40.865
38.252
36.775
32.685
56.82 56.80
58.31 58.29
COVER ASSY SEE DETAIL V
28.595
24.505
TAP NO. 8 (.164)-32UNC-2B THRU FLANGE 32 HOLES MARKED Z
20.415
18.990
16.325
2.32 2.30
12.235
.51 .49
BOTTOM OF DOOR OPENING REF
8.145
2.690 TYP
.190 TYP
4.055
1.655
RFI SHIELDING TYP SEE NOTE 3.B
.200
.338
THREADED STUD .375-16UNC-2A X 3.06 2.94 LG
0 BASIC
.40 .42
.375
7.00 6.99 4 PLACES
1.000 2 PLACES
2.000 2 PLACES
WELD
8.91 8.86 2 PLACES
.95 .93
1.03 .99
12.03 12.00 2 PLACES
OPENING
.19 .18 2 PLACES
17.95 17.92 2 PLACES
.63 .60 2 PLACES
18.32 18.30 2 PLACES
19.18 19.15 2 PLACES
OPENING
.375-16UNC-2B TAPPED THRU
CABINET GROUND CONNECTION

VIEW G-G
SHEET 1



SECTION W-W
REINFORCING TYP AROUND BOTH OPENINGS



CHAIN TYP BOTH DOORS SEE NOTE 3.C
100° MIN TYP BOTH DOORS
5.76 5.74 2 PLACES
3.51 3.49 2 PLACES
2.26 2.24 2 PLACES
RFI SHIELDING TYP SEE NOTE 3.B
W W
18.32 18.31
17.76 17.74
.29 .27
2.04 1.96
7.76 7.74 OPENING 2 PLACES
8.14 8.10
32.14 32.10

VIEW H-H
SHEET 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN [illegible] DATE 22 JUN65
CHECKED C. I. English 14 SEP 65
APPROVAL [illegible] 9/13/65
APPROVAL D. O. Bryant 9/14/65
APPROVAL [illegible] 9/10/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423
SCALE NONE	WT	SHEET 2 OF 4

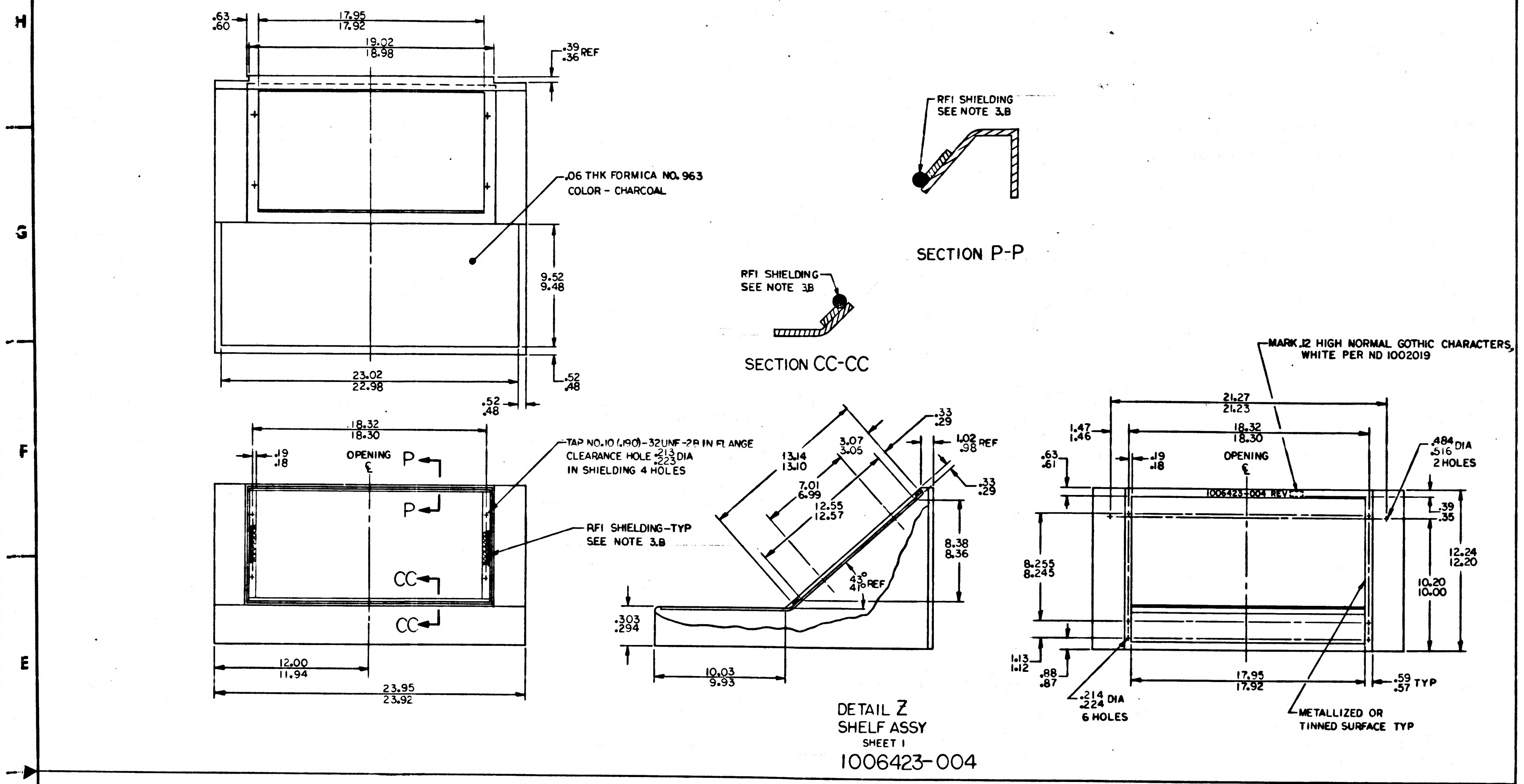
1006423 -

MASTER

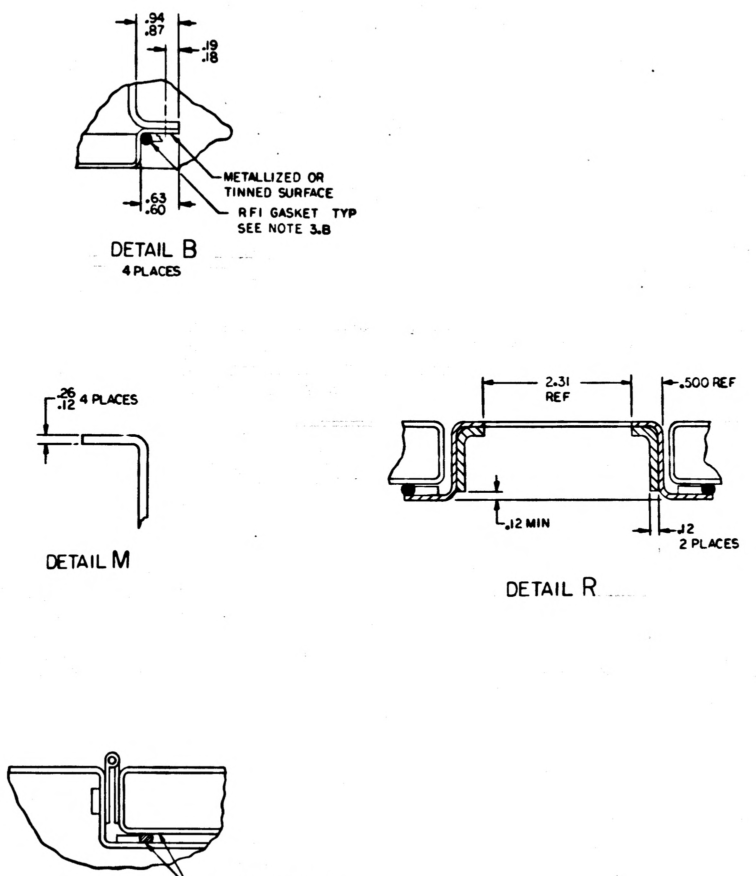
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

–	1006423

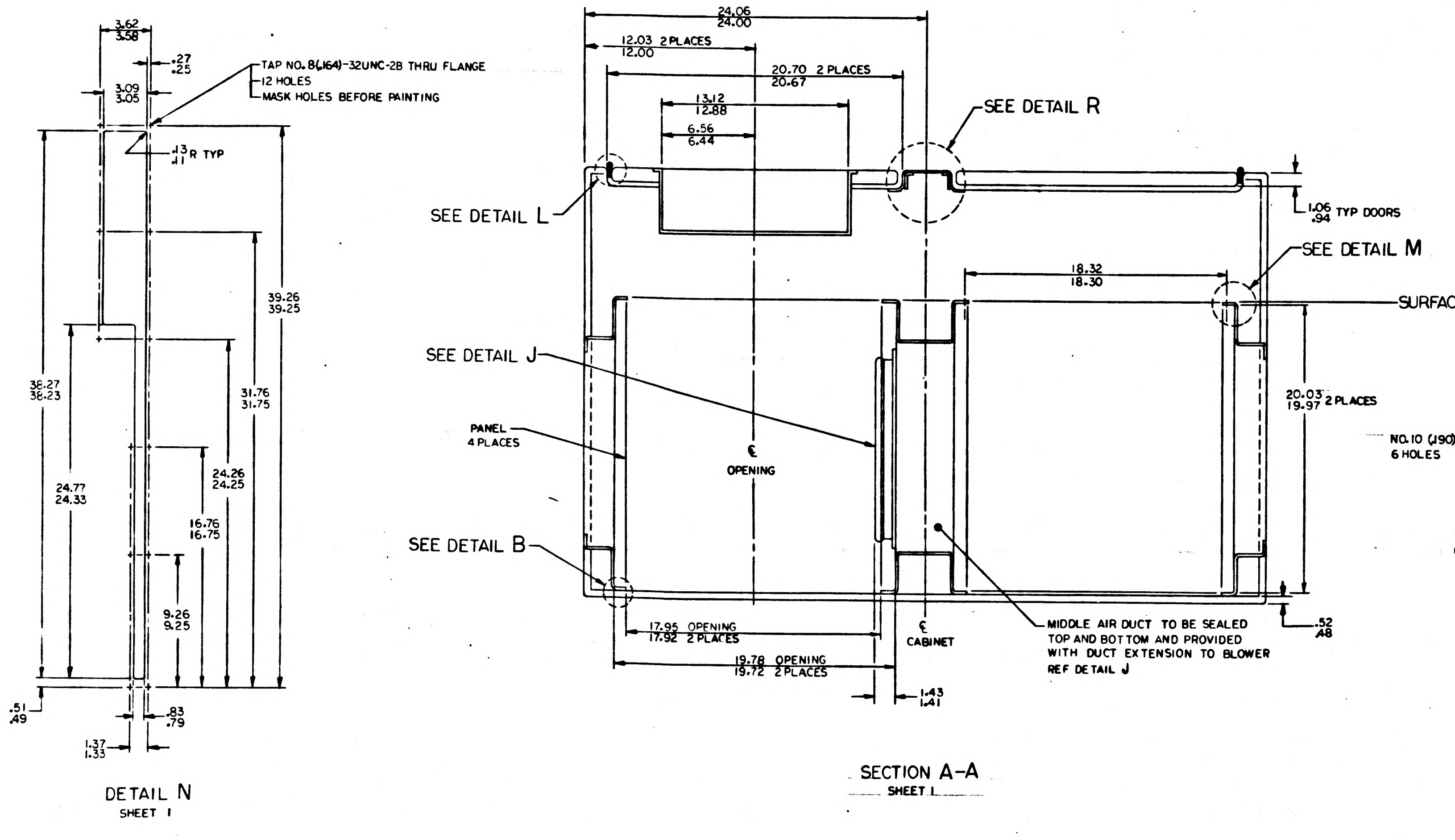
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25188	9/17/65	J Haran
1	REVISED PER CCA R25323 DR CHK APPD		
2	CHANGE PER CCA R25474 DR W. Kelly CHK APPD		
–	RELEASED CLASS A PER TDRR 24524		



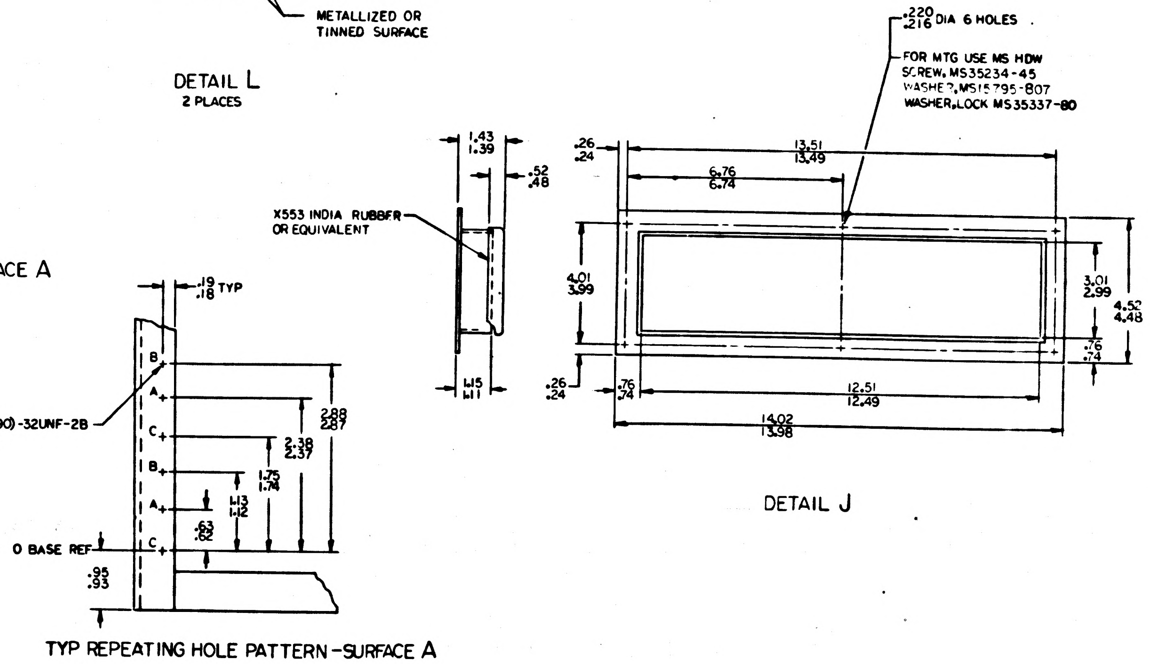
.06 THK FORMICA NO. 963
COLOR - CHARCOAL
RFI SHIELDING
SEE NOTE 3.B
SECTION P-P
RFI SHIELDING
SEE NOTE 3.B
SECTION CC-CC
TAP NO.10 (.190)-32UNF-2B IN FLANGE
CLEARANCE HOLE .213/.223 DIA
IN SHIELDING 4 HOLES
RFI SHIELDING-TYP
SEE NOTE 3.B
OPENING
P
CC
MARK .12 HIGH NORMAL GOTHIC CHARACTERS,
WHITE PER ND 1002019
1006423-004 REV
.484/.516 DIA
2 HOLES
.214/.224 DIA
6 HOLES
METALLIZED OR
TINNED SURFACE TYP
43° 41° REF
DETAIL Z
SHELF ASSY
SHEET 1
1006423-004



METALLIZED OR
TINNED SURFACE
RFI GASKET TYP
SEE NOTE 3.B
DETAIL B
4 PLACES
.26/.12 4 PLACES
DETAIL M
2.31 REF
.500 REF
.12 MIN
.12
2 PLACES
DETAIL R
METALLIZED OR
TINNED SURFACE



TAP NO. 8 (.164)-32UNC-2B THRU FLANGE
12 HOLES
MASK HOLES BEFORE PAINTING
.13/.11 R TYP
DETAIL N
SHEET 1
SEE DETAIL R
SEE DETAIL L
SEE DETAIL M
SEE DETAIL J
SEE DETAIL B
SURFACE A
1.06/.94 TYP DOORS
PANEL
4 PLACES
OPENING
CABINET
17.95/17.92 OPENING 2 PLACES
19.78/19.72 OPENING 2 PLACES
20.03/19.97 2 PLACES
MIDDLE AIR DUCT TO BE SEALED
TOP AND BOTTOM AND PROVIDED
WITH DUCT EXTENSION TO BLOWER
REF DETAIL J
SECTION A-A
SHEET 1



DETAIL L
2 PLACES
.220/.216 DIA 6 HOLES
FOR MTG USE MS HDW
SCREW, MS35234-45
WASHER, MS15795-807
WASHER, LOCK MS35337-80
X553 INDIA RUBBER
OR EQUIVALENT
DETAIL J
.19/.18 TYP
NO.10 (.190)-32UNF-2B
6 HOLES
0 BASE REF
TYP REPEATING HOLE PATTERN-SURFACE A

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE 22 JUN 65
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

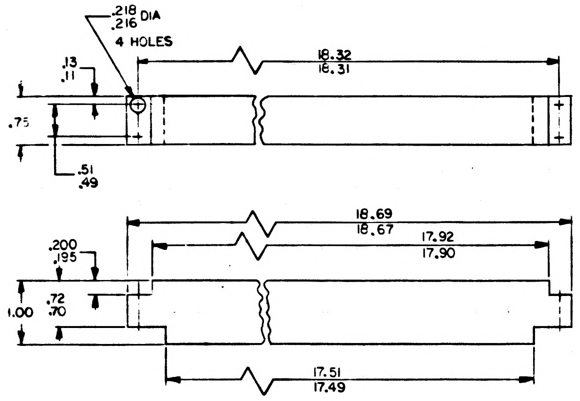
CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423
SCALE NONE	WT	SHEET 3 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006423	–

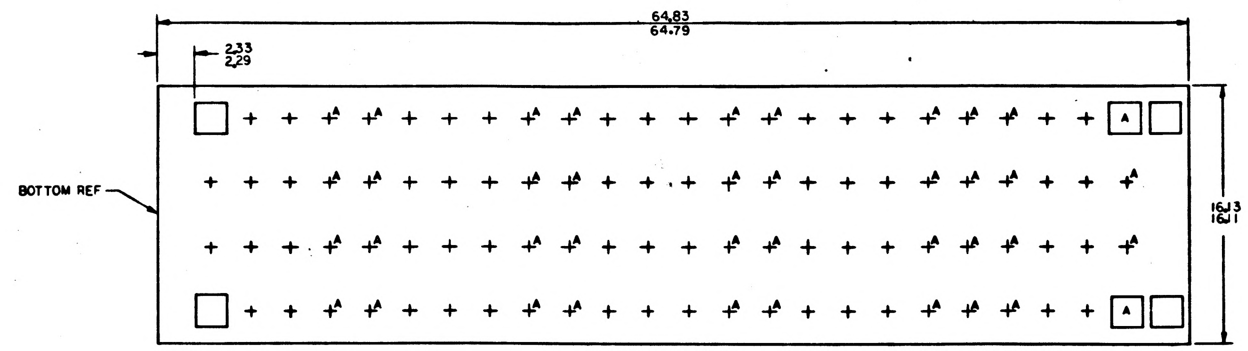
1006423 -

SYM	DESCRIPTION	DATE	APPROVED
REVISIONS			
0	RELEASED PER CCA R25.88		O. Harano
1	REVISED PER CCA R25323 DR J. Doty CHK APPD	11-2-65	
2	CHANGE PER CCA R25474 DR W. Kelly CHK APPD	11/4/65	
—	RELEASED CLASS A PER TDRR 24524		



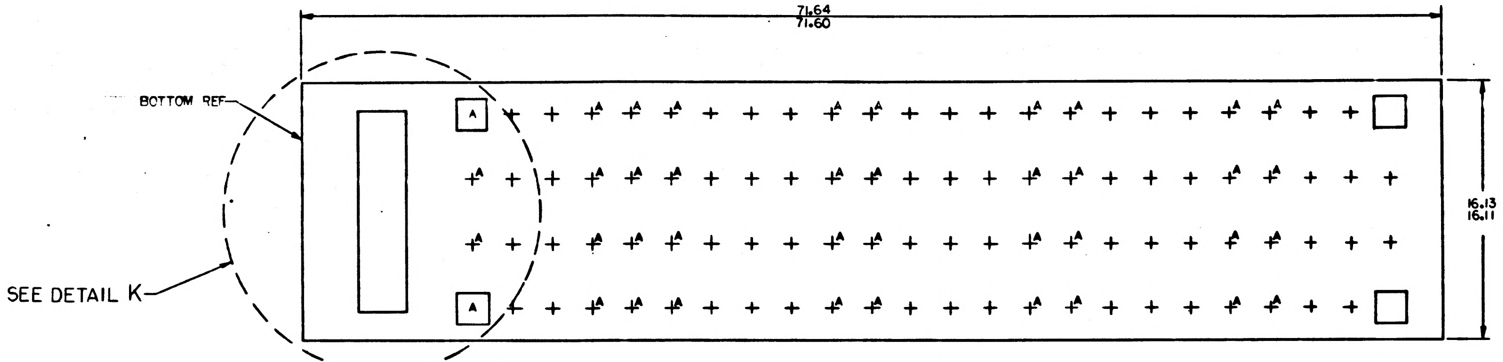
.218 .216 DIA 4 HOLES
.13 .11
18.32 18.31
.75
.51 .49
18.69 18.67
17.92 17.90
.200 .195
1.00
.72 .70
17.51 17.49

DETAIL BB
CROSSBAR
13 PLACES
SHEET 1



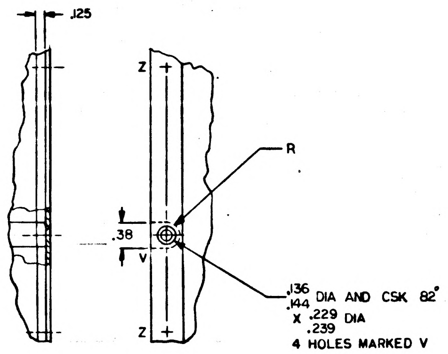
64.83 64.79
2.33 2.29
BOTTOM REF
16.13 16.11
A

VIEW C-C
SHEET 1
SHOWN ROTATED 90° CW



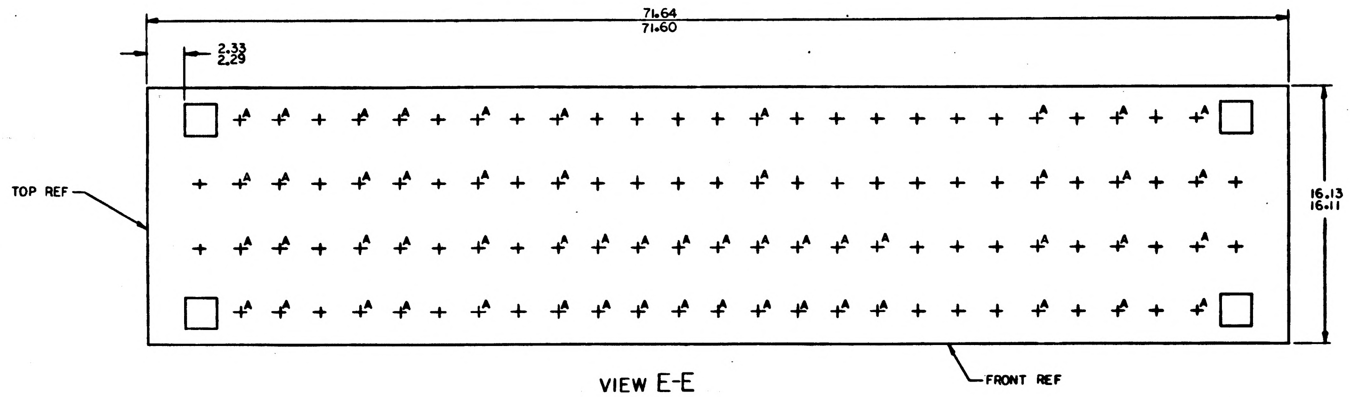
71.64 71.60
BOTTOM REF
SEE DETAIL K
16.13 16.11
A

VIEW D-D
SHEET 1
SHOWN ROTATED 90° CW



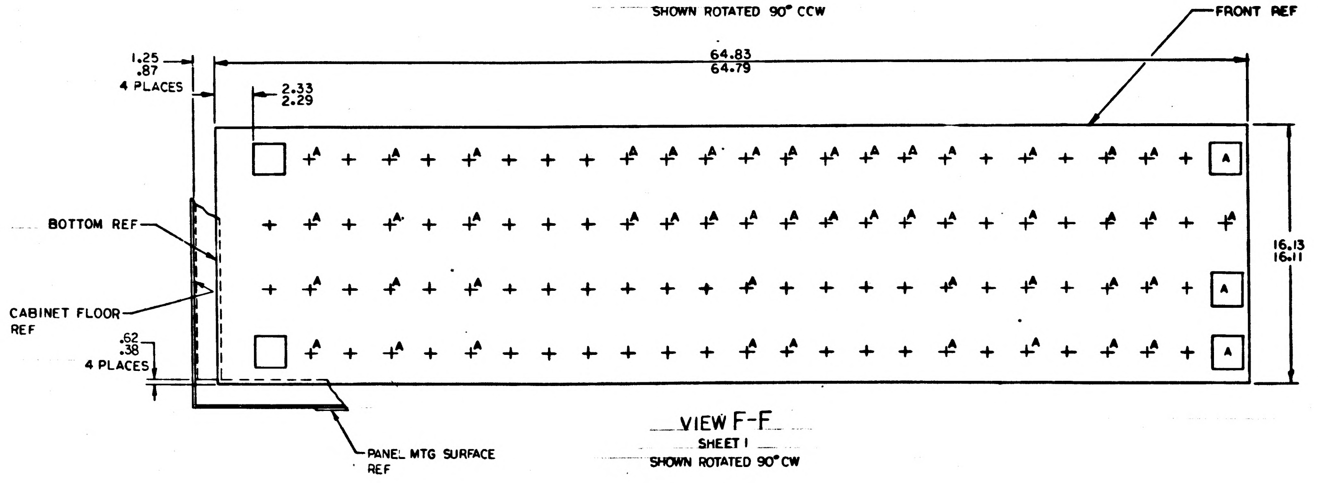
.125
Z
R
.38
V
.136 .144 DIA AND CSK 82° X .229 .239 DIA 4 HOLES MARKED V

DETAIL AA
2 PLACES



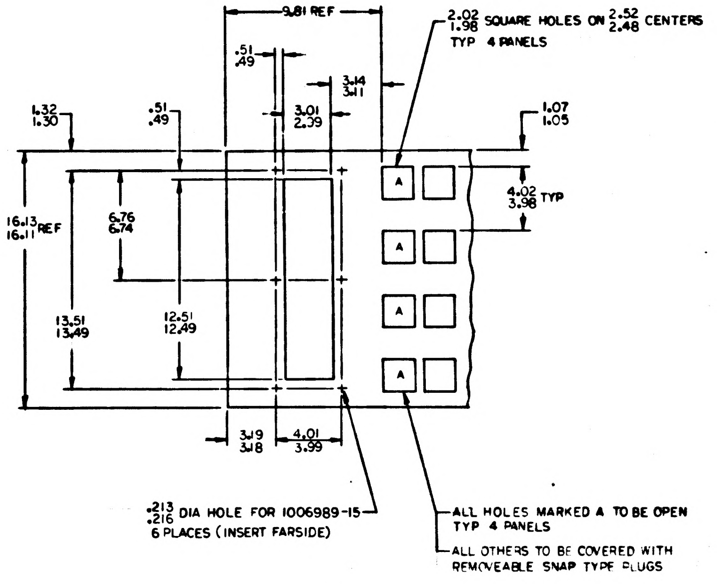
71.64 71.60
2.33 2.29
TOP REF
16.13 16.11
FRONT REF
A

VIEW E-E
SHEET 1
SHOWN ROTATED 90° CCW



FRONT REF
1.25 .87 4 PLACES
64.83 64.79
2.33 2.29
BOTTOM REF
CABINET FLOOR REF
.62 .38 4 PLACES
16.13 16.11
PANEL MTG SURFACE REF
A

VIEW F-F
SHEET 1
SHOWN ROTATED 90° CW



9.81 REF
2.02 1.98 SQUARE HOLES ON 2.52 2.48 CENTERS TYP 4 PANELS
.51 .49
3.14 3.11
3.01 2.99
1.32 1.30
.51 .49
1.07 1.05
4.02 3.98 TYP
16.13 16.11 REF
6.76 6.74
13.51 13.49
12.51 12.49
3.19 3.18
4.01 3.99
.213 .216 DIA HOLE FOR 1006989-15 6 PLACES (INSERT FARSIDE)
ALL HOLES MARKED A TO BE OPEN TYP 4 PANELS
ALL OTHERS TO BE COVERED WITH REMOVEABLE SNAP TYPE PLUGS
A

DETAIL K
SCALE NONE

1006423 -

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE 22 JUN65
CHECKED B K English 14 SEP 65
APPROVAL
APPROVAL D. O'Bryant 9/14/65
APPROVAL 9/17/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	J	1006423
SCALE NONE	WT	SHEET 4 OF 4

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	1006426

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25312	10/14/65	A. Haran
1	REVISED PER CCA R25537 DR H. Wong CHK E. Urban APPD MB 11-20	26 Nov 65	S.F.S.
—	CLASS A RELEASED PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:
   - A. PARTS SHALL MEET THE REQUIREMENTS OF MIL-F-5591 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - C. MARKING: PARTS SHALL BE IDENTIFIED IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

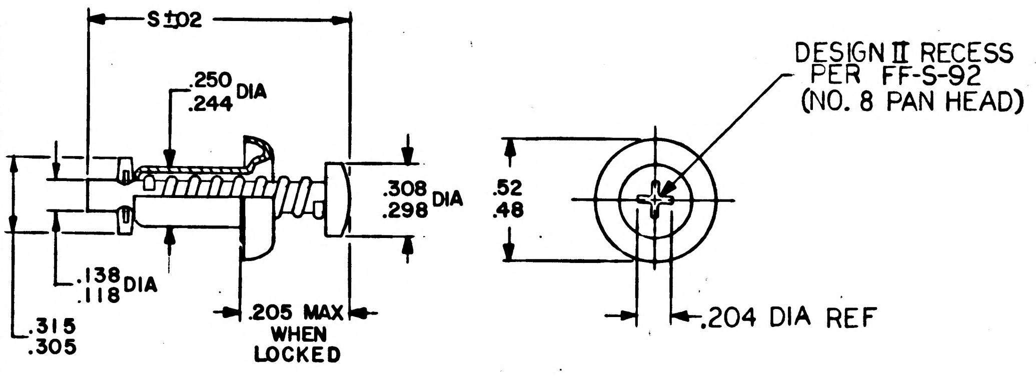
2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.C. AND 1.D.
   - B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:
   - A. CONSTRUCTION: CROSS-RECESSED PAN-HEAD STUD CAPTIVATED WITHIN A PANEL BUSHING AND SPRING LOADED TO ASSURE WITHDRAWAL FROM A STANDARD RECEPTACLE. TENSILE RATING SHALL BE 200 POUNDS MINIMUM.
   - B. MATERIAL:
     - (1) STUD: ALLOY STEEL (AISI-C4037)
     - (2) BUSHING: LOW CARBON STEEL (AISI-1009)
     - (3) SPRING AND CROSS PIN: MUSIC WIRE
   - C. FINISH:
     - (1) STUD AND BUSHING: NICKEL PLATE PER QQ-N-290, CLASS 1, TYPE II.
     - (2) SPRING AND CROSS PIN: CADMIUM PLATE PER QQ-P-416, CLASS 2, TYPE II.
   - D. ACCESSORY PARTS (NOT SUPPLIED):
     - (1) RETAINING WASHERS:
       SPLIT WASHER (TO RETAIN STUDS FOR GRIP LENGTHS GREATER THAN .150) NASA PART NO. 1006994.
     - (2) RECEPTACLE: NASA PART NO. 1006993.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED ON CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

DASH NO.	"S" DIM.	GRIP RANGE
001	.76	.030-.059
002	.79	.060-.089
003	.82	.090-.119
004	.85	.120-.149
005	.88	.150-.179
006	.91	.180-.209
007	.94	.210-.239
008	.97	.240-.269
009	1.00	.270-.299
010	1.03	.300-.329
011	1.06	.330-.359
012	1.09	.360-.389
013	1.12	.390-.419
014	1.15	.420-.449
015	1.18	.450-.479
016	1.21	.480-.509
017	1.24	.510-.539
018	1.27	.540-.569
019	1.30	.570-.599
020	1.33	.600-.629
021	1.36	.630-.659
022	1.39	.660-.689
023	1.42	.690-.719
024	1.45	.720-.749
025	1.48	.750-.779
026	1.51	.780-.809
027	1.54	.810-.839
028	1.57	.840-.869
029	1.60	.870-.899
030	1.63	.900-.929
031	1.66	.930-.959
032	1.69	.960-.989
033	1.72	.990-1.019
034	1.75	1.020-1.049
035	1.78	1.050-1.079
036	1.81	1.080-1.109
037	1.84	1.110-1.139
038	1.87	1.140-1.169
039	1.90	1.170-1.199
040	1.93	1.200-1.229
041	1.96	1.230-1.259
042	1.99	1.260-1.289
043	2.02	1.290-1.319
044	2.05	1.320-1.349
045	2.08	1.350-1.379
046	2.11	1.380-1.409
047	2.14	1.410-1.439
048	2.17	1.440-1.469
049	2.20	1.470-1.499
050	2.23	1.500-1.529



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±
DECIMALS .xxx ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN Jim Doty DATE 30 SEP 65
CHECKED A. Kinkor 8 OCT 65
APPROVAL 12 Oct 65
APPROVAL D. O'Bryant 10/12/65
APPROVAL 10/15/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Haran 12/14/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

STUD ASSEMBLY, TURNLOCK FASTENER

SPECIFICATION CONTROL DRAWING

SIZE	CODE IDENT NO.	NASA DRAWING NO.
C	49956	1006426

SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 02089

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1006428 A

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25343	10/22/65	A Barano
—	RELEASED CLASS A PER TDRR 24524		
A	CHANGED PER TDRR 25918 DR Tom Kielson CHK B Jensen APPD	2/17/65	

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   B. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING):

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.

      (3) SWITCH ACTION: SWITCHES SHALL HAVE A DEFINITE DETENT ACTION IN EACH OF 12 POSITIONS. FORCE REQUIRED TO SWITCH SHALL BE 7-11 OUNCES AT THE THUMBWHEEL.

      (4) DIAL MARKING: SEQUENTIAL MARKING, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, ON EACH SWITCH.

   B. ELECTRICAL CHARACTERISTICS:

      (1) SWITCH MODULE CONNECTION: ONE POLE, 12 POSITION, NON-SHORTING.

      (2) INSULATION RESISTANCE: 500 MEGOHMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

      (3) DIELECTRIC WITHSTANDING VOLTAGE: 1250 VOLTS RMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

      (4) CONTACT RESISTANCE: 100 MILLIOHMS WITH A CURRENT OF 10 MILLIAMPERES FLOWING.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

   A. CONTACT RATINGS:

      (1) VOLTAGE: 200 VOLTS DC.

      (2) CURRENT: 3.0 AMPERES DC NON SWITCHING
      12 WATTS NON-INDUCTIVE SWITCHING

   B. OPERATING LIFE: 100,000 CYCLES MINIMUM AT NO LOAD AND 25,000 CYCLES MINIMUM UNDER A 12 WATT NON-INDUCTIVE LOAD. A CYCLE IS DEFINED AS ONE COMPLETE ROTATION; ROTATIONAL TORQUE SHALL CHANGE LESS THAN ±25 % AFTER LIFE TEST.

   C. CONSTRUCTION:

      (1) PLASTIC PARTS: THE SWITCH BODIES, THUMBWHEELS, END BRACKETS, AND SPACERS SHALL BE GREY POLYCARBONATE PLASTIC. NUMERALS ON THE THUMBWHEELS SHALL BE HOT-STAMPED BLACK NUMERALS (.235 HIGH BY .156 WIDE).

      (2) CIRCUIT BOARD: .062 EPOXY GLASS PER MIL-P-13949, TYPE GE.

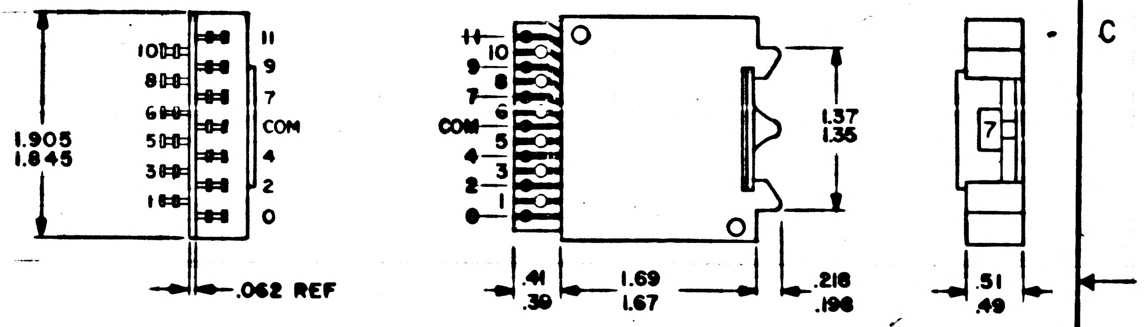
      (3) ASSEMBLIES: SWITCHES, SPACERS, AND END BRACKETS SHALL NEST TOGETHER WITH TABS AND RECESSES TO PREVENT ROTATION AND SHALL BE SECURED TOGETHER WITH POST SPACERS AND SCREWS. SCREWS SHALL BE REMOVABLE FOR REPLACEMENT OF PARTS. TERMINALS SHALL BE PRECISION METAL PRODUCTS CO. PART NO. 1D3-8B OR EQUIVALENT.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR'S LIST.

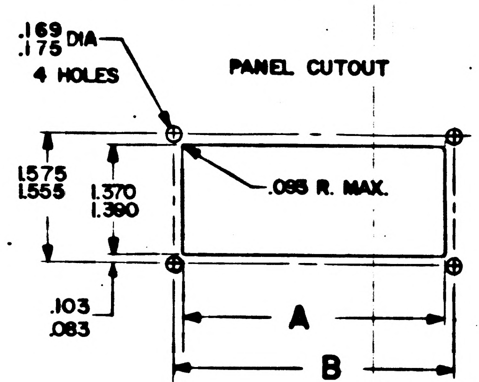
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

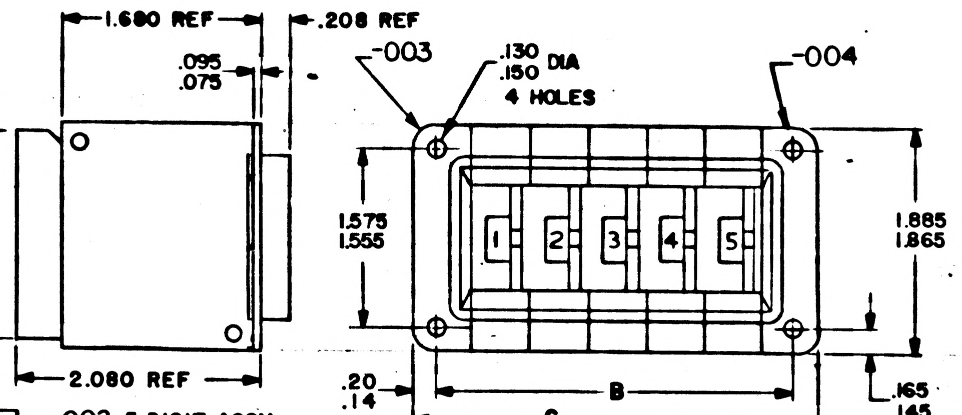
DASH NO.	DESCRIPTION
-001	SWITCH MODULE
-002	ASSEMBLY, 5 DIGIT
-003	LEFT HAND END CAP
-004	RIGHT HAND END CAP

-001 SWITCH MODULE



PANEL CUTOUT





-002 5 DIGIT ASSY

DASH NO.	A	B	C
-002	2.880 2.900	3.085 3.065	3.44 3.38

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497

DRAWN J. Botsford DATE Mar 66
CHECKED
APPROVAL 10/15/65
APPROVAL D. O. Bryant 10/15/65
APPROVAL 10/15/65
NASA APPROVAL A. C. Metzger
W Kupfer 7 Dec 65
MIT APPROVAL A Barano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, THUMBWHEEL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006428
SCALE NONE
WT
SHEET 1 OF 1

1006428 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006428 | B

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25343	10/22/65	A Harano
—	RELEASED CLASS A PER TDRR 24524		
A	CHANGED PER TDRR 25918 DR Tom Nielson CHK B Jensen APPD H Maynard	2/17/65	
B	REVISED PER TDRR 26234 DR J.P. Leonard CHK R. Edwards APPD H Maynard		

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

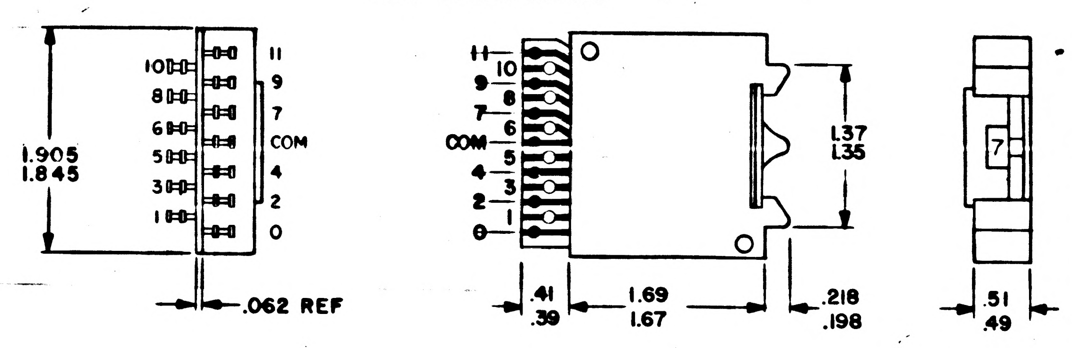
2. ACCEPTANCE AND INSPECTION (SAMPLING):
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.
     - (3) SWITCH ACTION: SWITCHES SHALL HAVE A DEFINITE DETENT ACTION IN EACH OF 12 POSITIONS. FORCE REQUIRED TO SWITCH SHALL BE 7-11 OUNCES AT THE THUMBWHEEL.
     - (4) DIAL MARKING: SEQUENTIAL MARKING, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, ON EACH SWITCH.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) SWITCH MODULE CONNECTION: ONE POLE, 12 POSITION, NON-SHORTING.
     - (2) INSULATION RESISTANCE: 500 MEGOHMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.
     - (4) CONTACT RESISTANCE: 100 MILLIOHMS WITH A CURRENT OF 10 MILLIAMPERES FLOWING.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:
   - A. CONTACT RATINGS:
     - (1) VOLTAGE: 200 VOLTS DC.
     - (2) CURRENT: 3.0 AMPERES DC NON SWITCHING
12 WATTS NON-INDUCTIVE SWITCHING
   - B. OPERATING LIFE: 100,000 CYCLES MINIMUM AT NO LOAD AND 25,000 CYCLES MINIMUM UNDER A 12 WATT NON-INDUCTIVE LOAD. A CYCLE IS DEFINED AS ONE COMPLETE ROTATION. ROTATIONAL TORQUE SHALL CHANGE LESS THAN ±25 % AFTER LIFE TEST.
   - C. CONSTRUCTION:
     - (1) PLASTIC PARTS: THE SWITCH BODIES, THUMBWHEELS, END BRACKETS, AND SPACERS SHALL BE GREY POLYCARBONATE PLASTIC. NUMERALS ON THE THUMBWHEELS SHALL BE HOT-STAMPED BLACK NUMERALS (.235 HIGH BY .156 WIDE).
     - (2) CIRCUIT BOARD: .062 EPOXY GLASS PER MIL-P-13949, TYPE GE.
     - (3) ASSEMBLIES: SWITCHES, SPACERS, AND END BRACKETS SHALL NEST TOGETHER WITH TABS AND RECESSES TO PREVENT ROTATION AND SHALL BE SECURED TOGETHER WITH POST SPACERS AND SCREWS. SCREWS SHALL BE REMOVABLE FOR REPLACEMENT OF PARTS. TERMINALS SHALL BE PRECISION METAL PRODUCTS CO. PART NO. 1D3-8B OR EQUIVALENT.

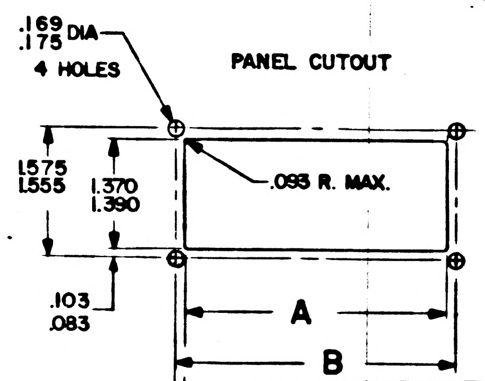
PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR'S LIST.

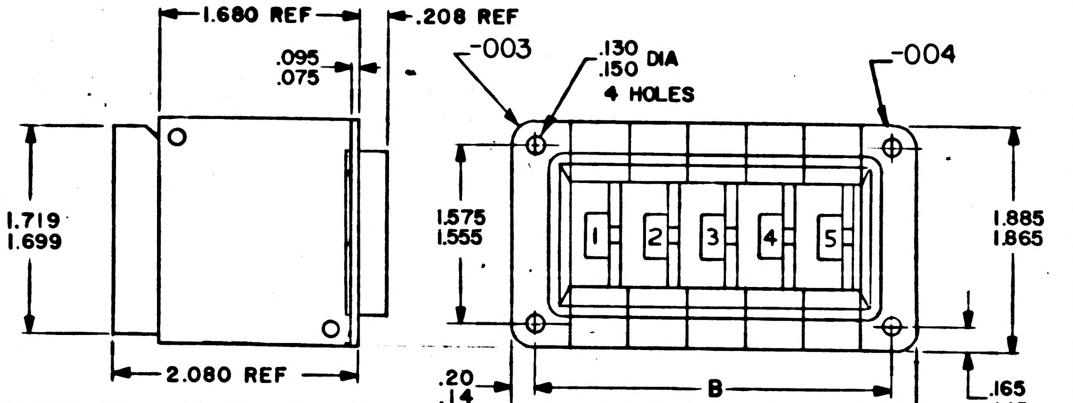
DASH NO.	DESCRIPTION
-001	SWITCH MODULE
-002	ASSEMBLY, 5 DIGIT
-003	LEFT HAND END CAP
-004	RIGHT HAND END CAP

-001 SWITCH MODULE



PANEL CUTOUT





-002 5 DIGIT ASSY

DASH NO.	A	B	C
-002	2.880 2.900	3.085 3.065	3.44 3.38

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497

DRAWN J Botz DATE 12 Aug 65
CHECKED 27 Sep 65
APPROVAL 10/15/65
APPROVAL D. A. Bryant 10/15/65
APPROVAL 10/22/65
NASA APPROVAL
W Kupfer 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, THUMBWHEEL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006428
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006428 B

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— 1006428

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25343	10/22/65	A.Alvarano
—	RELEASED CLASS A PER TDRR 29524		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

B. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING):

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.

(3) SWITCH ACTION: SWITCHES SHALL HAVE A DEFINITE DETENT ACTION IN EACH OF 12 POSITIONS. FORCE REQUIRED TO SWITCH SHALL BE 7-11 OUNCES AT THE THUMBWHEEL.

(4) DIAL MARKING: SEQUENTIAL MARKING, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, ON EACH SWITCH.

B. ELECTRICAL CHARACTERISTICS:

(1) SWITCH MODULE CONNECTION: ONE POLE, 12 POSITION, NON-SHORTING.

(2) INSULATION RESISTANCE: 500 MEGOHMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

(3) DIELECTRIC WITHSTANDING VOLTAGE: 1250 VOLTS RMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

(4) CONTACT RESISTANCE: 100 MILLIOHMS WITH A CURRENT OF 10 MILLIAMPERES FLOWING.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

A. CONTACT RATINGS:

(1) VOLTAGE: 200 VOLTS DC.

(2) CURRENT: 3.0 AMPERES DC NON SWITCHING
12 WATTS NON-INDUCTIVE SWITCHING

B. OPERATING LIFE: 100,000 CYCLES MINIMUM AT NO LOAD AND 25,000 CYCLES MINIMUM UNDER A 12 WATT NON-INDUCTIVE LOAD. A CYCLE IS DEFINED AS ONE COMPLETE ROTATION: ROTATIONAL TORQUE SHALL CHANGE LESS THAN ±25 % AFTER LIFE TEST.

C. CONSTRUCTION:

(1) PLASTIC PARTS: THE SWITCH BODIES, THUMBWHEELS, END BRACKETS, AND SPACERS SHALL BE GREY POLYCARBONATE PLASTIC. NUMERALS ON THE THUMBWHEELS SHALL BE HOT-STAMPED BLACK NUMERALS (.235 HIGH BY .156 WIDE).

(2) CIRCUIT BOARD: .062 EPOXY GLASS PER MIL-P-13949, TYPE GE.

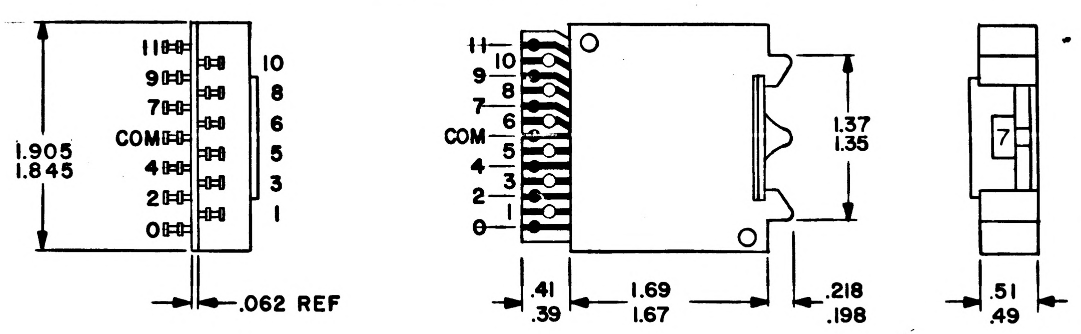
(3) ASSEMBLIES: SWITCHES, SPACERS, AND END BRACKETS SHALL NEST TOGETHER WITH TABS AND RECESSES TO PREVENT ROTATION AND SHALL BE SECURED TOGETHER WITH POST SPACERS AND SCREWS. SCREWS SHALL BE REMOVABLE FOR REPLACEMENT OF PARTS. TERMINALS SHALL BE PRECISION METAL PRODUCTS CO. PART NO. 1D3-8B OR EQUIVALENT.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR'S LIST.

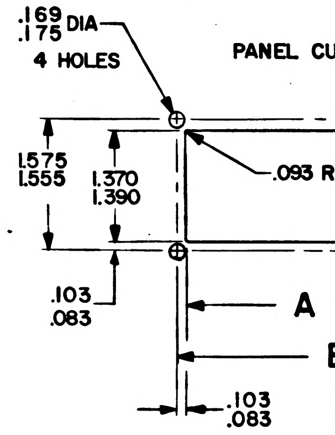
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

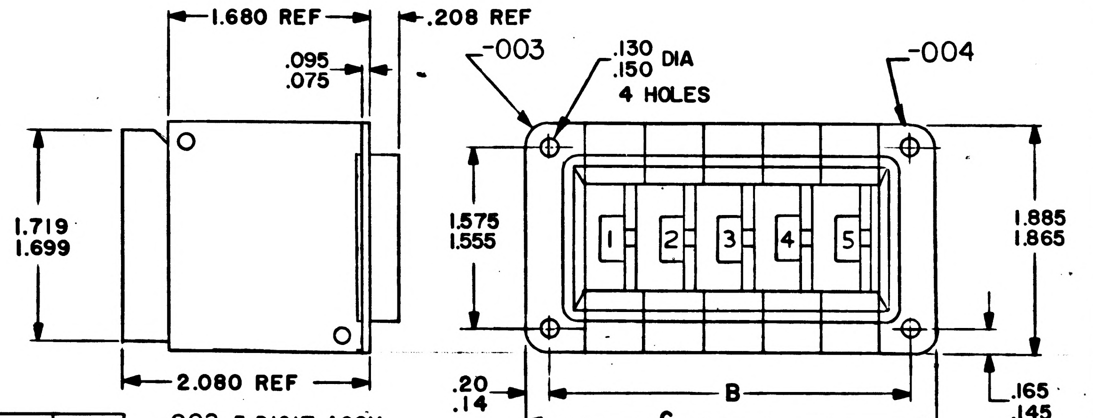
DASH NO.	DESCRIPTION
-001	SWITCH MODULE
-002	ASSEMBLY, 5 DIGIT
-003	LEFT HAND END CAP
-004	RIGHT HAND END CAP

-001 SWITCH MODULE



PANEL CUTOUT





-002 5 DIGIT ASSY

DASH NO.	A	B	C
-002	2.880 2.900	3.085 3.065	3.44 3.38

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497

DRAWN J. Doty DATE 12 Aug 66
CHECKED C. Kulis 29 Sep 65
APPROVAL [illegible] 10/15/65
APPROVAL D. O. Bryant 10/15/65
APPROVAL [illegible] 10/14/65
NASA APPROVAL A. C. [illegible]
W Kappler 7 Dec 65
MIT APPROVAL A. Alvarano 12/4/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, THUMBWHEEL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006428
SCALE NONE
WT
SHEET 1 OF 1

1006428

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER: AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

– 1006429

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25170	9/14/65	
–	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   B. PART MARKING: UNITS SHALL BE MARKED (TAGGING IS PERMISSIBLE), IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 7.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLING

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.

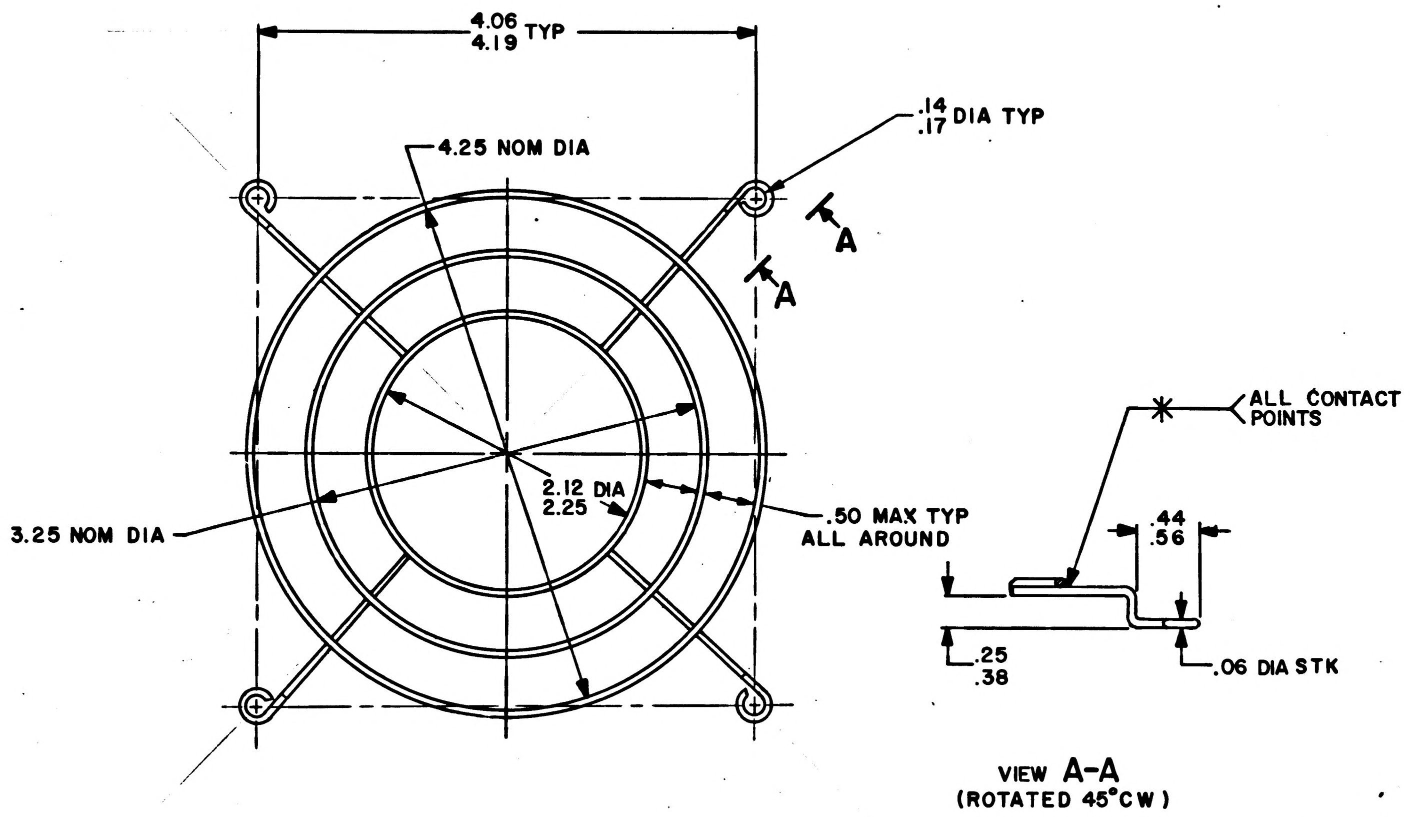
   B. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

   A. MATERIAL: ALUMINUM ALLOY ROUND WIRE.

   B. CONSTRUCTION: RESISTANCE WELDED AT ALL CONTACT POINTS. BUTT AND/OR SCARF WELDS SHALL HAVE NO BURRS OR SHARP EDGES.



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS9-497
DRAWN J. Doty DATE 17 Aug 65
CHECKED J. Han 28 AUG 65
APPROVAL 9/10/65 H. White 11/24/65
APPROVAL D. O'Connor 9/10/65
APPROVAL M. J. Barry 9/14/65
NASA APPROVAL A. C.
W. Kopfer 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GRILLE, METAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006429
SCALE NONE
WT
SHEET 1 OF 1

1006429

1006442 —

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25567		
—	CLASS A RELEASE PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

A. BRAIDED WIRE FURNISHED UNDER THIS DRAWING SHALL MEET THE GENERAL REQUIREMENTS OF FEDERAL SPECIFICATION QQ-B-575 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

C. MARKING: SPOOLS OR REELS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, QUANTITY CONTAINED, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 8.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. VISUAL AND MECHANICAL:

(1) CONSTRUCTION: WIRE BRAID SHALL BE WOVEN AND SHALL HAVE THE NUMBER OF CARRIERS AND ENDS SPECIFIED IN TABLE I FOR THE APPROPRIATE SIZE OF BRAID AND WIRE.

(2) FORM: FINISHED BRAID SHALL BE ROLLED FLAT TO THE NOMINAL DIMENSIONS SHOWN IN TABLE I.

3. DESIGN:

A. APPLICATION: THIS BRAID IS INTENDED FOR USE AS A GROUNDING STRAP.

TABLE I

DASH NO.	NOMINAL DIMENSIONS - ROLLED FLAT		BRAID			EQUIV WIRE SIZE AWG
	WIDTH	THICKNESS	WIRE SIZE AWG	NUMBER OF CARRIERS	TOTAL NO. OF ENDS	
-001	1.0	.045	36	48	832	7
-002	1.5	.060	30	48	528	3
-003	2.0	.120	30	48	1536	000

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN N. Wong DATE 2 DEC 65
CHECKED 2 DEC 65
APPROVAL 2 Dec 65
APPROVAL D. O'Bryant 12/2/65
APPROVAL 12/3/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 2 Dec 65
MIT APPROVAL 12/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BRAID, WIRE, TINNED COPPER
SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 49956
NASA DRAWING NO. 1006442
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 02089

—	1006444

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 27341		

REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-T-27, TYPE TF4RX17YY WITH THE ADDITIONAL REQUIREMENTS SPECIFIED HEREIN.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - C. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, NASA PART NUMBER (DRAWING NUMBER), REVISION LETTER, SCHEMATIC AND TERMINAL IDENTIFICATION AS SHOWN.
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE & INSPECTION: SAMPLE
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) TURNS RATIO: 1:1
     - (2) DIELECTRIC WITHSTANDING VOLTAGE: 500 VRMS MINIMUM.
     - (3) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:
   - A. OPERATING LIFE: 10,000 HOURS MINIMUM WHEN OPERATED WITHIN ELECTRICAL AND ENVIRONMENTAL RATINGS.
   - B. ELECTRICAL RATINGS:
     - (1) PRIMARY:
       - (a) IMPEDANCE: 500/125 OHMS (SPLIT WINDING).
       - (b) DC UNBALANCE: 20 MA MAXIMUM.
     - (2) SECONDARY:
       - (a) IMPEDANCE: 500/125 OHMS (SPLIT WINDING).
       - (b) DC UNBALANCE: ZERO MAXIMUM.
       - (c) DISSIPATION: 0.25 WATTS AT 100 CPS.
     - (3) FREQUENCY RESPONSE: ± 2 DB, 100 CPS TO 20 KC/S.
     - (4) WORKING VOLTAGE: 175 VOLTS PEAK
   - C. ENVIRONMENTAL:
     - (1) AMBIENT TEMPERATURE: 65°C MAXIMUM.
     - (2) CASE: HERMETICALLY SEALED
   - D. TERMINALS: EACH TERMINAL SHALL ACCEPT TWO NO. 20 AWG LEADS.
   - E. FINISH: LIGHT GREY PAINT, NO. 26307 PER FED-STD-595.

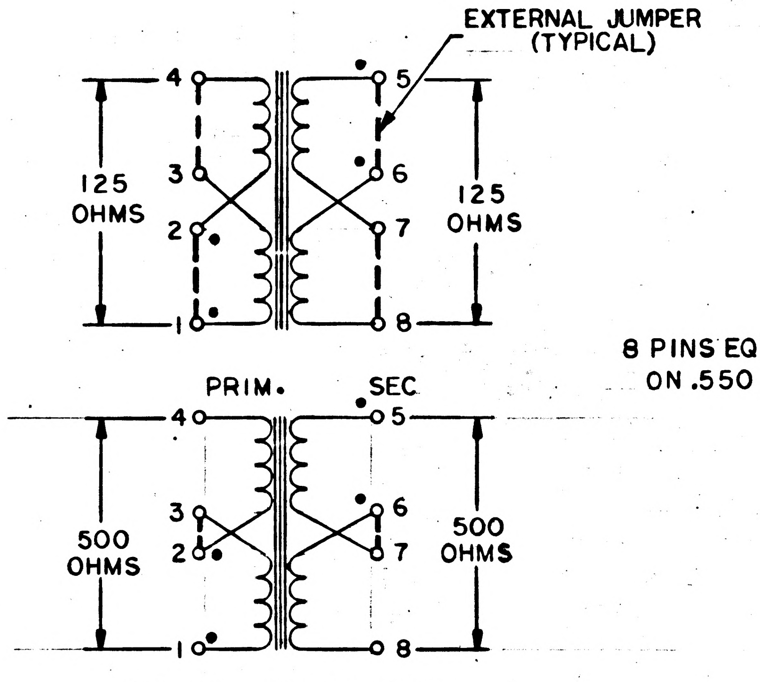
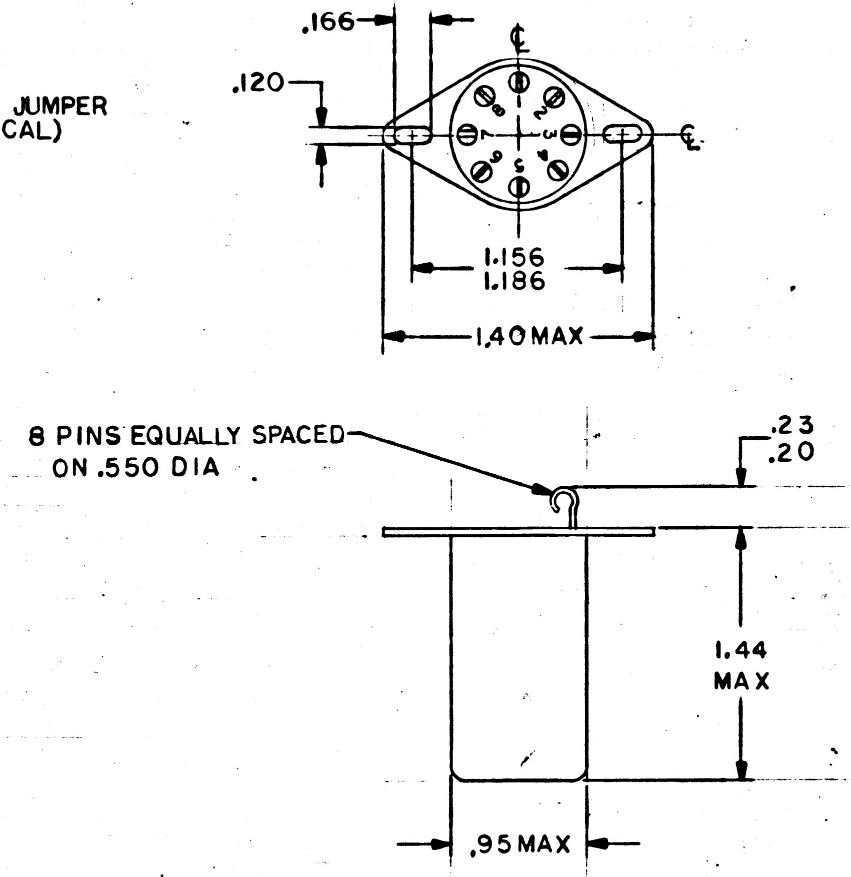


FIGURE I—SCHEMATIC



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN A. J. Buin DATE 30 DEC 65
CHECKED 30 DEC 65
APPROVAL P. Frazier 2/28/66
APPROVAL D. O. Bryant 2/28/66
APPROVAL 3/2/66
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Kupfer
MIT APPROVAL A. Harano 3/3/66

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER,
AUDIO FREQUENCY
SPECIFICATION CONTROL DRAWING

SIZE	CODE IDENT NO.	NASA DRAWING NO.
C	49956	1006444

SCALE NONE WT SHEET 1 OF 1

MODERN BLUE PRINT CO., INC. 02080

1006455 A

SYM	DESCRIPTION	DATE	APPROVED
—	CLASS A RELEASE PER TDRR 18388	21Apr65	WK
A	REVISED PER TDRR 22114 DR SJ Baran CHK H. Kuper APPD H. Maynard	17Jul65	878.

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

   B. MARKING: UNITS SHALL BE PERMANENTLY MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

   C. PREPARATION FOR DELIVERY: PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 7.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MARKING REQUIREMENTS AS SPECIFIED HEREIN.

   B. DIMENSIONS AS SPECIFIED.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      ~~(1) A CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF MIL-Q-9858.~~

      (2) A CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:

   A. CONSTRUCTION: THIS CAP SHALL HAVE A RETAINING DEVICE CONSISTING OF 4 BALLS PLACED 90° APART AND HELD IN PLACE BY A SPRING-LOADED COUPLING RING AS INDICATED IN OUTLINE.

   B. MATERIAL AND FINISH:

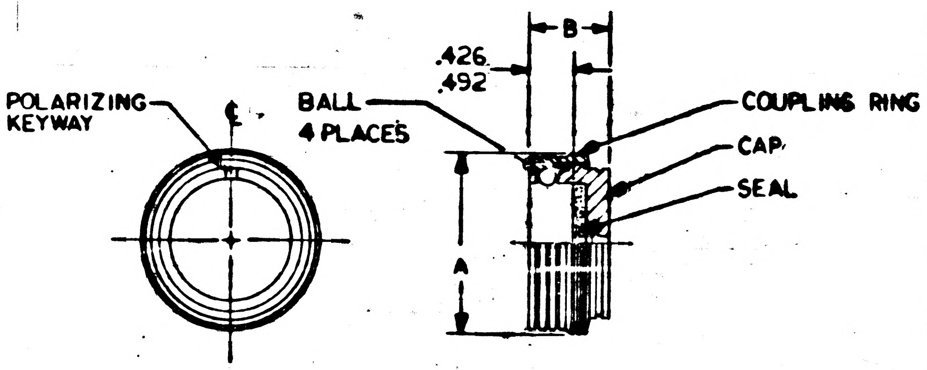
      (1) CAP AND COUPLING RING: ALUMINUM ALLOY AS REQUIRED BY MIL-C-26482. CADMIUM PLATED PER MIL-C-26482 WITH CLEAR CHROMATE FINISH.

      (2) BALLS: CORROSION-RESISTANT STEEL

      (3) SEAL: SILICONE RUBBER

   ~~C. THIS CAP MAY BE USED WITH CONNECTORS PER NASA DRAWING 1012151-013 THRU 016.~~

DASH NO.	DIMENSIONS A	DIMENSIONS B	CONN SHELL SIZE
001	.917 .887	.572 .542	7
002	.734 .704	.650 .620	3
003	1.077 1.047	.650 .620	12
004	1.212 1.182	.572 .542	19
005	1.367 1.337	.650 .620	27



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN R. Lakehead DATE 19FEB65
CHECKED L. Geer 10 Mar 65
APPROVAL H. Moore 26 MAR65
APPROVAL D O Bryant 3/26/65
APPROVAL 3-26-65
NASA APPROVAL W J Rhine 4-26-65
MIT APPROVAL W Kupfer 21 Apr 65
MIT APPROVAL C Copeling 4/1/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAP, PROTECTIVE,
ELECTRIC CONNECTOR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006455
SCALE NONE
WT
SHEET 1 OF 1

1006455 A

— 1006455

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	CLASS A RELEASE PER TDRR 18388	21Apr65	WK

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

B. MARKING: UNITS SHALL BE PERMANENTLY MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

C. PREPARATION FOR DELIVERY: PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 7.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MARKING REQUIREMENTS AS SPECIFIED HEREIN.

B. DIMENSIONS AS SPECIFIED.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) A CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF MIL-Q-9858.

(2) A CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:

A. CONSTRUCTION: THIS CAP SHALL HAVE A RETAINING DEVICE CONSISTING OF 4 BALLS PLACED 90° APART AND HELD IN PLACE BY A SPRING-LOADED COUPLING RING AS INDICATED IN OUTLINE.

B. MATERIAL AND FINISH:

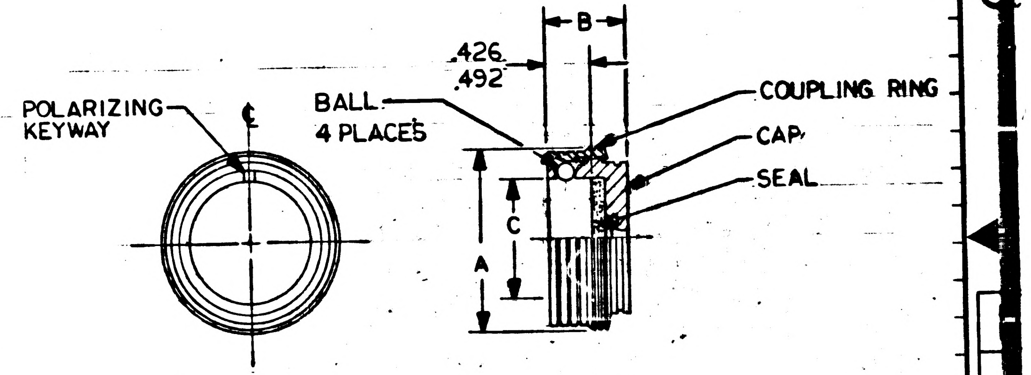
(1) CAP AND COUPLING RING: ALUMINUM ALLOY CONFORMING TO QQ-A-270, QQ-A-325 OR MIL-A-12545 (ORD), CADMIUM PLATED PER QQ-P-416 CLASS 2, TYPE I.

(2) BALLS: CORROSION-RESISTANT STEEL

(3) SEAL: NEOPRENE RUBBER

C. THIS CAP MAY BE USED WITH CONNECTORS PER NASA DRAWING 1012151-013 THRU 016.

DASH NO.	DIMENSIONS		
	A	B MAX	C
-001	.921 .891	.703	.569 .589



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN R. L[illegible] DATE 19FEB65
CHECKED [illegible] 10 Mar 65
APPROVAL H. [illegible] 26 MAR65
APPROVAL D. O Bryant 3/26/65
APPROVAL [illegible] 3-26-65
NASA APPROVAL W. J. Rhine 4-21-65
MIT APPROVAL W. Kupfer 21Apr65
MIT APPROVAL C. Sperling 4/20/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAP, PROTECTIVE,
ELECTRIC CONNECTOR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006455
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006456 A

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL BE CAPABLE OF MEETING ALL THE REQUIREMENTS OF MIL-R-94/5A, TYPE RV4NAYSD__A, EXCEPT FOR SPECIAL RESISTANCE VALUE AS SPECIFIED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

C. PART MARKING: UNITS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, RESISTANCE VALUE AND TOLERANCE, WATTAGE RATING, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS REFERENCED ON MIL-R-94/5A.

(2) MARKING: AS SPECIFIED HEREIN.

~~(3) ROTATION: 315° ± 5°~~

(4) STOP STRENGTH: 8 POUND-INCHES MINIMUM TORQUE.

B. ELECTRICAL CHARACTERISTICS:

(1) TOTAL RESISTANCE: 2000 OHMS ± 10%.

(2) MINIMUM RESISTANCE: 25 OHMS MAXIMUM.

(3) RATED CONTINUOUS WORKING VOLTAGE (AT 70°C): 63 VOLTS. THIS RATING IS A FUNCTION OF TOTAL POWER DISSIPATION (2 WATTS NOMINAL) WHICH MUST BE DERATED TO ZERO AT 120°C.

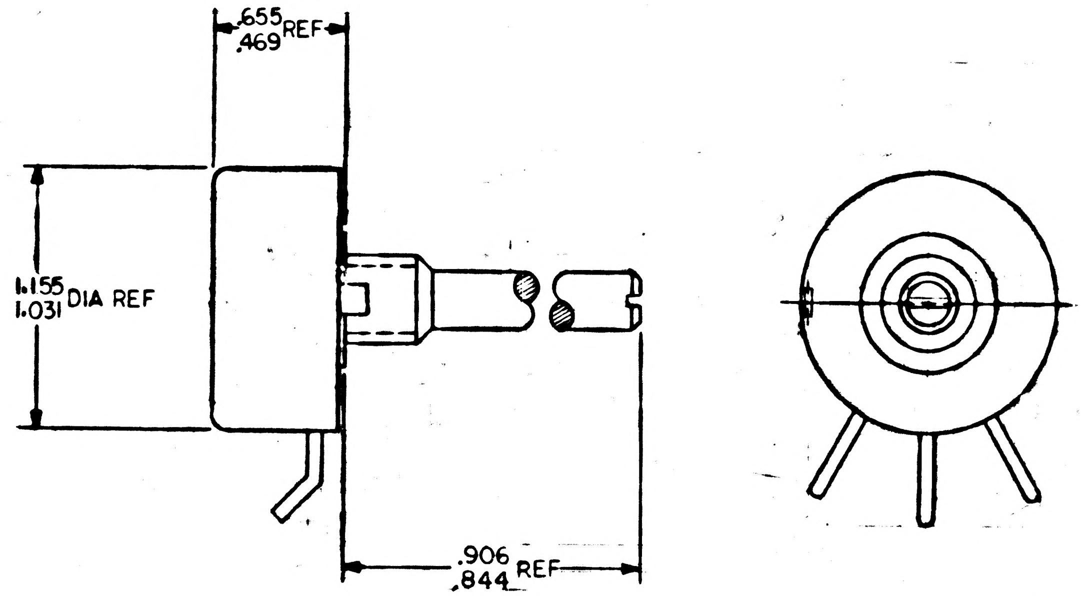
(4) RESISTANCE-ROTATION CHARACTERISTIC: LINEAR TAPER "A".

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION:

(1) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF MIL-R-94/5A AND THIS DRAWING.

~~(2) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF MIL-Q-9858.~~

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 18213		
A	REVISED PER TDRR 19932 DR SA Baron CHK R Martin APPD H Maynard		17 65



1006456 A

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN J.P. Leonard DATE 1 Mar 65
CHECKED 2 Mar 65
APPROVAL H 26 MAR 65
APPROVAL D. O'Bryant 3/26/65
APPROVAL
NASA APPROVAL
MIT APPROVAL MG Murley 4/13/65
MIT APPROVAL C Sperling 4/4/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE, COMPOSITION

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006456

SCALE NONE WT SHEET 1 OF 1

—	1006456

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS A RELEASE PER TDRR 18213		

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL BE CAPABLE OF MEETING ALL THE REQUIREMENTS OF MIL-R-94/5A, TYPE RV4NAYSD__A, EXCEPT FOR SPECIAL RESISTANCE VALUE AS SPECIFIED HEREIN.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   C. PART MARKING: UNITS SHALL BE MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, RESISTANCE VALUE AND TOLERANCE, WATTAGE RATING, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED HEREIN.

      (3) ROTATION: 315° ± 5°

      (4) STOP STRENGTH: 8 POUND-INCHES MINIMUM TORQUE.

   B. ELECTRICAL CHARACTERISTICS:

      (1) TOTAL RESISTANCE: 2000 OHMS ± 10%.

      (2) MINIMUM RESISTANCE: 25 OHMS MAXIMUM.

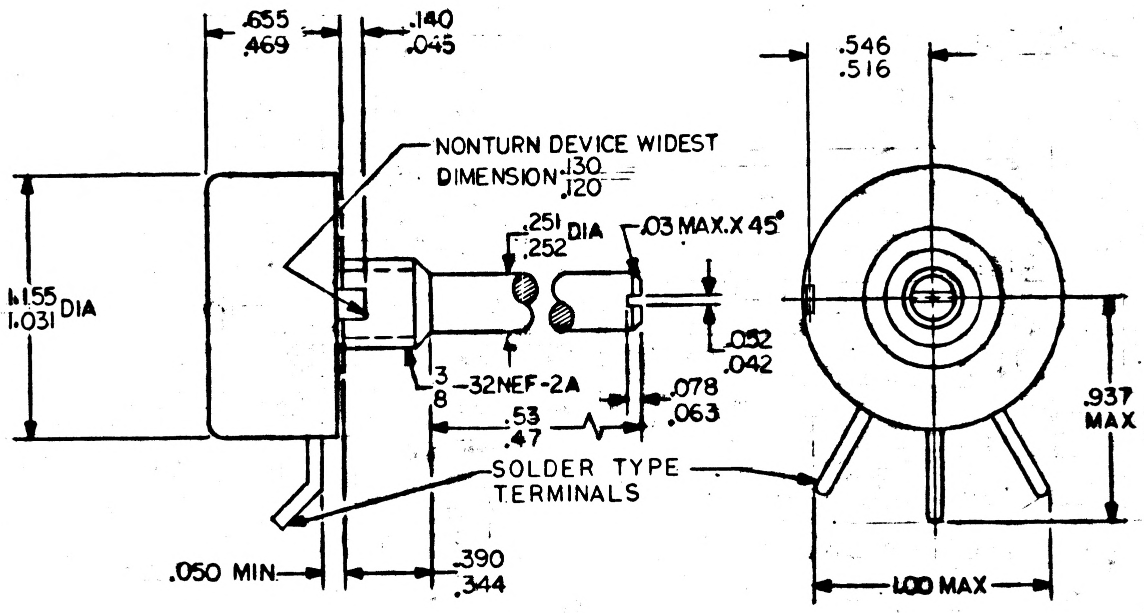
      (3) RATED CONTINUOUS WORKING VOLTAGE (AT 70°C): 63 VOLTS. THIS RATING IS A FUNCTION OF TOTAL POWER DISSIPATION (2 WATTS NOMINAL) WHICH MUST BE DERATED TO ZERO AT 120°C.

      (4) RESISTANCE-ROTATION CHARACTERISTIC: LINEAR TAPER "A".

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION

      (1) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF MIL-R-94/5A AND THIS DRAWING.

      (2) CERTIFICATE OF COMPLIANCE WITH THE REQUIREMENTS OF MIL-Q-9858.



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±
DECIMALS .xxx ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN J.P. Leonard DATE 1 Mar 65
CHECKED A. Gaar 2 Mar 65
APPROVAL H. Moree 26 MAR 65
APPROVAL D. O'Bryant 3/26/65
APPROVAL J. Brown 3/29/65
NASA APPROVAL G. C. W 30 April 65
MIT APPROVAL MG Murley 4/13/65
MIT APPROVAL C Sperling 4/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE, COMPOSITION

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006456
SCALE NONE
WT
SHEET 1 OF 1

1006464 A

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

B. UNIT MARKING:

(1) MANUFACTURER'S NAMEPLATE, IDENTIFICATION OF UNIT, ADDRESS, TRADEMARK, ETC TO APPEAR ON REAR OF UNIT TOGETHER WITH THE NASA DRAWING NUMBER AND REVISION LETTER (THIS INFO NOT TO APPEAR ON FRONT PANEL).

(2) FRONT PANEL MARKING: FUNCTIONAL MARKING TO BE SILK-SCREENED .12 AND .19 HIGH BLACK CHARACTERS WITH .03 LINE WIDTH, PER ND 1002019, UNLESS OTHERWISE SPECIFIED.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) VISUAL: FRONT PANELS SHALL BE WELL FINISHED AND PROTECTED. THERE SHALL BE NO SCRATCHES IN THE PROTECTIVE FINISHES AND THE SILK-SCREENED MARKING SHALL BE SHARP, FULL, AND WELL DEFINED.

B. ELECTRICAL OUTPUT AND REGULATION (VOLTAGE REGULATED):

(1) REMOTE PROGRAMMING: 200 OHMS/VOLT OR 1.0 VOLT/VOLT OVER THE ENTIRE VOLTAGE RANGE FOR THE 20V AND 13V SUPPLIES ONLY.

(2) OUTPUT VOLTAGE AND CURRENT:

VOLTAGE RANGE: 0-11 0-20, & 0-40 VDC
CURRENT RANGE: 0-8.0, 0-2.2 & 0-1.1 AMPERES OVER THE ENTIRE VOLTAGE RANGE.

(3) RIPPLE AND NOISE: 0.25 MILLIVOLTS RMS MAXIMUM, OR 1.0 MILLIVOLT PEAK-PEAK MAXIMUM WITH EITHER POSITIVE OR NEGATIVE GROUND.

(4) TEMPERATURE/VOLTAGE COEFFICIENT: 0.015%/°C MAXIMUM.

(5) REGULATION: 0.015% OR 1.0 MILLIVOLT, WHICHEVER IS GREATER, FOR INPUT VARIATIONS FROM 105-135 VRMS OR LOAD VARIATIONS FROM 0 TO FULL LOAD.

C. ELECTRICAL OUTPUT AND REGULATION (CURRENT REGULATED):

(1) OUTPUT CURRENT AND VOLTAGE (AT 50°C):

CURRENT RANGE: 1.0-8.0A, 0.40-2.2A, 0.26-1.1A
VOLTAGE RANGE: 0-11 VDC, 0-20 VDC, 0-40 VDC OVER THE RESPECTIVE CURRENT RANGES.

(2) RIPPLE AND NOISE: 1.0 MILLIAMPERE RMS MAXIMUM WITH EITHER POSITIVE OR NEGATIVE GROUND.

(3) REGULATION: WITHIN 15 MILLIAMPERES MAXIMUM WITH INPUT VARIED FROM 105 TO 135 VRMS AND LOAD VARIED FROM 0 TO RATED VOLTAGE.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

(2) EACH UNIT SHALL BE FURNISHED WITH 2 COPIES OF AN OPERATING AND MAINTENANCE MANUAL.

3. DESIGN:

A. POWER CONSUMPTION: 325, 135, & 120 WATTS MAXIMUM FOR 10, 20, & 40 V SUPPLIES RESPECTIVELY.

B. INPUT VOLTAGE: 105-135 VRMS AT 45-480 CPS.

C. AMBIENT TEMPERATURE RANGE:

(1) OPERATING: 0°C TO +50°C AT FULL LOAD CONTINUOUSLY.

(2) STORAGE: -55°C TO +85°C.

D. INPUT AND OUTPUT CONNECTIONS: BARRIER TERMINAL BLOCK ON REAR OF CHASSIS. SEE FIGURE 1.

E. METER: SQUARE OR RECT RUGGEDIZED AMMETER PER MIL-M-10304 ON FRONT PANEL FOR EACH SUPPLY.

F. CONTROLS:

(1) POWER: ON-OFF SWITCH WITH GREEN INDICATOR LIGHT ON FRONT PANEL FOR EACH SUPPLY.

(2) OUTPUT CONTROLS: COARSE AND FINE VOLTAGE ADJUSTMENT ON REAR OF CHASSIS.

(3) REMOTE SENSING: PROVISION FOR REMOTE SENSING TO ELIMINATE OUTPUT LEAD RESISTANCE EFFECT ON REGULATION.

G. OVERLOAD PROTECTION:

(1) THERMAL: THERMOSTAT, (RESET BY TURNING POWER OFF).

(2) INTERNAL FAILURE: FUSES. INTERNAL, BELOW TOP COVER.

(3) EXTERNAL OVERLOAD: PRESET, AUTOMATIC CURRENT-LIMITING CIRCUIT (INCLUDING SHORT-CIRCUITS) FOR MAXIMUM VALUES OF CURRENT RATING.

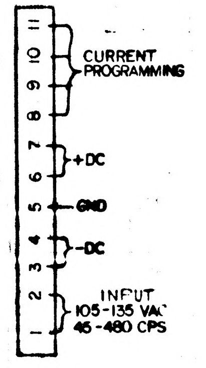
H. FRONT PANELS:

(1) FINISH (PANEL FRONT AND EDGES): FINISH IN ACCORDANCE WITH MIL-F-14072, PS13, TYPE I EXCEPT THE CHROMATE FILM PER MIL-C-5541 SHALL BE ELECTRICALLY CONDUCTIVE. PAINT 2 COATS OF TT-E-529 LIGHT GREY, CLASS B, SEMIGLOSS ENAMEL (COLOR 26440 OF FED-STD-595).

(2) CONTROL KNOBS: MS 91528, BLACK MATTE FINISH WHERE POSSIBLE.

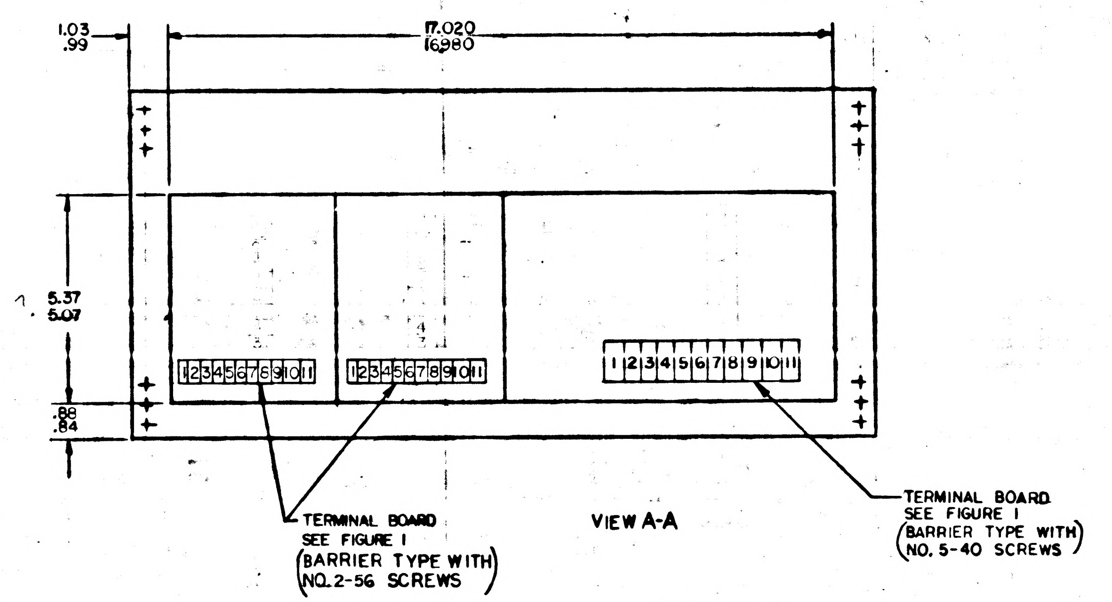
(3) HARDWARE: MS 51959 (CROSS RECESSED, FLAT HEAD) WHERE POSSIBLE. PAN HEAD SCREWS TO BE MS 51957.

(4) MATERIAL: 2024-T3 ALUMINUM PER QQ-A-250/4 OR QQ-A-250/11.



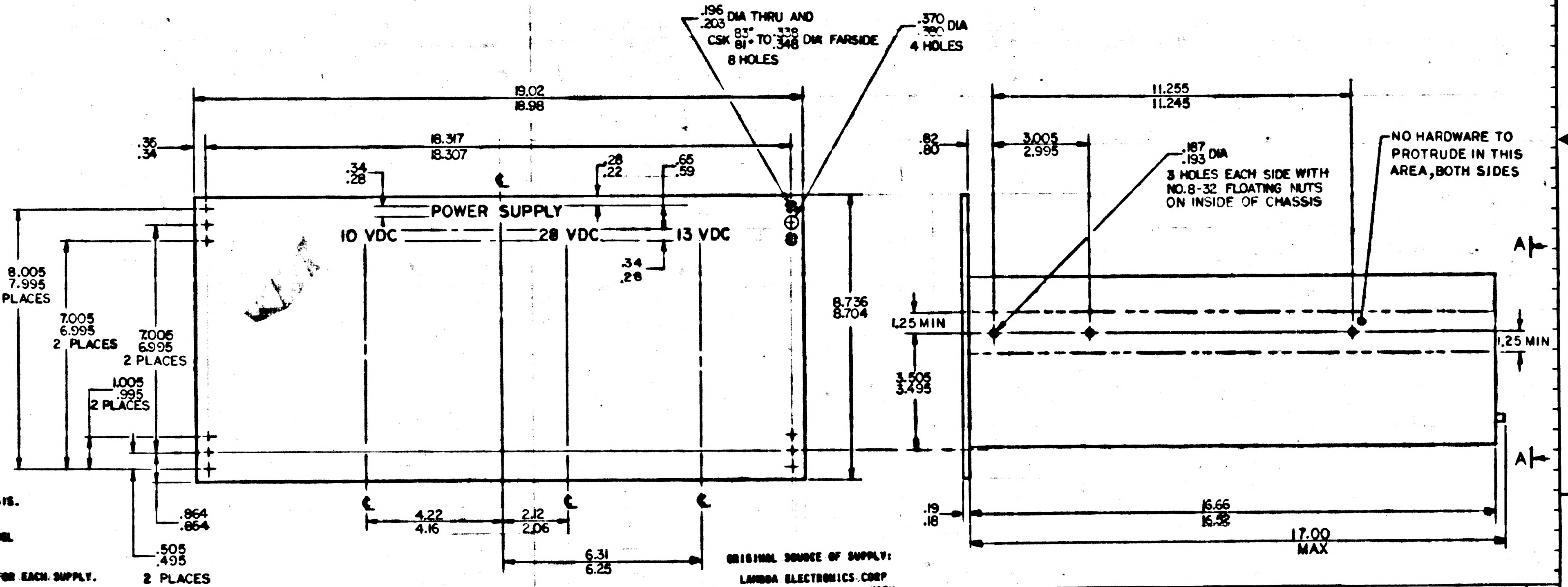
11
10
9
8
7
6
5
4
3
2
1
CURRENT PROGRAMMING
+DC
GND
-DC
INPUT
105-135 VAC
45-480 CPS

FIGURE 1



1.03
.99
17.020
16.980
5.37
5.07
.88
.84
1 2 3 4 5 6 7 8 9 10 11
1 2 3 4 5 6 7 8 9 10 11
1 2 3 4 5 6 7 8 9 10 11
TERMINAL BOARD
SEE FIGURE 1
(BARRIER TYPE WITH NO. 2-56 SCREWS)
TERMINAL BOARD
SEE FIGURE 1
(BARRIER TYPE WITH NO. 5-40 SCREWS)

VIEW A-A



.196
.203 DIA THRU AND
CSK 83° / 81° TO .370 / .380 DIA FARSIDE
8 HOLES
.370
.380 DIA
4 HOLES
19.02
18.98
18.317
18.307
.35
.34
.34
.28
.28
.22
.65
.59
POWER SUPPLY
10 VDC
28 VDC
13 VDC
.34
.28
8.005
7.995
2 PLACES
7.005
6.995
2 PLACES
7.006
6.995
2 PLACES
1.005
.995
2 PLACES
8.736
8.704
.864
.864
.505
.495
2 PLACES
4.22
4.16
2.12
2.06
6.31
6.25
11.255
11.245
.82
.80
3.005
2.995
.187
.193 DIA
3 HOLES EACH SIDE WITH NO. 8-32 FLOATING NUTS ON INSIDE OF CHASSIS
NO HARDWARE TO PROTRUDE IN THIS AREA, BOTH SIDES
A
A
1.25 MIN
1.25 MIN
3.505
3.495
.19
.18
16.66
16.52
17.00
MAX

ORIGINAL SOURCE OF SUPPLY:
LAMBDA ELECTRONICS CORP
MELVILLE, L.I., NEW YORK
CODE IDENT NO. 00103
MODEL NO. 0-2003-1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25097		
1	REVISED PER CCA R25154 DR J. Doty CHK APPD H. Maynard	65	
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26688 DR CHK JCJ APPD H. Maynard		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN DATE 28 APR 65
CHECKED 3 MAY 65
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY ASSY

SOURCE CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006464
SCALE NONE
WT
SHEET 1 OF 1

1006464 A

–	1006464

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25097		
1	REVISED PER CCA R25154 DR J. Doty CHK J D'Fazy APPD H. Maynak	65	
–	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

B. UNIT MARKING:

(1) MANUFACTURER'S NAMEPLATE, IDENTIFICATION OF UNIT, ADDRESS, TRADEMARK, ETC TO APPEAR ON REAR OF UNIT TOGETHER WITH THE NASA DRAWING NUMBER AND REVISION LETTER (THIS INFO NOT TO APPEAR ON FRONT PANEL).

(2) FRONT PANEL MARKING: FUNCTIONAL MARKING TO BE SILK-SCREENED .12 AND .19 HIGH BLACK CHARACTERS WITH .03 LINE WIDTH, PER ND 1002019, UNLESS OTHERWISE SPECIFIED.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) VISUAL: FRONT PANELS SHALL BE WELL FINISHED AND PROTECTED. THERE SHALL BE NO SCRATCHES IN THE PROTECTIVE FINISHES AND THE SILK-SCREENED MARKING SHALL BE SHARP, FULL, AND WELL DEFINED.

B. ELECTRICAL OUTPUT AND REGULATION (VOLTAGE REGULATED):

(1) REMOTE PROGRAMMING: 200 OHMS/VOLT OR 1.0 VOLT/VOLT OVER THE ENTIRE VOLTAGE RANGE FOR THE 28V AND 13V SUPPLIES ONLY.

(2) OUTPUT VOLTAGE AND CURRENT:

VOLTAGE RANGE: 0-11 0-20, & 0-40 VDC
CURRENT RANGE: 0-8.0, 0-2.2 & 0-1.1 AMPERES OVER THE ENTIRE VOLTAGE RANGE.

(3) RIPPLE AND NOISE: 0.25 MILLIVOLTS RMS MAXIMUM, OR 1.0 MILLIVOLT PEAK-PEAK MAXIMUM WITH EITHER POSITIVE OR NEGATIVE GROUND.

(4) TEMPERATURE/VOLTAGE COEFFICIENT: 0.015%/°C MAXIMUM.

(5) REGULATION: 0.015% OR 1.0 MILLIVOLT, WHICHEVER IS GREATER, FOR INPUT VARIATIONS FROM 105-135 VRMS OR LOAD VARIATIONS FROM 0 TO FULL LOAD.

C. ELECTRICAL OUTPUT AND REGULATION (CURRENT REGULATED):

(1) OUTPUT CURRENT AND VOLTAGE (AT 50°C):

CURRENT RANGE: 1.0-8.0A, 0.40-2.2A, 0.26-1.1A
VOLTAGE RANGE: 0-11 VDC, 0-20 VDC, 0-40 VDC OVER THE RESPECTIVE CURRENT RANGES.

(2) RIPPLE AND NOISE: 1.0 MILLIAMPERE RMS MAXIMUM WITH EITHER POSITIVE OR NEGATIVE GROUND.

(3) REGULATION: WITHIN 15 MILLIAMPERES MAXIMUM WITH INPUT VARIED FROM 105 TO 135 VRMS AND LOAD VARIED FROM 0 TO RATED VOLTAGE.

D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

(2) EACH UNIT SHALL BE FURNISHED WITH 2 COPIES OF AN OPERATING AND MAINTENANCE MANUAL.

3. DESIGN:

A. POWER CONSUMPTION: 325, 135, & 120 WATTS MAXIMUM FOR 10, 20, & 40 V SUPPLIES RESPECTIVELY.

B. INPUT VOLTAGE: 105-135 VRMS AT 45-480 CPS.

C. AMBIENT TEMPERATURE RANGE:

(1) OPERATING: 0°C TO +50°C AT FULL LOAD CONTINUOUSLY.

(2) STORAGE: -55°C TO +85°C.

D. INPUT AND OUTPUT CONNECTIONS: BARRIER TERMINAL BLOCK ON REAR OF CHASSIS. SEE FIGURE 1.

E. METER: SQUARE OR RECT RUGGEDIZED AMMETER PER MIL-M-10304 ON FRONT PANEL FOR EACH SUPPLY.

F. CONTROLS:

(1) POWER: ON-OFF SWITCH WITH GREEN INDICATOR LIGHT ON FRONT PANEL FOR EACH SUPPLY.

(2) OUTPUT CONTROLS: COARSE AND FINE VOLTAGE ADJUSTMENT ON REAR OF CHASSIS.

(3) REMOTE SENSING: PROVISION FOR REMOTE SENSING TO ELIMINATE OUTPUT LEAD RESISTANCE EFFECT ON REGULATION.

G. OVERLOAD PROTECTION:

(1) THERMAL: THERMOSTAT, (RESET BY TURNING POWER OFF).

(2) INTERNAL FAILURE: FUSES. INTERNAL, BELOW TOP COVER.

(3) EXTERNAL OVERLOAD: PRESET, AUTOMATIC CURRENT-LIMITING CIRCUIT (INCLUDING SHORT-CIRCUITS) FOR MAXIMUM VALUES OF CURRENT RATING.

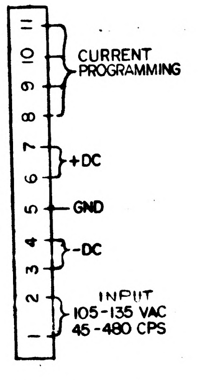
H. FRONT PANELS:

(1) FINISH (PANEL FRONT AND EDGES): FINISH IN ACCORDANCE WITH MIL-F-14072, P513, TYPE I EXCEPT THE CHROMATE FILM PER MIL-C-5541 SHALL BE ELECTRICALLY CONDUCTIVE. PAINT 2 COATS OF TT-E-529 LIGHT GREY, CLASS B, SEMIGLOSS ENAMEL (COLOR 26440 OF FED-STD-595).

(2) CONTROL KNOBS: MS 91528, BLACK MATTE FINISH WHERE POSSIBLE.

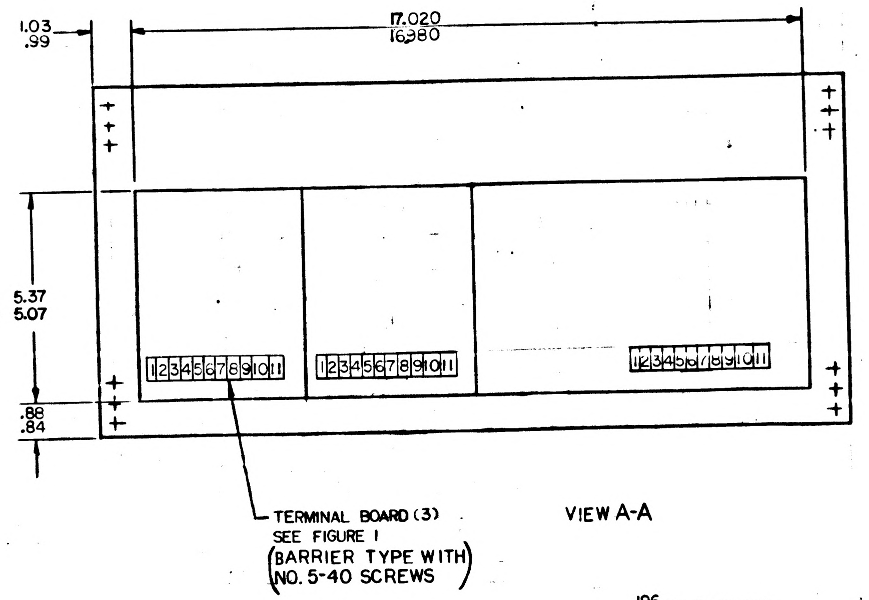
(3) HARDWARE: MS 51959 (CROSS RECESSED, FLAT HEAD) WHERE POSSIBLE. PAN HEAD SCREWS TO BE MS 51957.

(4) MATERIAL: 2024-T3 ALUMINUM PER QQ-A-250/4 OR QQ-A-250/11.



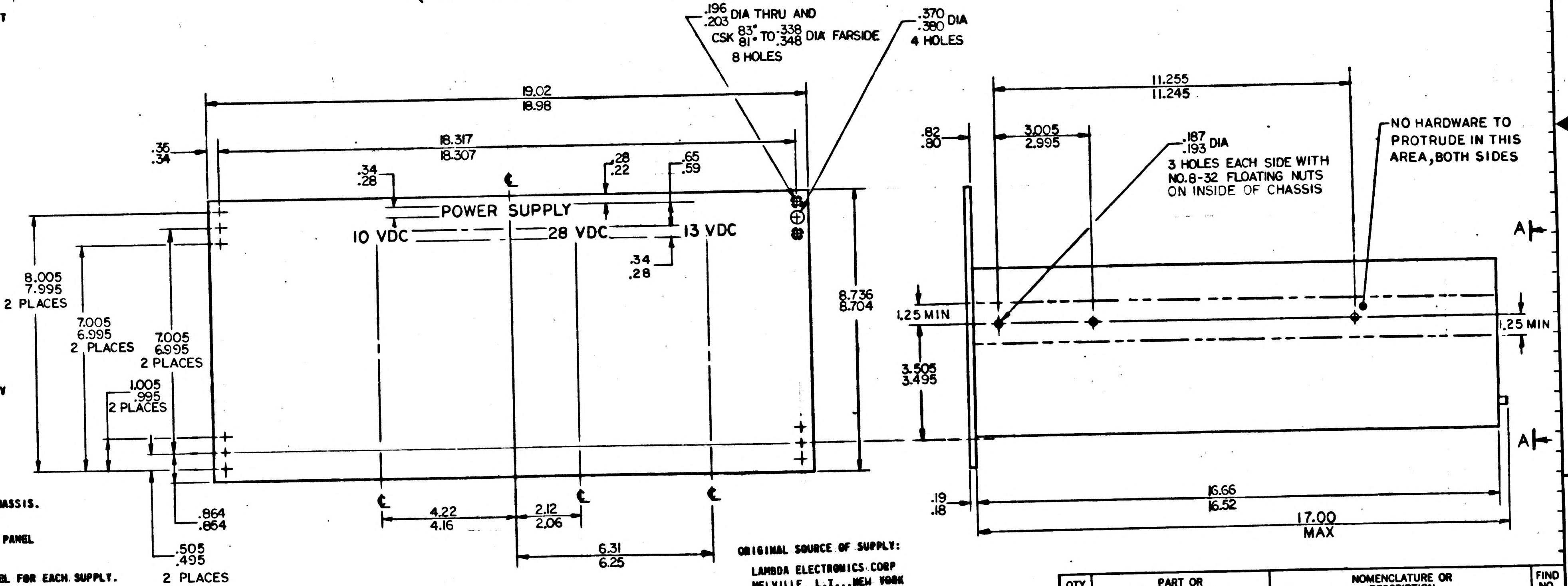
11
10
9
8
7
6
5
4
3
2
1
CURRENT PROGRAMMING
+DC
GND
-DC
INPUT
105-135 VAC
45-480 CPS

FIGURE 1



1.03
.99
17.020
16.980
5.37
5.07
.88
.84
1 2 3 4 5 6 7 8 9 10 11
TERMINAL BOARD (3)
SEE FIGURE 1
(BARRIER TYPE WITH NO. 5-40 SCREWS)

VIEW A-A



.196
.203 DIA THRU AND
CSK 83° / 81° TO .338 / .348 DIA FARSIDE
8 HOLES
.370
.380 DIA
4 HOLES
19.02
18.98
18.317
18.307
.35
.34
.34
.28
.28
.22
.65
.59
POWER SUPPLY
10 VDC
28 VDC
13 VDC
.34
.28
8.005
7.995
2 PLACES
7.005
6.995
2 PLACES
7.005
6.995
2 PLACES
1.005
.995
2 PLACES
8.736
8.704
.864
.854
.505
.495
2 PLACES
4.22
4.16
2.12
2.06
6.31
6.25
11.255
11.245
.82
.80
3.005
2.995
.187
.193 DIA
3 HOLES EACH SIDE WITH NO. 8-32 FLOATING NUTS ON INSIDE OF CHASSIS
NO HARDWARE TO PROTRUDE IN THIS AREA, BOTH SIDES
A
A
1.25 MIN
1.25 MIN
3.505
3.495
.19
.18
16.66
16.52
17.00
MAX

ORIGINAL SOURCE OF SUPPLY:
LAMBDA ELECTRONICS CORP
MELVILLE, L.I., NEW YORK
CODE IDENT NO. 80103
MODEL NO. 0-2003-1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS9-497
DRAWN W. Hellenberg DATE 28 APR 65
CHECKED E Urban 20 MAY 65
APPROVAL 6/16/65
APPROVAL D. O'Bryant 6/18/65
APPROVAL 6/17/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY ASSY

SOURCE CONTROL DRAWING

CODE IDENT NO. 49956
SIZE D
NASA DRAWING NO. 1006464
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	1006465

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25097		
1	REVISED PER CCA R25179 DR J. Doty CHK J. J. Fagan APPD	21 Oct 65	S.F.S.
—	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-3786 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

C. PART MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), REVISION LETTER, TERMINAL IDENTIFICATION, AND DECK IDENTIFICATION AS SHOWN, USING INK 1006271-10.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) DETENT ACTION: UNITS SHALL HAVE A DEFINITE DETENT ACTION.

(3) SWITCHING TORQUE: SEE TABLE I.

(4) STOPS: MECHANICAL STOPS, LIMITING TRAVEL TO VALUES SHOWN IN TABLE I, SHALL WITHSTAND 50 POUND-INCHES MINIMUM TORQUE.

(5) MARKING: IN ACCORDANCE WITH NOTE 1.C.

(6) SWITCH CHARACTERISTICS: 2 POLES/DECK, NON-SHORTING CONTACTS, 15° INDEX. SEE TABLE I.

B. ELECTRICAL CHARACTERISTICS:

(1) CONTACT RESISTANCE: 0.005 OHMS MAXIMUM (0.010 OHMS INITIAL RESISTANCE MAXIMUM) AT 100 MILLIAMPERES DC WHEN A POTENTIAL OF 2 VOLTS IS APPLIED WITH A SUITABLE DROPPING RESISTOR IN SERIES WITH CONTACTS (MIL-STD-202C, METHOD 307). 10 COMPLETE (STOP-STOP) ACTUATIONS SHALL BE MADE PRIOR TO MEASUREMENTS.

(2) CAPACITANCE (CONTACT-CONTACT AND CONTACT-SLIPRING): 2.5 PICOFARADS MAXIMUM AT 1.0 KILOCYCLE PER SECOND (MIL-STD-202C, METHOD 305).

(3) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VRMS BETWEEN CURRENT-CARRYING PARTS AND BETWEEN CURRENT-CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

(4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VDC BETWEEN CURRENT-CARRYING PARTS AND BETWEEN CURRENT-CARRYING PARTS AND THE SHAFT AND METAL MOUNTING PLATE.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN MATERIAL AND FINISH REQUIREMENTS.

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) CONTACT CURRENT RATING (CONTINUOUS): 10 AMPERES RMS MAXIMUM.

(2) CONTACT CURRENT RATING (SWITCHING): 2 AMPERES RMS MAXIMUM AT 115 VOLTS RMS, 60 CPS, RESISTIVE LOAD.

B. OPERATING LIFE: 10,000 CYCLES MINIMUM.

C. CONSTRUCTION:

(1) WIPER BLADES: MULTILEAF TYPE.

(2) CONTACT MATERIAL: SILVER ALLOY (90% Ag - 10% Cu), PLUS 0.000015 ELECTROPLATED GOLD, EXCEPT CONTACT SURFACE.

(3) CONTACTS LUBRICANT: HIGH MOLE ESTER

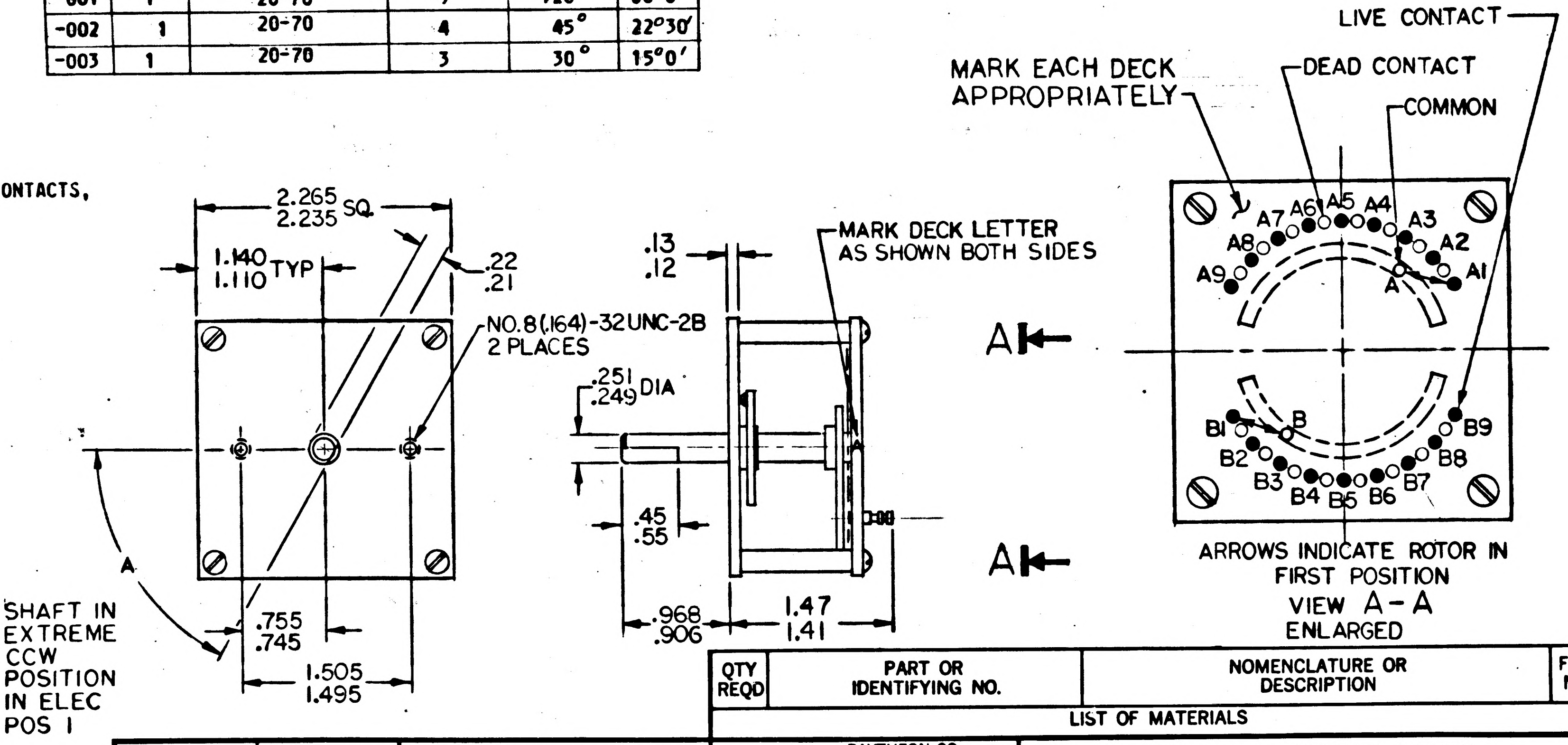
(4) TERMINALS: SHALL ACCOMODATE 2 NUMBER 20 AWG STRANDED CONDUCTORS.

(5) TERMINAL BOARDS: PAPER BASE EPOXY RESIN PER MIL-P-22324, TYPE PEE.

(6) MOUNTING PLATE; ALUMINUM ALLOY PER QQ-A-250/4, TEMP T3 (2024-T3), ANODIZED PER MIL-A-8625, TYPE 1.

TABLE I

DASH NO.	NO. DECKS	SWITCHING TORQUE OUNCE-INCHES	SWITCH POSITIONS	TOTAL ROTATION	A 0°30′
-001	1	20-70	9	120°	60°0′
-002	1	20-70	4	45°	22°30′
-003	1	20-70	3	30°	15°0′


2.265
2.235 SQ.
1.140
1.110 TYP
.22
.21
NO.8(.164)-32UNC-2B
2 PLACES
A
.755
.745
1.505
1.495
SHAFT IN EXTREME CCW POSITION IN ELEC POS I
.13
.12
MARK DECK LETTER AS SHOWN BOTH SIDES
.251
.249 DIA
.45
.55
.968
.906
1.47
1.41
A
A
MARK EACH DECK APPROPRIATELY
LIVE CONTACT
DEAD CONTACT
COMMON
A1 A2 A3 A4 A5 A6 A7 A8 A9
A
B
B1 B2 B3 B4 B5 B6 B7 B8 B9

ARROWS INDICATE ROTOR IN FIRST POSITION

VIEW A-A ENLARGED

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR'S LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DMS DATE 26 MAY 65
CHECKED E. Urban 17 JUN 65
APPROVAL P.E. Auth 8/16/65 M. Stahl 11/29/65
APPROVAL D. O'Bryant 8/16/65
APPROVAL M. J. Brown 8/17/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Kopf 9 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
2 POLE / DECK, NON SHORTING, 15° INDEX
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006465
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006465 —

—	1006466

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25097		
1	REVISED PER CCA R25154 DR J. Doty CHK J.D.Fry APPD H. Maynard		
—	RELEASED CLASS A PER TDBR 24524		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   B. UNIT MARKING:

      (1) MANUFACTURER'S NAMEPLATE, IDENTIFICATION OF UNIT, ADDRESS, TRADEMARK, ETC TO APPEAR ON REAR OF UNIT TOGETHER WITH THE NASA DRAWING NUMBER AND REVISION LETTER (THIS INFO NOT TO APPEAR ON FRONT PANEL).

      (2) FRONT PANEL MARKING: FUNCTIONAL MARKING TO BE SILK-SCREENED .12 AND .19 HIGH BLACK CHARACTERS WITH .03 LINE WIDTH, PER ND 1002019, UNLESS OTHERWISE SPECIFIED.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (100%)

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) VISUAL: FRONT PANELS SHALL BE WELL FINISHED AND PROTECTED. THERE SHALL BE NO SCRATCHES IN THE PROTECTIVE FINISHES AND THE SILK-SCREENED MARKING SHALL BE SHARP, FULL, AND WELL DEFINED.

   B. ELECTRICAL OUTPUT AND REGULATION (VOLTAGE REGULATED):

      (1) REMOTE PROGRAMMING: 50 OHMS/VOLT OVER THE ENTIRE VOLTAGE RANGE.

      (2) OUTPUT VOLTAGE AND CURRENT:

          VOLTAGE RANGE: 0-9 VDC

          CURRENT RANGE: 0-20 AMP OVER THE ENTIRE VOLTAGE RANGE.

      (3) INTERNAL IMPEDANCE: 0.4 MILLIOHMS MAXIMUM.

      (4) RIPPLE AND NOISE: 0.5 MILLIVOLTS RMS MAX AT 60 CPS TO 1.0 MILLIVOLT RMS MAX AT 400 CPS WITH EITHER POSITIVE OR NEGATIVE GROUND.

      (5) TEMPERATURE/VOLTAGE COEFFICIENT: 0.015%/°C MAXIMUM.

      (6) REGULATION: 0.05% OR 6 MILLIVOLTS, WHICHEVER IS GREATER, FOR INPUT VARIATIONS FROM 105 TO 135 VRMS OR LOAD VARIATIONS FROM 0 TO FULL LOAD.

      (7) TRANSIENT RESPONSE, LINE: OUTPUT WITHIN REGULATION FOR ANY 15 VOLT LINE CHANGE WITHIN 105-135 VRMS.

      (8) TRANSIENT RESPONSE, LOAD: OUTPUT CONSTANT WITHIN 25 MILLIVOLTS FOR 0 - FULL LOAD OR FULL LOAD - 0 CHANGES OCCURING WITHIN 50 MICROSECONDS.

   C. ELECTRICAL OUTPUT AND REGULATION (CURRENT REGULATED):

      (1) OUTPUT CURRENT AND VOLTAGE:

          CURRENT RANGE: 2.0 - 20 AMPERES

          VOLTAGE RANGE: 0 - 9 VDC OVER ENTIRE CURRENT RANGE.

      (2) RIPPLE AND NOISE: 10 MILLIAMPERES RMS MAXIMUM WITH EITHER POSITIVE OR NEGATIVE GROUND.

      (3) REGULATION: WITHIN 0.2% OR 15 MILLIAMPERES, WHICHEVER IS GREATER, WITH INPUT VARIED FROM 105 TO 135 VRMS AND LOAD VARIED FROM 0 TO RATED VOLTAGE.

   D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

      (2) EACH UNIT SHALL BE FURNISHED WITH 2 COPIES OF AN OPERATING AND MAINTENANCE MANUAL.

3. DESIGN:

   A. POWER CONSUMPTION: 650 WATTS MAXIMUM.

   B. INPUT VOLTAGE: 105-135 VRMS AT EITHER 45-66 CPS OR 320-480 CPS. OPERATING FREQUENCY SELECTED BY A SWITCH ON REAR OF CHASSIS.

   C. AMBIENT TEMPERATURE RANGE:

      (1) OPERATING: 0°C TO +50°C AT FULL LOAD CONTINUOUSLY.

      (2) STORAGE: -55°C TO +85°C.

   D. INPUT AND OUTPUT CONNECTIONS: BARRIER TERMINAL BLOCK ON REAR OF CHASSIS. SEE FIGURE 1.

   E. METER: AMMETER PER MIL-M-10304 ON FRONT PANEL FOR EACH SUPPLY.

   F. CONTROLS:

      (1) POWER: ON-OFF SWITCH WITH GREEN INDICATOR LIGHT ON FRONT PANEL.

      (2) OUTPUT CONTROLS: COARSE AND FINE, VOLTAGE AND CURRENT ADJUSTMENTS ON REAR OF CHASSIS.

      (3) OPERATING MODE: "VOLTAGE REGULATED" OR "CURRENT REGULATED" SELECTOR SWITCH WITH A RED INDICATOR LIGHT TO SHOW AUTOMATIC DEPARTURE FROM OPERATING MODE, ALL ON THE FRONT PANEL.

      (4) REMOTE SENSING: PROVISION FOR REMOTE SENSING TO ELIMINATE OUTPUT LEAD RESISTANCE EFFECT ON REGULATION.

   G. OVERLOAD PROTECTION:

      (1) THERMAL: THERMOSTAT, WITH FRONT PANEL INDICATOR (RESET BY TURNING POWER OFF).

      (2) INTERNAL FAILURE: FUSES LOCATED ON CHASSIS REAR.

      (3) EXTERNAL OVERLOAD: ADJUSTABLE, AUTOMATIC CURRENT-LIMITING CIRCUIT (INCLUDING SHORT-CIRCUITS) FOR PRESET VALUES.

   H. FRONT PANELS:

      (1) FINISH (PANEL FRONT AND EDGES): FINISH IN ACCORDANCE WITH MIL-F-14072, P513, TYPE I EXCEPT THE CHROMATE FILM PER MIL-C-5541 SHALL BE ELECTRICALLY CONDUCTIVE. PAINT 2 COATS OF TT-E-529 LIGHT GREY, CLASS B, SEMIGLOSS ENAMEL (COLOR 26440 OF FED-STD-595).

      (2) CONTROL KNOBS: MS 91528, BLACK MATTE FINISH WHERE POSSIBLE.

      (3) HARDWARE: MS 35200 (CROSS RECESSED, FLAT HEAD) WHERE POSSIBLE. PAN HEAD SCREWS TO BE MS 35216.

      (4) MATERIAL: 2024-T3 ALUMINUM ALLOY PER QQ-A-250/4 OR QQ-A-250/11.

ORIGINAL SOURCE OF SUPPLY:

LAMBDA ELECTRONICS CORP.
MELVILLE, L.I., NEW YORK

CODE IDENT NO. 80103
MODEL NO. LE-110-2004

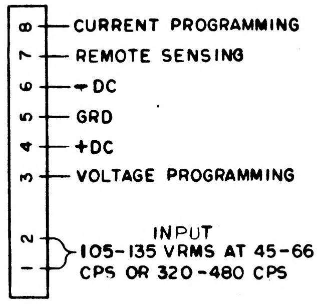
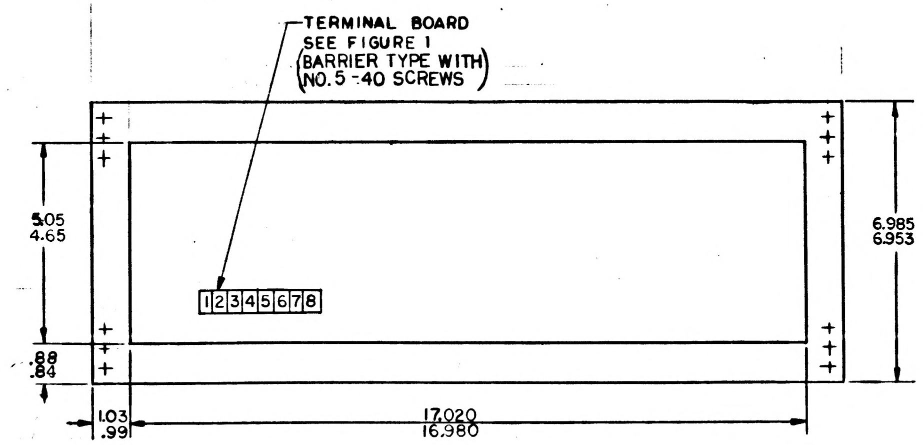
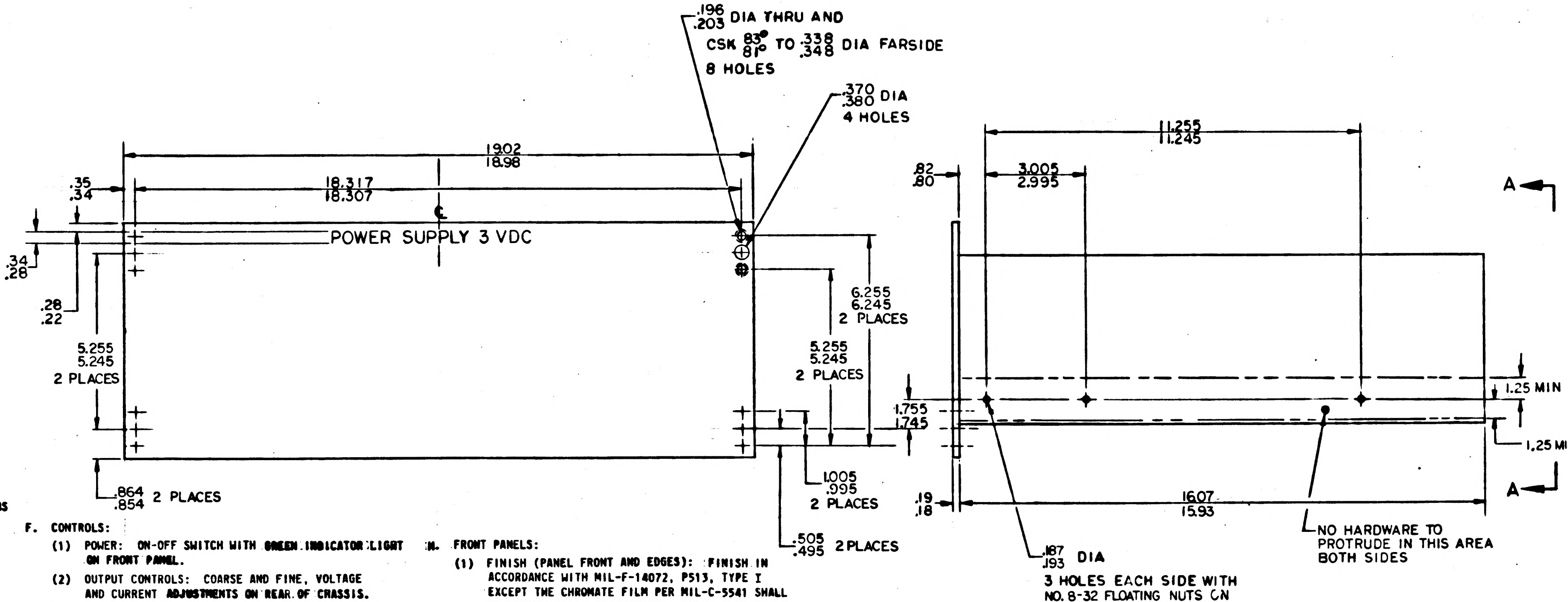

8 CURRENT PROGRAMMING
7 REMOTE SENSING
6 -DC
5 GRD
4 +DC
3 VOLTAGE PROGRAMMING
2
1
INPUT
105-135 VRMS AT 45-66 CPS OR 320-480 CPS

FIGURE 1


TERMINAL BOARD
SEE FIGURE 1
(BARRIER TYPE WITH NO. 5-40 SCREWS)
12345678
5.05
4.65
.88
.84
1.03
.99
17.020
16.980
6.985
6.953

VIEW A A


.196
.203 DIA THRU AND
CSK 83° 81° TO .338 .348 DIA FARSIDE
8 HOLES
.370
.380 DIA
4 HOLES
19.02
18.98
18.317
18.307
.35
.34
.34
.28
.28
.22
POWER SUPPLY 3 VDC
5.255
5.245
2 PLACES
6.255
6.245
2 PLACES
5.255
5.245
2 PLACES
.864
.854 2 PLACES
1.005
.995
2 PLACES
.505
.495 2 PLACES
1.755
1.745
.82
.80
11.255
11.245
3.005
2.995
A
A
1.25 MIN
1.25 MIN
.19
.18
16.07
15.93
.187
.193 DIA
3 HOLES EACH SIDE WITH NO. 8-32 FLOATING NUTS ON INSIDE OF CHASSIS
NO HARDWARE TO PROTRUDE IN THIS AREA BOTH SIDES

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS9-497
DRAWN [illegible] DATE 27 APR 65
CHECKED E. Urban 20 MAY 65
APPROVAL [illegible] 19-6-65
APPROVAL D. O'Bryant 6/18/65
APPROVAL [illegible] 8/17/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL [illegible] 7 Dec 65
MIT APPROVAL [illegible] 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY

SOURCE CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	D	1006466

SCALE NONE WT SHEET 1 OF 1

5 | 4 | 3 | 2 | 1

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1006468 | –

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASE PER CCA R25107		
-	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL BE CAPABLE OF MEETING THE ENVIRONMENTAL REQUIREMENTS OF MIL-R-27208A.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

C. MARKING: UNITS SHALL BE MARKED PER ND 1002019 WITH THE TERMINAL IDENTIFICATION, SCHEMATIC, RESISTANCE RANGE AND TOLERANCE, AND THE NASA PART NUMBER (DRAWING NUMBER, AND DASH NUMBER) AND REVISION LETTER.

D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

A. MECHANICAL:

(1) MARKING AND PREPARATION FOR DELIVERY AS SPECIFIED ABOVE.
(2) DIMENSIONS AND TOLERANCES AS SPECIFIED HEREIN.
(3) UNITS SHALL HAVE MECHANICAL STOPS AND AN ANTI-ROTATE DEVICE.
(4) SHAFT TORQUE: 2 OUNCE-INCHES MAXIMUM.

(5) HARDWARE: EACH UNIT SHALL BE SUPPLIED WITH A FLAT WASHER .020 MAX THICKNESS, A LOCK WASHER .017 MAX THICKNESS AND A MOUNTING NUT .108 MAX THICKNESS.

B. ELECTRICAL:

(1) RESISTANCE RANGE, TOLERANCE AND RESOLUTION: AS SPECIFIED IN TABLE I.

(2) LINEARITY: ± 1%.

(3) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN

A. CONSTRUCTION:

(1) MATERIAL AND FINISH

(a) CASE: BRASS PER QQ-B-626D NICKEL PLATED PER QQ-N-290 CLASS II, TYPE 7.

(b) SHAFT: CORROSION RESISTING STEEL PER FEDERAL STANDARD NO. 66, TYPE 303, PASSIVATED PER MIL-F-14072.

(c) TERMINALS: BRASS PER QQ-B-626D GOLD PLATED PER MIL-G-45204 TYPE I CLASS 1 OVER A .00005 TO .00007 NICKEL STRIKE.

(d) LOCK WASHER: CORROSION RESISTING STEEL PER FEDERAL STANDARD NO. 66, TYPE 410 PASSIVATED PER MIL-F-14072.

(e) FLAT WASHER: BRASS PER QQ-B-613 COMPOSITION 2, NICKEL PLATED PER QQ-N-290 CLASS I, TYPE 7.

(f) MOUNTING NUT: BRASS PER QQ-B-611A, COMPOSITION B, HALF HARD, NICKEL PLATED PER QQ-N-290 CLASS II, TYPE 7.

B. POWER RATING: 2-1/4 WATTS AT 40° C DERATED LINEARLY TO ZERO AT 150° C.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

TABLE I

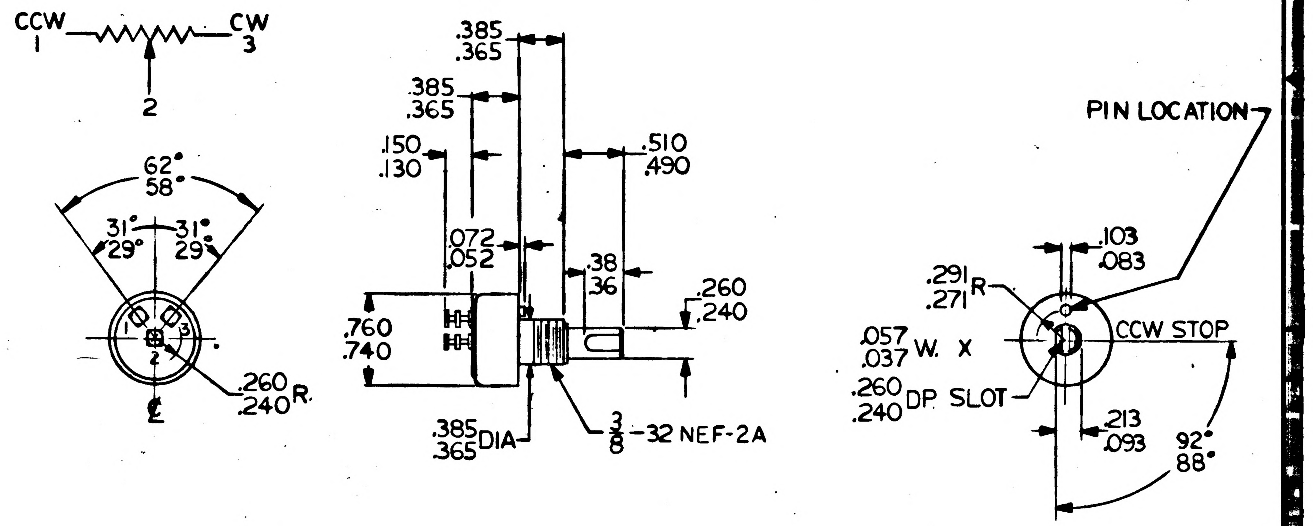
DASH NO.	RESISTANCE OHMS	TOL %	RESOLUTION %
-001	50	± 1	.44
-002	100	↑	.36
-003	250		.23
-004	500		.22
-005	750		.22
-006	1,000		.22
-007	1,500		.22
-008	2,500		.22
-009	5,000		.12
-010	7,500		.10
-011	10,000	↓	.096
-012	50,000	± 1	.062

C. MECHANICAL:

(1) TORQUE:

(a) MECHANICAL STOPS: SHALL BE CAPABLE OF WITHSTANDING 40 OUNCE-INCHES.

(b) ANTI-ROTATE DEVICE: SHALL BE CAPABLE OF WITHSTANDING 80 OUNCE-INCHES.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT

FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497

DRAWN J. Doty DATE 5/28/65
CHECKED [illegible] 1 JUN 65
APPROVAL [illegible] 6/10/65 [illegible] 11/29/65
APPROVAL D. O'Bryan 8/18/65
APPROVAL E A Sears 8-18-65
NASA APPROVAL A. C. METZGER
W. Kapler 7 Dec 65
MIT APPROVAL [illegible] 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE
WIREWOUND, 2 1/4 WATTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956 | SIZE C | NASA DRAWING NO 1006468

SCALE NONE | WT | SHEET 1 OF 1

5 | 4 | 3 | 2 | 1

–	1006469

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25170	9/14/65	
-	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

B. UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TERMINAL IDENTIFICATION, CALIBRATION LOCATION, LOT OR SERIAL NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

(2) SHIPPING CONTAINERS SHALL CONTAIN A "DELICATE INSTRUMENT" WARNING LABEL.

D. ELECTRICAL CHARACTERISTICS (METER):

(1) POWER INPUT: 115 ± 10 VRMS, 50/60 CPS.

(2) FULL SCALE DEFLECTION: 20 MICROAMPERES D.C.

(3) METER ACCURACY: ± 1% OF FULL SCALE DEFLECTION

(4) SET POINT ACCURACY: ± 1% OF FULL-SCALE INDICATION.

(5) SET POINT REPEATABILITY: WITHIN ± 0.1% OF ACTUAL SET POINT.

(6) DEAD-BAND (SET POINT OFF-ON DIFFERENTIAL): 0.25%

E. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

(2) 2 COPIES OF AN OPERATING AND MAINTENANCE MANUAL.

2. ACCEPTANCE & INSPECTION: SAMPLE

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) MARKING: AS SPECIFIED IN NOTES 1.B. & 1.C.

(3) METER FACE: WHITE BACKGROUND WITH BLACK CHARACTERS AND SCALE MARKINGS. CHARACTERS .09 HIGH NOMINAL.

(4) SCALE DIVISIONS: 50 LINEAR DIVISIONS NUMBERED EVERY 5° IN (°F) DEGREES FAHRENHEIT FROM +70°F TO +120°F.

(5) POINTERS: KNIFE EDGE POINTERS WITH MIRROR SCALE.

(6) SET POINTS: 2 SCREWDRIVER ADJUSTMENTS ON METER FRONT.

(7) LEADS: 24 AWG STRANDED, TEFLON INSULATED.

B. ELECTRICAL CHARACTERISTICS (PROBE):

(1) TEMPERATURE-RESISTANCE CHARACTERISTIC: POSITIVE RESISTANCE CHANGE WITH INCREASE IN TEMPERATURE FROM 147.2 OHMS AT +70° ± 1/2°F TO 170 OHMS AT +120° ± 1/2°F. LINEARITY SHALL BE WITHIN ± 0.5 OHM BETWEEN THESE POINTS.

C. ELECTRICAL CHARACTERISTICS (CONTROL MODULE):

(1) POWER INPUT: 115 ± 10 VRMS, 50/60 CPS. CIRCUIT INSENSITIVE TO LINE VOLTAGE CHANGES FROM 105 TO 125 VRMS.

(2) INPUT RESISTANCE VS METER SIGNAL (OUTPUT) CHARACTERISTIC:

(a) ZERO-ADJUST: WITH A 147.2 OHM RESISTOR ACROSS TERMINALS 8 AND 9, THE CURRENT FLOWING AT TERMINALS 5 AND 6 SHALL BE ADJUSTED TO ZERO AT THE APPROXIMATE MID-RANGE OF THE ZERO-ADJUST POTENTIOMETER (P2).

(b) FULL-SCALE ADJUST: WITH A 170.0 OHM RESISTOR ACROSS TERMINALS 8 AND 9, THE CURRENT FLOWING AT TERMINALS 5 AND 6 SHALL BE ADJUSTED TO 20 MICROAMPERES AT THE APPROXIMATE MID-RANGE OF THE FULL-SCALE ADJUST POTENTIOMETER (P1).

(c) LINEARITY: WITH BOTH ZERO AND FULL SCALE ADJUSTMENTS MADE, CHANGE IN RESISTANCE AT TERMINALS 8 & 9 SHALL BE LINEAR WITH RESPECT TO OUTPUT CURRENT AT TERMINALS 5 & 6 WITHIN 1%.

3. DESIGN:

A. OPERATING LIFE:

(1) PROBE: INFINITE (PASSIVE ELEMENT).

(2) METER AND CONTROL MODULE: 3 YEARS MINIMUM WITHIN THE SPECIFIED LIMITS WITHOUT THE NEED FOR MAINTENANCE, (OTHER THAN SCALE ADJUSTMENTS), AND 3 MONTHS MINIMUM WITHOUT THE NEED FOR RECALIBRATION.

B. CONSTRUCTION & TYPE:

(1) METER MOVEMENT: D'ARSONVAL, TAUT-BAND

(2) SET POINT ACTUATION: LAMP AND PHOTOCELL WITH LIGHT-INTERRUPTING VANE.

(3) CONTROL MODULE: BRIDGE RECTIFIER AND RESISTANCE BRIDGE CIRCUIT.

(4) TEMPERATURE PROBE: PURE NICKEL.

C. SYSTEM ACCURACY: ± 1/2°F

DASH NO.	DESCRIPTION
-001	METER
-002	TEMPERATURE PROBE
-003	CONTROL MODULE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON	RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-497	
DRAWN H. Wong	DATE 13 JUL 65
CHECKED A. [illegible]	2 AUG 65
APPROVAL [illegible] 9/11/65	
APPROVAL D. O'Bryant 9/10/65	
APPROVAL [illegible] 9/14/65	
NASA APPROVAL A. C. METZGER	
MIT APPROVAL W. Kopf 7 Dec 65	
MIT APPROVAL [illegible] 12/6/65	

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL ASSEMBLY, TEMPERATURE, INDICATING
SPECIFICATION CONTROL DRAWING

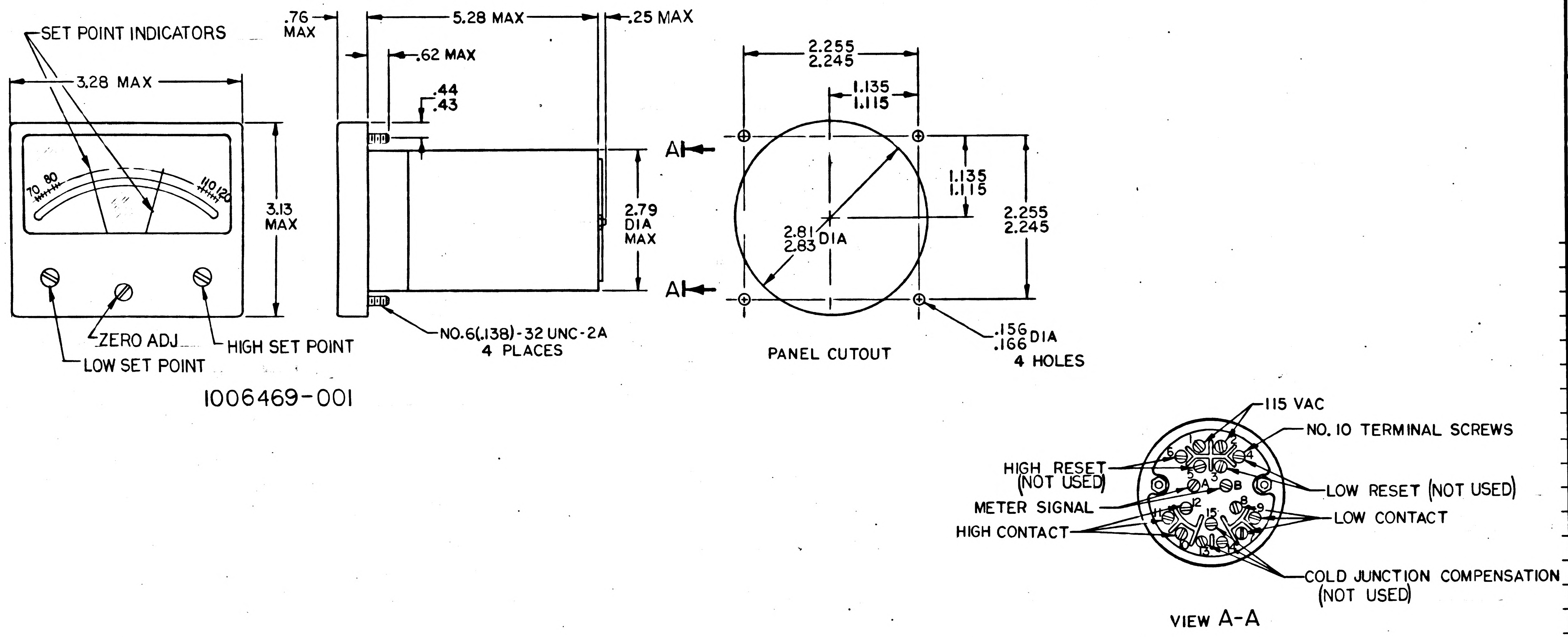
CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006469
SCALE NONE	WT	SHEET 1 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006469

- 1006469

SYM	DESCRIPTION	DATE	APPROVED
	REVISIONS		
0	RELEASED PER CCA R25170	9/14/65	G. Harano
-	RELEASED CLASS A PER TDRR 24524		


SET POINT INDICATORS
3.28 MAX
70 80
110 120
3.13 MAX
ZERO ADJ
HIGH SET POINT
LOW SET POINT
1006469-001
.76 MAX
5.28 MAX
.25 MAX
.62 MAX
.44
.43
2.79 DIA MAX
NO.6(.138)-32 UNC-2A 4 PLACES
A
A
2.255
2.245
1.135
1.115
1.135
1.115
2.255
2.245
2.81
2.83 DIA
.156
.166 DIA 4 HOLES
PANEL CUTOUT
115 VAC
NO. 10 TERMINAL SCREWS
HIGH RESET (NOT USED)
METER SIGNAL
HIGH CONTACT
LOW RESET (NOT USED)
LOW CONTACT
COLD JUNCTION COMPENSATION (NOT USED)
1 2 3 4 5 6 A B 8 9 10 11 12 13 14 15
VIEW A-A

1 | 1006469

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±
DO NOT SCALE DRAWING
MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DATE 13 JUL 65
CHECKED A. Kupa 2 AUG 65
APPROVAL 9/10/65 11/30/65
APPROVAL D. O Bryant 9/10/65
APPROVAL 9/14/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7 Dec 65
MIT APPROVAL G. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

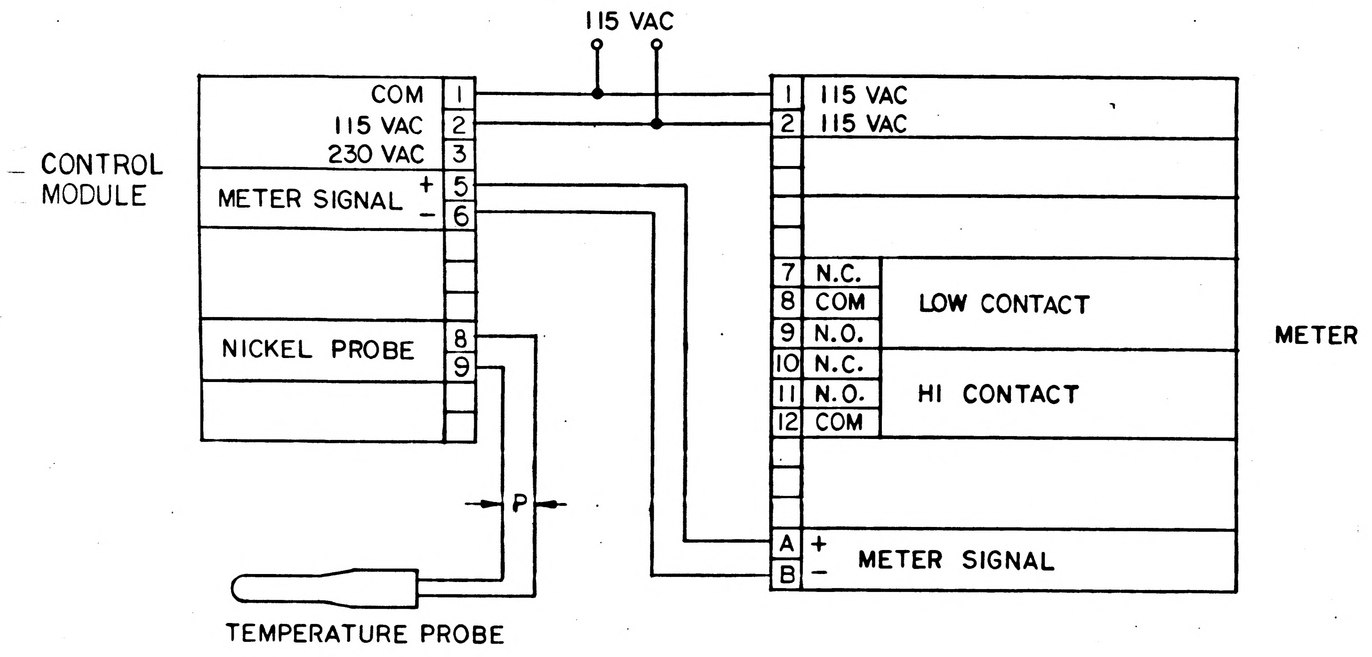
CONTROL ASSEMBLY, TEMPERATURE, INDICATING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006469
SCALE NONE
WT
SHEET 2 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

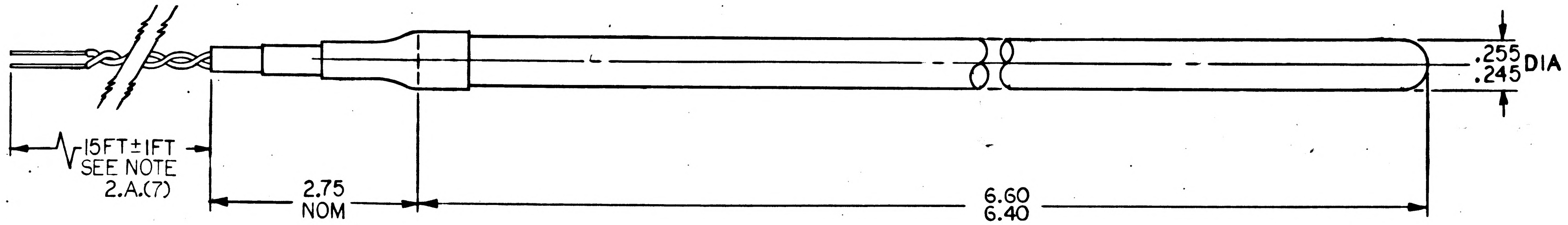
- 1006469

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25170	9/14/65	A. Harano
-	RELEASED CLASS A PER TDRR 24524		



115 VAC
CONTROL MODULE
COM 1
115 VAC 2
230 VAC 3
METER SIGNAL + 5 − 6
NICKEL PROBE 8 9
P
TEMPERATURE PROBE
1 115 VAC
2 115 VAC
7 N.C.
8 COM
9 N.O.
LOW CONTACT
10 N.C.
11 N.O.
12 COM
HI CONTACT
A +
B −
METER SIGNAL
METER

FIG. 1 – SYSTEM WIRING



.255
.245 DIA
15FT±1FT SEE NOTE 2.A.(7)
2.75 NOM
6.60
6.40

1006469-002

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DATE 13 Jul 65
CHECKED A. Kupfer 2 AUG 65
APPROVAL 9/11/65 11/30/65
APPROVAL D. O'Bryant 9/10/65
APPROVAL 9/14/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W Kupfer 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL ASSEMBLY, TEMPERATURE, INDICATING
SPECIFICATION CONTROL DRAWING

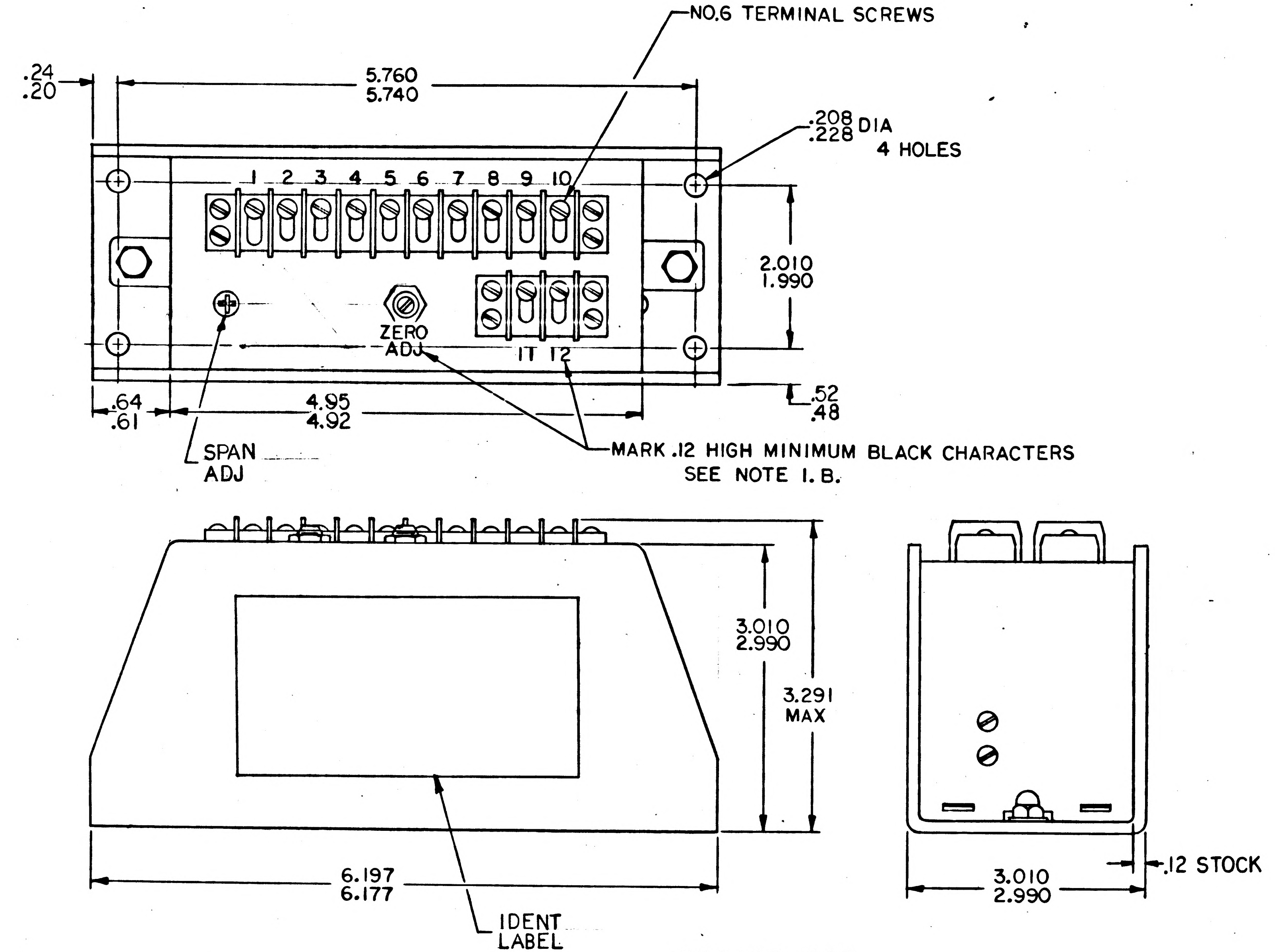
CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006469
SCALE NONE
WT
SHEET 3 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

- 1006469

-	1006469

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25170	9/14/65	G. Harano
-	RELEASED CLASS A PER TDRR 24524		



NO.6 TERMINAL SCREWS
.24
.20
5.760
5.740
.208
.228 DIA
4 HOLES
1 2 3 4 5 6 7 8 9 10
2.010
1.990
ZERO
ADJ
IT 12
.52
.48
.64
.61
4.95
4.92
SPAN
ADJ
MARK .12 HIGH MINIMUM BLACK CHARACTERS
SEE NOTE 1. B.
3.010
2.990
3.291
MAX
6.197
6.177
IDENT
LABEL
3.010
2.990
.12 STOCK

1006469-003

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DATE 13 JUL 65
CHECKED A. Kufer 2 AUG 65
APPROVAL 9/10/65 11/30/65
APPROVAL D. O'Bryant 9/10/65
APPROVAL 9/14/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Harano

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL ASSEMBLY, TEMPERATURE,
INDICATING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006469
SCALE NONE	WT	SHEET 4 OF 4

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25114		
—	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

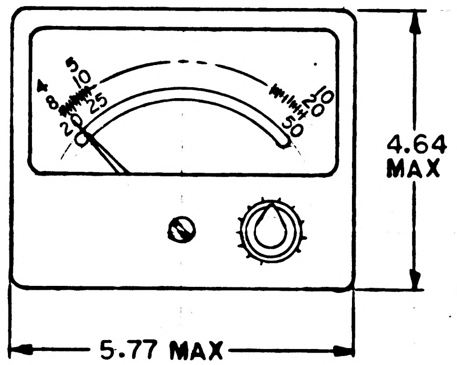
1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR NUMBER, SERIAL NUMBER, AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER. ALL MARKING SHALL APPEAR ON REAR OF UNIT.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
2. ACCEPTANCE AND INSPECTION: 100%
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTE 1.B.
     - (3) INDICATOR SYSTEM: 6 INCH MIRROR SCALE WITH KNIFE-EDGE POINTER.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INPUT IMPEDANCE: 10 MEGOHMS MINIMUM, ALL RANGES.
     - (2) METER ACCURACY: 0.5% OF FULL SCALE, ALL RANGES.
     - (3) MEASUREMENT RANGES: (VRMS FULL SCALE): 0.01, 0.02, 0.05, 0.10, 0.20, 0.50, 1.0, 2.0, 5.0, 10, 20, 50, 100, 200, AND 500. SCALES ARE EXPANDED FOR ACCURACY (4-10, 8-20, & 20-50).
     - (4) FREQUENCY RANGE (FOR 0.5% ACCURACY):

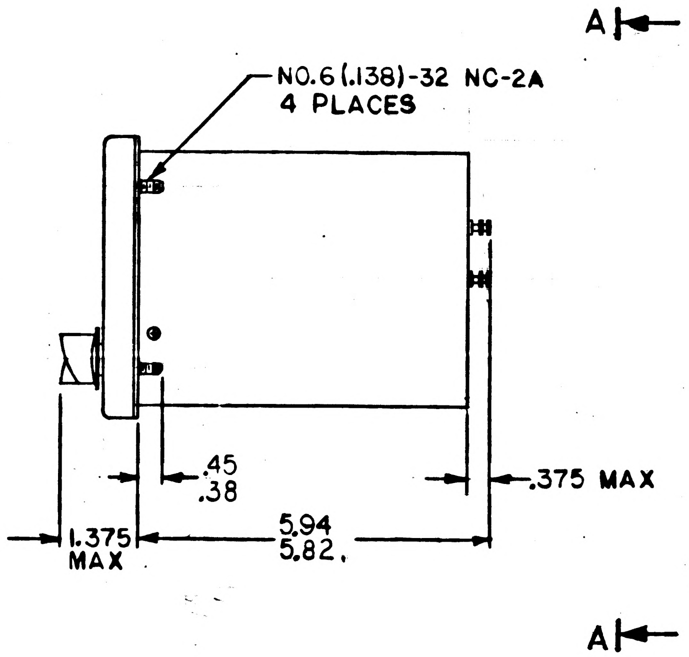
0.01 TO 0.5 V RANGES:	50 CPS TO 50 KC	
1.0 TO 50 V RANGES:	50 CPS TO 20 KC	
100 TO 500 V RANGES:	50 CPS TO 3.0 KC	

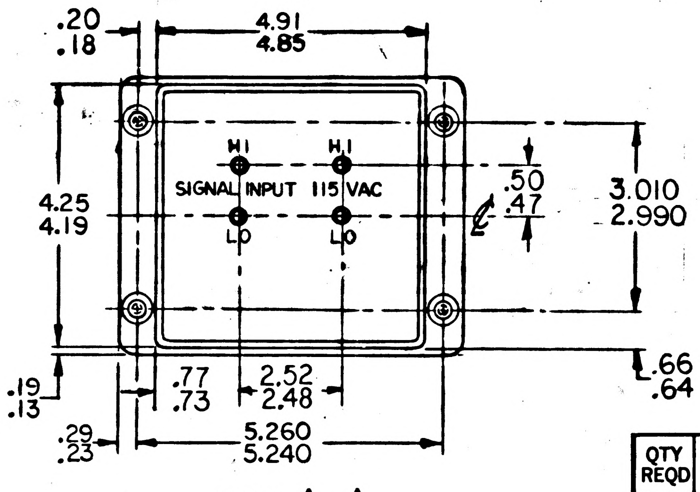
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.
     - (2) TWO (2) COPIES OF OPERATING AND INSTRUCTION MANUAL.
3. DESIGN:
   - A. POWER REQUIREMENTS: 105-125 VRMS, 50-60 CPS, 2 WATTS.
   - B. CONSTRUCTION:
     - (1) METER: ELECTRONIC VOLTMETER
     - (2) POINTER SUSPENSION: TAUT-BAND
     - (3) SCALE: LINEAR
     - (4) SHIELDING: MAGNETIC AND ELECTROSTATIC
     - (5) ISOLATION: SIGNAL ISOLATION FROM POWER AND CHASSIS GROUNDS.
     - (6) TERMINALS: EACH TERMINAL SHALL ACCOMODATE TWO NO. 20 AWG LEADS.
   - C. LIFE EXPECTANCY: 10,000 HOURS.

ORIGINAL SOURCE OF SUPPLY:

TRIO LABORATORIES, INC.
PLAINVIEW, L.I, N. Y.
MODEL 309-2193







VIEW A-A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±   DECIMALS .XXX ±   ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN P. Homme DATE 21 JUN 65
CHECKED E. Urban 26 JUN 65
APPROVAL P. E. Duke 8/20/65 W. L. White 11/29/65
APPROVAL D. O. Bryant 8/20/65
APPROVAL E. A. Loare 20 Aug 65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. J. Cupfer 7 Dec 65
MIT APPROVAL A. Laranzo 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, MULTI-RANGE, AC

SOURCE CONTROL DRAWING

CODE IDENT NO. 49956 | SIZE C | NASA DRAWING NO. 1006473
SCALE NONE | WT | SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

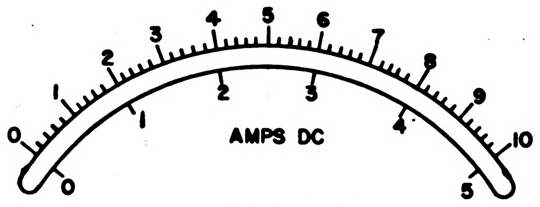
1006475 A

REQUIREMENTS:

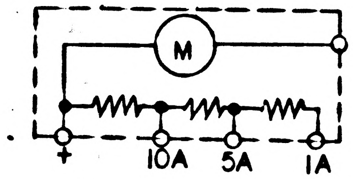
1. GENERAL:
   - A. METERS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-M-16034A EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - C. UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TERMINAL IDENTIFICATION, CALIBRATION LOCATION, LOT NUMBER OR DATE CODE, AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER .
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
     - (2) SHIPPING CONTAINERS SHALL CONTAIN A "DELICATE INSTRUMENT" WARNING LABEL.
2. ACCEPTANCE & INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTE 1.C. AND 1.D.
     - (3) METER FACE: WHITE BACKGROUND WITH BLACK CHARACTERS AND SCALE MARKING.
     - (4) POINTER AND PARALLAX CORRECTION: KNIFEDGE POINTER WITH MIRROR BACKGROUND.
     - (5) SCALE DIVISIONS: 50 DIVISIONS WITH 2 SCALES MARKED LINEARLY FROM 0-5.0 A, AND 0-10 A DC.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) ACCURACY: ±0.5% FULL SCALE
     - (2) SENSITIVITY: 50 MILLIVOLT DROP MAXIMUM
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.
3. DESIGN:
   - A. OPERATING LIFE: 10,000 HOURS MINIMUM.
   - B. STORAGE LIFE: ONE YEAR MINIMUM WITHIN THE RANGE OF THE CALIBRATION ADJUSTMENT TO MAINTAIN INITIAL ACCURACY.
   - C. CONSTRUCTION/TYPE:
     - (1) MOVEMENT: D'ARSONVAL
     - (2) DESIGN FREQUENCY: DC
     - (3) FULL-SCALE RANGES: 3 RANGES (0-1.0A, 0-5.0A, 0-10A) SELF-CONTAINED.
     - (4) TYPE: SWITCHBOARD METER
     - (5) SCALE: 4.01 INCH SCALE AT 90° NOMINAL DEFLECTION
     - (6) DAMPING FACTOR: 1.5 MINIMUM
     - (7) SOLDER LUGS SHALL ACCOMMODATE TWO NO. 20 AWG LEADS.
   - D. ACCESSORIES:
     - (1) MOUNTING CLAMP: STAINLESS STEEL, .025 THK, AS DELINEATED (2 REQD).
     - (2) MOUNTING SCREWS: NO. 6 (.138) - 32UNC2A X .31 LONG (2 REQD).
   - E. TYPE OF MOUNTING: COMPRESSION CLAMPS ON REAR OF METER.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

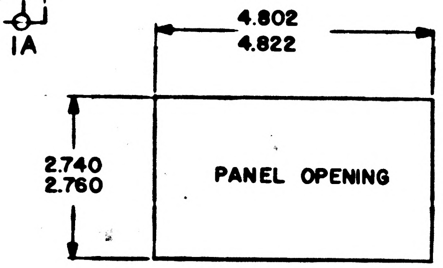
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25098		
1	REVISED PER CCA R25182 DR Ken Budd CHK A. Kupfer APPD		S.H.S.
—	RELEASED CLASS A PER TDRR 24524		
A	CHANGED PER TDRR 24768 DR Ken Budd CHK E Urban APPD	12/3/65	

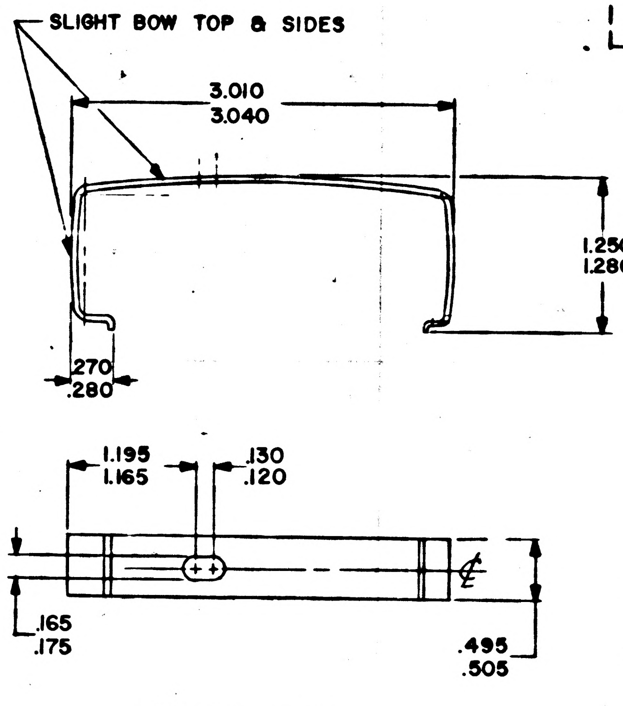


METER SCALE

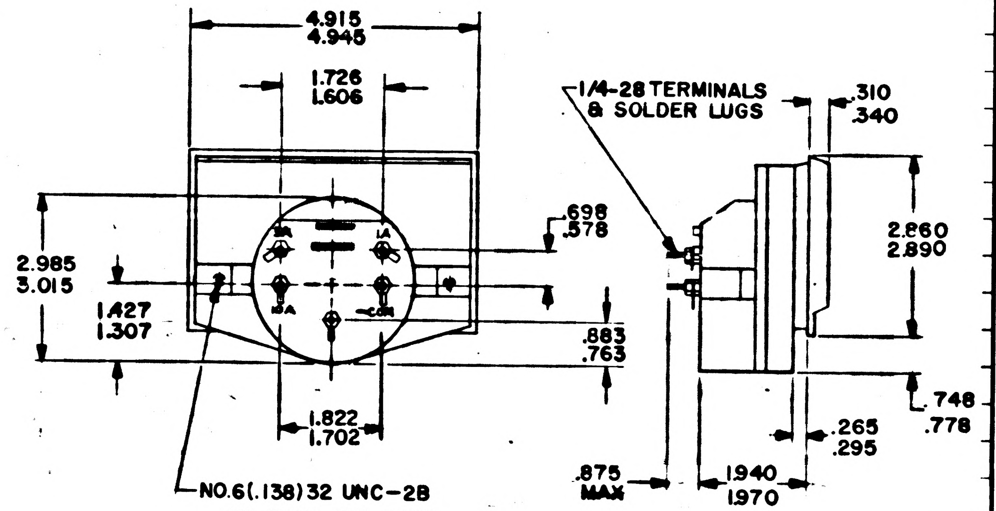


SCHEMATIC





MOUNTING CLAMP



PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN J. DOTY DATE 19 JUN 65
CHECKED E Urban 1 JUL 65
APPROVAL 8/16/65 11/29/65
APPROVAL 8/16/65
APPROVAL 8/17/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL 8/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AMMETER, DC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006475
SCALE NONE
WT
SHEET 1 OF 1

1006475 A

1006475 B

REQUIREMENTS:

1. GENERAL:

   A. METERS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-M-16034A EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   C. UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TERMINAL IDENTIFICATION, CALIBRATION LOCATION, LOT NUMBER OR DATE CODE, AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER .

   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

      (2) SHIPPING CONTAINERS SHALL CONTAIN A "DELICATE INSTRUMENT" WARNING LABEL.

2. ACCEPTANCE & INSPECTION (100%)

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED IN NOTE 1.C. AND 1.D.

      (3) METER FACE: WHITE BACKGROUND WITH BLACK CHARACTERS AND SCALE MARKING.

      (4) POINTER AND PARALLAX CORRECTION: KNIFEDGE POINTER WITH MIRROR BACKGROUND.

      (5) SCALE DIVISIONS: 50 DIVISIONS WITH 2 SCALES MARKED LINEARLY FROM 0-5.0 A, AND 0-10 A DC.

   B. ELECTRICAL CHARACTERISTICS:

      (1) ACCURACY: ±1.0% FULL SCALE

      (2) SENSITIVITY: 50 MILLIVOLT DROP MAXIMUM

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

   A. OPERATING LIFE: 10,000 HOURS MINIMUM.

   B. STORAGE LIFE: ONE YEAR MINIMUM WITHIN THE RANGE OF THE CALIBRATION ADJUSTMENT TO MAINTAIN INITIAL ACCURACY.

   C. CONSTRUCTION/TYPE:

      (1) MOVEMENT: D'ARSONVAL

      (2) DESIGN FREQUENCY: DC

      (3) FULL-SCALE RANGES: 3 RANGES (0-1.0A, 0-5.0A, 0-10A) SELF-CONTAINED.

      (4) TYPE: SWITCHBOARD METER

      (5) SCALE: 4.01 INCH SCALE AT 90° NOMINAL DEFLECTION

      (6) DAMPING FACTOR: 1.5 MINIMUM

      (7) SOLDER LUGS SHALL ACCOMMODATE TWO NO. 20 AWG LEADS.

   D. ACCESSORIES:

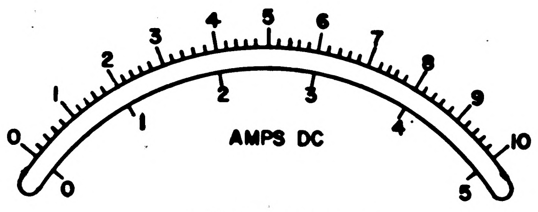
      (1) MOUNTING CLAMP: STAINLESS STEEL, .025 THK, AS DELINEATED (2 REQD).

      (2) MOUNTING SCREWS: NO. 6 (.136) - 32UNC2A X .31 LONG (2 REQD).

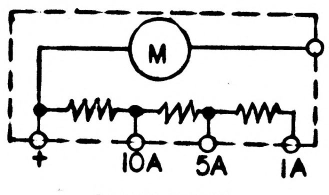
   E. TYPE OF MOUNTING: COMPRESSION CLAMPS ON REAR OF METER.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

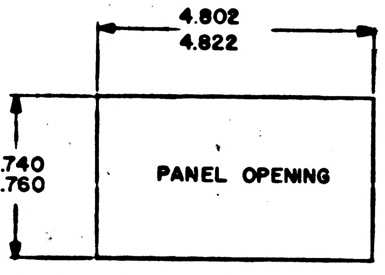
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25098		
1	REVISED PER CCA R25182 DR Ken Budd CHK APPD		S.H.S.
—	RELEASED CLASS A PER TDRR 24524		
A	CHANGED PER TDRR 24768 DR Ken Budd CHK E Urban APPD	12/30/65	
B	CHANGED PER TDRR 25919 DR CHK APPD R.E.D.	2/15/66	

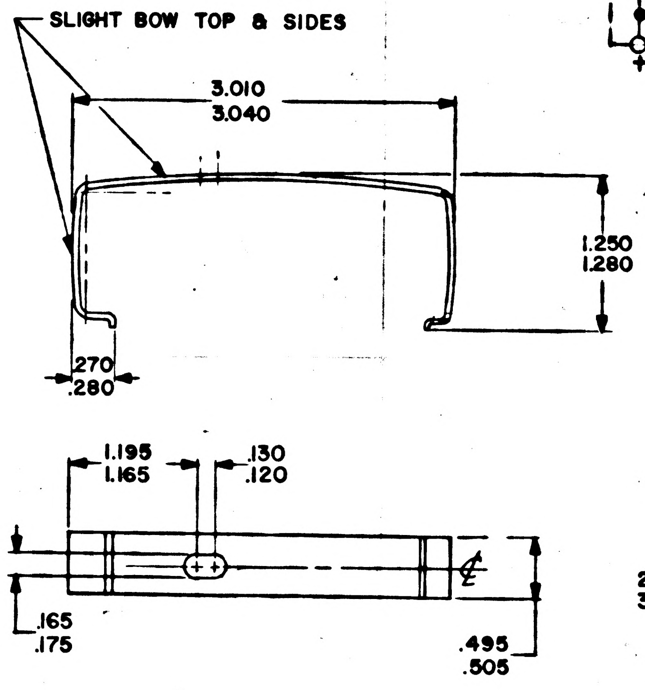


METER SCALE

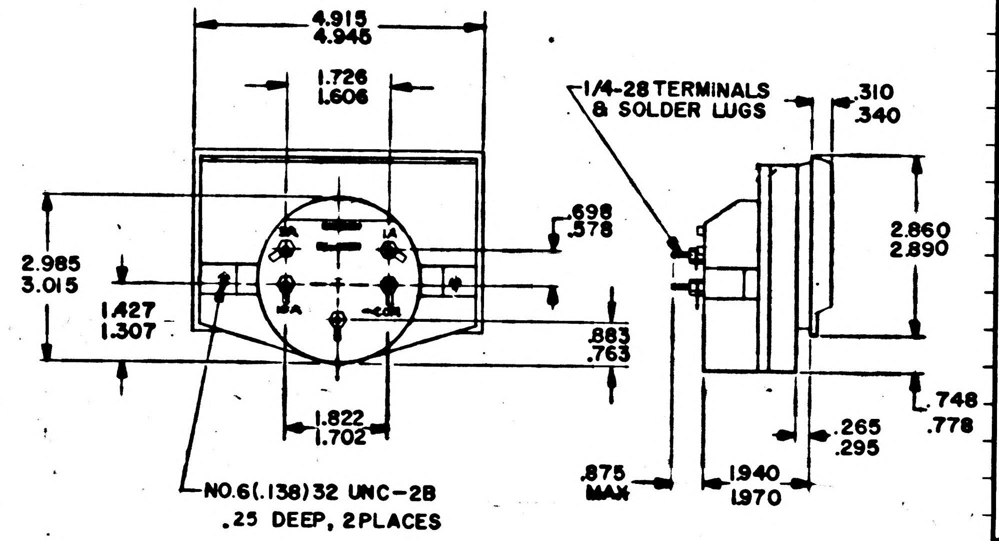


SCHEMATIC





MOUNTING CLAMP



1006475 B

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN J. DOTY DATE 9 JUN 65
CHECKED E Urban 13 JUL 65
APPROVAL 8/16/65 11/29/65
APPROVAL 8/16/65
APPROVAL 8/17/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7/26/65
MIT APPROVAL 8/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AMMETER, DC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006475
SCALE NONE
WT
SHEET 1 OF 1

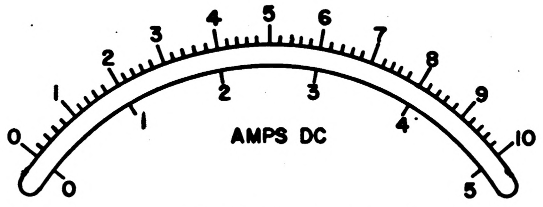
–	1006475

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25098		
1	REVISED PER CCA R25182 DR Ken Budd CHK A. Kupfer APPD	5 Oct 65	S.H.S.
—	RELEASED CLASS A PER TDRR 24524		

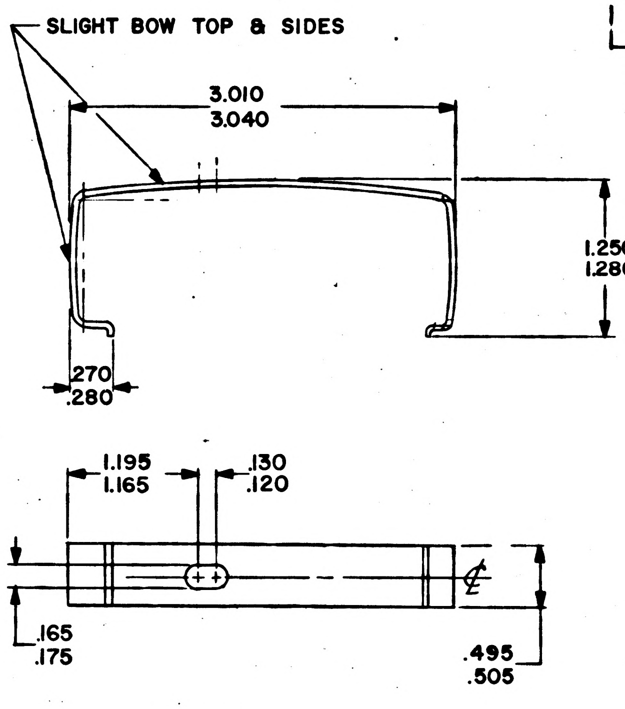
REQUIREMENTS:

1. GENERAL:
   - A. METERS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-M-16034A EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - C. UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TERMINAL IDENTIFICATION, CALIBRATION LOCATION, LOT NUMBER OR DATE CODE, AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER .
   - D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
     - (2) SHIPPING CONTAINERS SHALL CONTAIN A "DELICATE INSTRUMENT" WARNING LABEL.
2. ACCEPTANCE & INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTE 1.C. AND 1.D.
     - (3) METER FACE: WHITE BACKGROUND WITH BLACK CHARACTERS AND SCALE MARKING.
     - (4) POINTER AND PARALLAX CORRECTION: KNIFEDGE POINTER WITH MIRROR BACKGROUND.
     - (5) SCALE DIVISIONS: 50 DIVISIONS WITH 2 SCALES MARKED LINEARLY FROM 0-5.0 A, AND 0-10 A DC.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) ACCURACY: ±0.5% FULL SCALE
     - (2) SENSITIVITY: 50 MILLIVOLT DROP MAXIMUM
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.
3. DESIGN:
   - A. OPERATING LIFE: 10,000 HOURS MINIMUM.
   - B. STORAGE LIFE: ONE YEAR MINIMUM WITHIN THE RANGE OF THE CALIBRATION ADJUSTMENT TO MAINTAIN INITIAL ACCURACY.
   - C. CONSTRUCTION/TYPF:
     - (1) MOVEMENT: D'ARSONVAL
     - (2) DESIGN FREQUENCY: DC
     - (3) FULL-SCALE RANGES: 3 RANGES (0-1.0A, 0-5.0A, 0-10A) SELF-CONTAINED.
     - (4) TYPE: SWITCHBOARD METER
     - (5) SCALE: 4.01 INCH SCALE AT 90° NOMINAL DEFLECTION
     - (6) DAMPING FACTOR: 1.5 MINIMUM
     - (7) SOLDER LUGS SHALL ACCOMMODATE TWO NO. 20 AWG LEADS.
   - D. ACCESSORIES:
     - (1) MOUNTING CLAMP: STAINLESS STEEL, .025 THK, AS DELINEATED (2 REQD).
     - (2) MOUNTING SCREWS: NO. 6 (.138) - 32UNC2A X .31 LONG (2 REQD).
   - E. TYPE OF MOUNTING: COMPRESSION CLAMPS ON REAR OF METER.

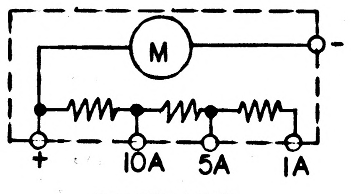
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



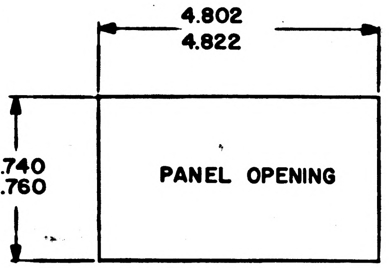
METER SCALE

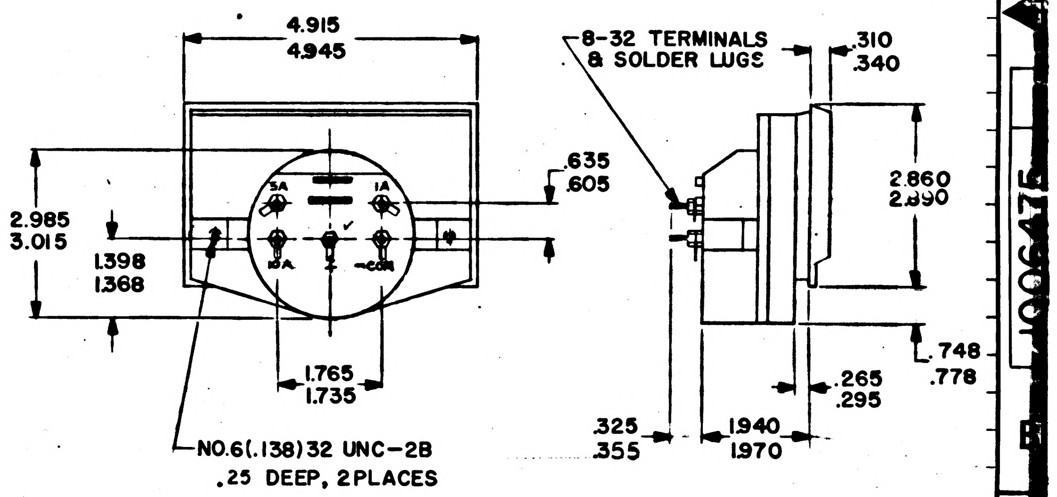


MOUNTING CLAMP



SCHEMATIC





MASTER

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

SEE NOTE

RAYTHEON	RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS9-497	
DRAWN J. DOTY VMS	DATE 19 JUN 65
CHECKED E. Urban 1 JUL 65	
APPROVAL E. E. Butt 8/16/65	W. White 11/29/65
APPROVAL D. O'Bryant 8/16/65	
APPROVAL W. J. Bruno 8/17/65	
NASA APPROVAL A. C. METZGER	
MIT APPROVAL W. Kupfer 7 Dec 65	
MIT APPROVAL A. Harano 12/6/65	

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AMMETER, DC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006475
SCALE NONE	WT	SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25343	10/21/65	A. Harano
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26233 DR J.P. Leonard CHK R.E. [illegible] APPD H. Maynard		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   B. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN

      (2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.

      (3) SWITCH ACTION: SWITCHES SHALL HAVE A DEFINITE DETENT ACTION IN EACH OF 10 POSITIONS. FORCE REQUIRED TO SWITCH SHALL BE 7-11 OUNCES AT THE THUMBWHEEL.

      (4) DIAL MARKING: SEQUENTIAL MARKING, 0, 1, 2, 3, 4, 5, 6, 7, X, X ON EACH SWITCH.

   B. ELECTRICAL CHARACTERISTICS:

      (1) SWITCH CONNECTION: SEE TABLE II.

      (2) INSULATION RESISTANCE: 500 MEGOHMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

      (3) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.

      (4) CONTACT RESISTANCE: 100 MILLIOHMS WITH A CURRENT OF 10 MILLIAMPERES FLOWING.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

   A. OPERATING LIFE: 100,000 CYCLES MINIMUM AT NO LOAD AND 25,000 CYCLES MINIMUM UNDER A 12 WATT NON-INDUCTIVE LOAD. A CYCLE IS DEFINED AS ONE COMPLETE ROTATION. ROTATIONAL TORQUE SHALL CHANGE LESS THAN ± 25% AFTER LIFE TEST.

   B. CONSTRUCTION:

      (1) PLASTIC PARTS: THE SWITCH BODIES, THUMBWHEELS, END BRACKETS, AND SPACERS SHALL BE GREY POLYCARBONATE PLASTIC. NUMERALS ON THE THUMBWHEELS SHALL BE HOT-STAMPED BLACK CHARACTERS (.235 HIGH BY .156 WIDE).

      (2) CIRCUIT BOARD: .062 EPOXY GLASS PER MIL-P-13949, TYPE GE, PLATED CIRCUIT ON TWO SIDES.

      (3) ASSEMBLIES: SWITCHES, SPACERS, AND END BRACKETS SHALL NEST TOGETHER WITH TABS AND RECESSES TO PREVENT ROTATION AND SHALL BE SECURED TOGETHER WITH POST SPACERS AND SCREWS. SCREWS SHALL BE REMOVABLE FOR REPLACEMENT OF PARTS. TERMINALS SHALL BE PRECISION METAL PRODUCTS CO. PART NO. ID3-8B OR EQUIVALENT.

   C. CONTACT RATINGS:

      (1) VOLTAGE: 200 VOLTS DC.

      (2) CURRENT: 3.0 AMPERES DC NON-SWITCHING
      12 WATTS NON-INDUCTIVE SWITCHING

TABLE I

DASH NO.	DESCRIPTION
-001	SWITCH MODULE
-002	~~1/2 MODULE SPACER~~
-003	SPACER MODULE
-004	ASSEMBLY, 6 DIGIT
-005	ASSEMBLY, 8 DIGIT
-006	ASSEMBLY, 10 DIGIT
-007	LEFT HAND END CAP
-008	RIGHT HAND END CAP

TABLE II

DIAL READING	DIAL LOGIC POSITION	COMMON C1 CONNECTED TO TERMINAL		COMMON C2 CONNECTED TO TERMINAL		COMMON C4 CONNECTED TO TERMINAL	
		1	$\bar{1}$	2	$\bar{2}$	4	$\bar{4}$
0	0		*		*		*
1	1	*			*		*
2	2		*	*			*
3	3	*		*			*
4	4		*		*	*	
5	5	*			*	*	
6	6		*	*		*	
7	7	*		*		*	
X	X						
X	X						

X = DON'T CARE POSITION

* = LOGIC CONDITION

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497

DRAWN J. Doty DATE 27 Jul 65
CHECKED 5 Oct 65
APPROVAL 10/13/65
APPROVAL 10/15/65
APPROVAL 10/6/65
NASA APPROVAL A. C. METZGER 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, BINARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006478
SCALE NONE
WT
SHEET 1 OF 3

1006478 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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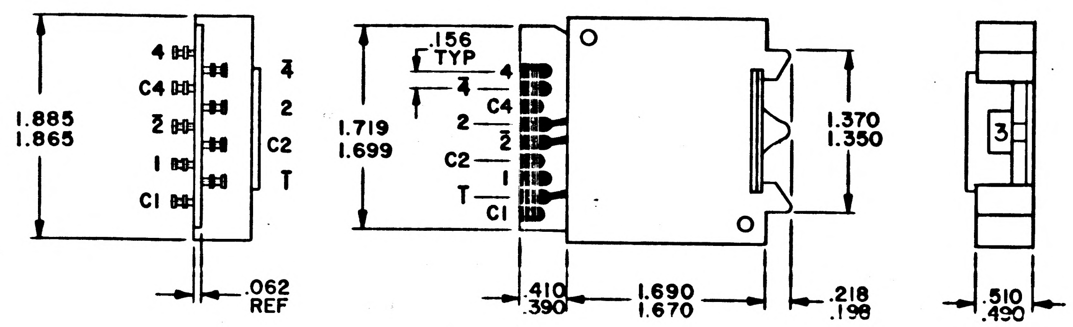
REVISIONS

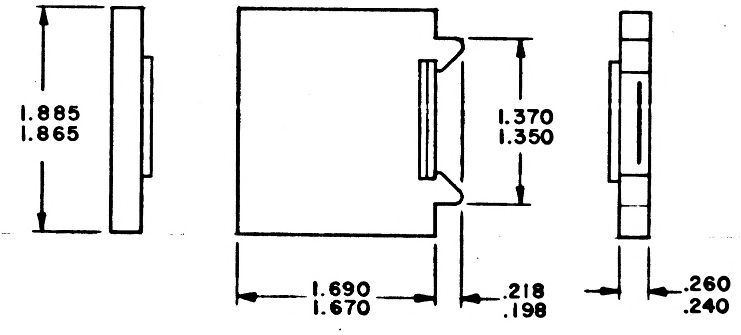
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25343	10/24/65	A. Harano
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26233 DR J.P. Leonard CHK R. Edwards APPD H. Maynard		

-001 SWITCH MODULE



4
C4
2̄
1
C1
4̄
2
C2
T
1.885
1.865
.062
REF
.156
TYP
4̄
C4
2
2̄
C2
1
T
C1
1.719
1.699
.410
.390
1.690
1.670
1.370
1.350
.218
.198
3
.510
.490

-002 1/2 MODULE SPACER



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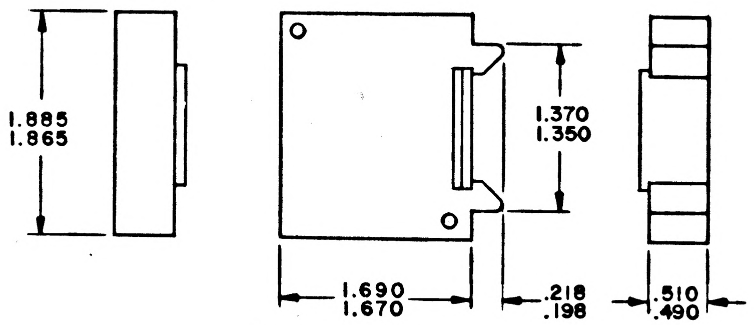
1.370
1.350
1.690
1.670
.218
.198
.260
.240

-003 SPACER MODULE.



1.885
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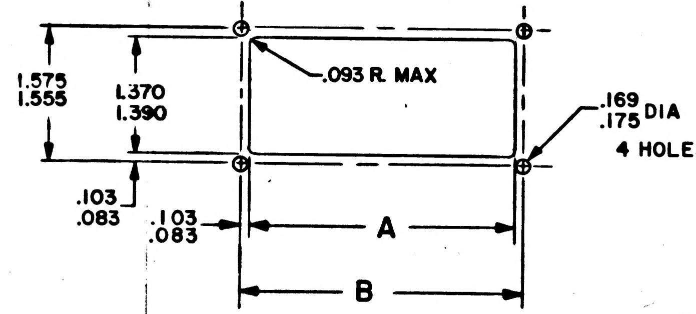
1.370
1.350
1.690
1.670
.218
.198
.510
.490

PANEL CUTOUT



.093 R. MAX
1.575
1.555
1.370
1.390
.169
.175 DIA
4 HOLES
.103
.083
.103
.083
A
B

DASH NO.	A	B	C
-004	3.380 3.400	3.585 3.565	4.21 3.61
-005	4.880 4.900	5.085 5.065	5.71 5.11
-006	5.880 5.900	6.085 6.065	6.71 6.11

1006478 A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497

DRAWN H. Wong DATE 4 Aug 65
CHECKED 3 Oct 65
APPROVAL 10/15/65
APPROVAL D. J. Bryant 10/15/65
APPROVAL 10/15/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, BINARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006478
SCALE NONE
WT
SHEET 2 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

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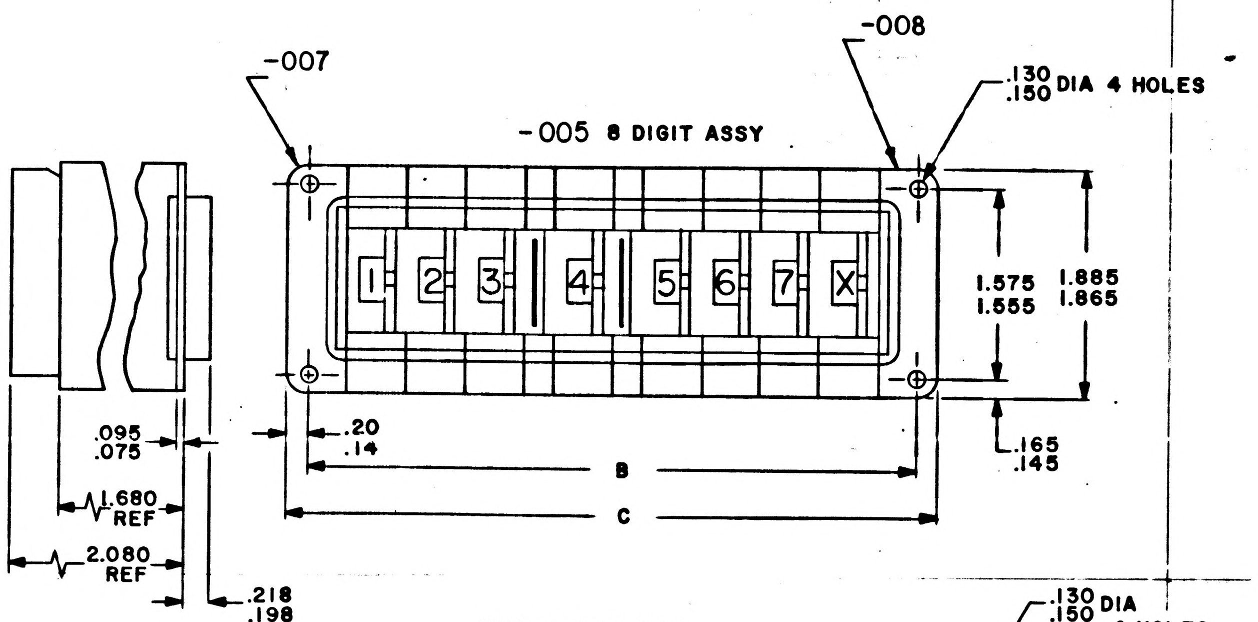
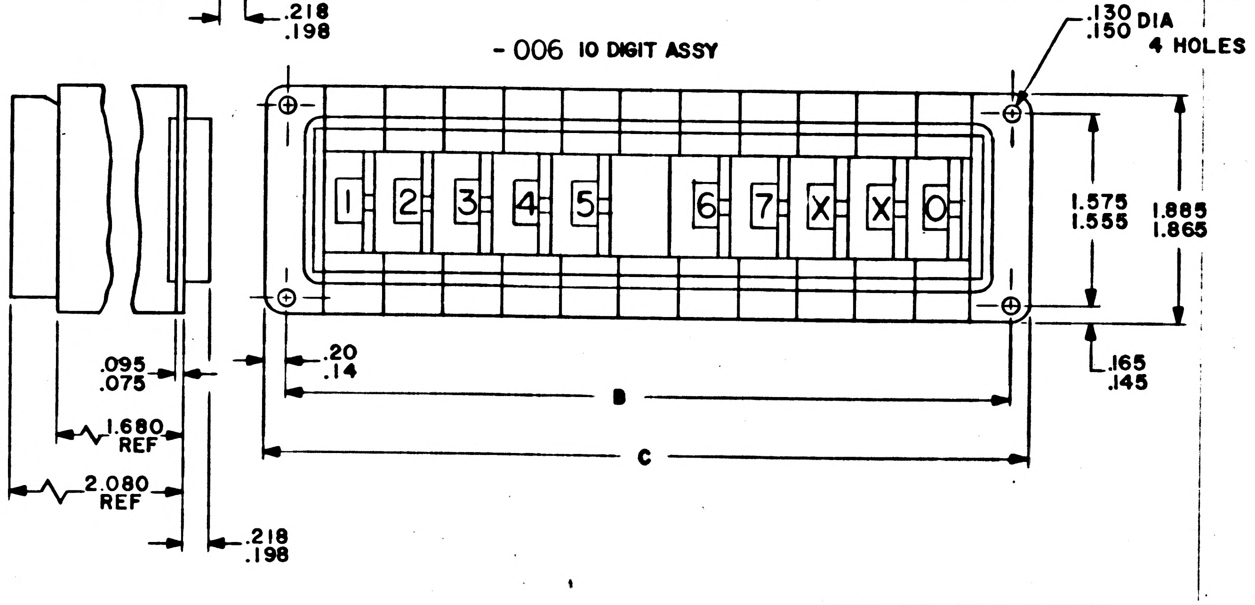
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25343	10/21/65	A. Harano
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 26233 DR J.P. Leonard CHK R. Edwards APPD H Maynard		



-007
-008
-005 8 DIGIT ASSY
.130 .150 DIA 4 HOLES
1 2 3 4 5 6 7 X
1.575 1.555
1.885 1.865
.095 .075
.20 .14
.165 .145
B
C
1.680 REF
2.080 REF
.218 .198



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1 2 3 4 5 6 7 X X 0
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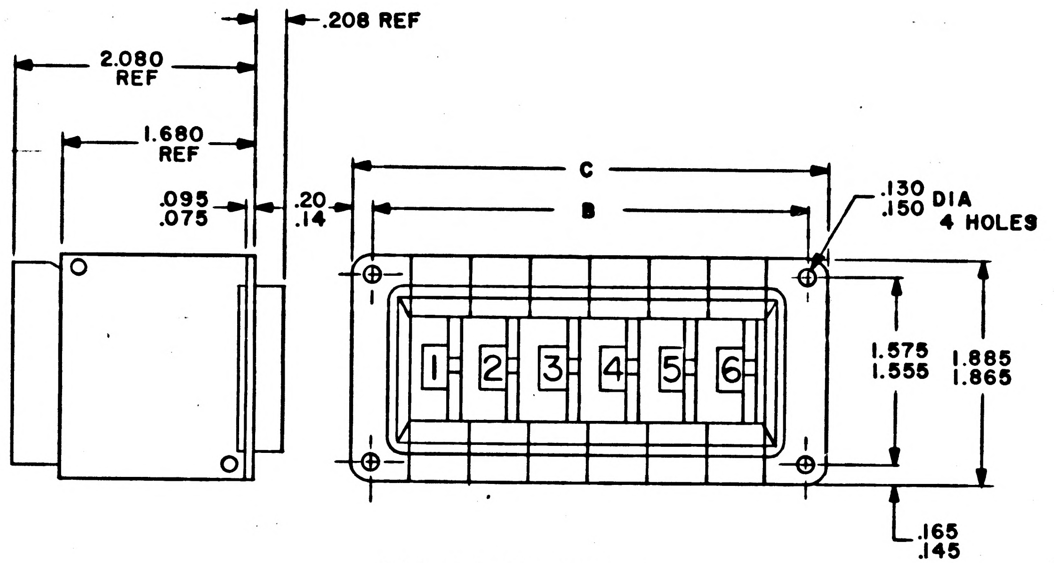
1.885 1.865
.095 .075
.20 .14
.165 .145
B
C
1.680 REF
2.080 REF
.218 .198



.208 REF
2.080 REF
1.680 REF
.095 .075
.20 .14
C
B
.130 .150 DIA 4 HOLES
1 2 3 4 5 6
1.575 1.555
1.885 1.865
.165 .145

-004 6 DIGIT ASSY

1006478 A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY	USED ON
APPLICATION	

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DATE 30 SEP 65
CHECKED [illegible] 30 Oct 65
APPROVAL [illegible] 10/15/65
APPROVAL B. O[illegible] 10/15/65
APPROVAL [illegible] 10/1/65
NASA APPROVAL ~~A. C. METZGER~~ W Kupferdale
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, BINARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006478
SCALE NONE
WT
SHEET 3 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25343	10/21/65	A. Harano
—	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   B. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN
      (2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.
      (3) SWITCH ACTION: SWITCHES SHALL HAVE A DEFINITE DETENT ACTION IN EACH OF 10 POSITIONS. FORCE REQUIRED TO SWITCH SHALL BE 7-11 OUNCES AT THE THUMBWHEEL.
      (4) DIAL MARKING: SEQUENTIAL MARKING, 0, 1, 2, 3, 4, 5, 6, 7, X, X ON EACH SWITCH.

   B. ELECTRICAL CHARACTERISTICS:

      (1) SWITCH CONNECTION: SEE TABLE II.
      (2) INSULATION RESISTANCE: 500 MEGOHMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.
      (3) DIELECTRIC WITHSTANDING VOLTAGE: 1250 VOLTS RMS MINIMUM BETWEEN ALL MUTUALLY INSULATED TERMINALS.
      (4) CONTACT RESISTANCE: 100 MILLIOHMS WITH A CURRENT OF 10 MILLIAMPERES FLOWING.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

   A. OPERATING LIFE: 100,000 CYCLES MINIMUM AT NO LOAD AND 25,000 CYCLES MINIMUM UNDER A 12 WATT NON-INDUCTIVE LOAD. A CYCLE IS DEFINED AS ONE COMPLETE ROTATION. ROTATIONAL TORQUE SHALL CHANGE LESS THAN ± 25% AFTER LIFE TEST.

   B. CONSTRUCTION:

      (1) PLASTIC PARTS: THE SWITCH BODIES, THUMBWHEELS, END BRACKETS, AND SPACERS SHALL BE GREY POLYCARBONATE PLASTIC. NUMERALS ON THE THUMBWHEELS SHALL BE HOT-STAMPED BLACK CHARACTERS (.235 HIGH BY .156 WIDE).
      (2) CIRCUIT BOARD: .062 EPOXY GLASS PER MIL-P-13949, TYPE GE, PLATED CIRCUIT ON TWO SIDES.
      (3) ASSEMBLIES: SWITCHES, SPACERS, AND END BRACKETS SHALL NEST TOGETHER WITH TABS AND RECESSES TO PREVENT ROTATION AND SHALL BE SECURED TOGETHER WITH POST SPACERS AND SCREWS. SCREWS SHALL BE REMOVABLE FOR REPLACEMENT OF PARTS. TERMINALS SHALL BE PRECISION METAL PRODUCTS CO. PART NO. 1D3-8B OR EQUIVALENT.

   C. CONTACT RATINGS:

      (1) VOLTAGE: 200 VOLTS DC.
      (2) CURRENT: 3.0 AMPERES DC NON-SWITCHING
      12 WATTS NON-INDUCTIVE SWITCHING

TABLE I

DASH NO.	DESCRIPTION
-001	SWITCH MODULE
-002	1/2 MODULE SPACER
-003	SPACER MODULE
-004	ASSEMBLY, 6 DIGIT
-005	ASSEMBLY, 8 DIGIT
-006	ASSEMBLY, 10 DIGIT
-007	LEFT HAND END CAP
-008	RIGHT HAND END CAP

TABLE II

DIAL READING	DIAL LOGIC POSITION	COMMON C1 CONNECTED TO TERMINAL		COMMON C2 CONNECTED TO TERMINAL		COMMON C4 CONNECTED TO TERMINAL	
		1	$\overline{1}$	2	$\overline{2}$	4	$\overline{4}$
0	0		*		*		*
1	1	*			*		*
2	2		*	*			*
3	3	*		*			*
4	4		*		*	*	
5	5	*			*	*	
6	6		*	*		*	
7	7	*		*		*	
X	X						
X	X						

X = DON'T CARE POSITION

* = LOGIC CONDITION

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497

DRAWN J. Doty DATE 27 Jul 65
CHECKED 5 Oct 65
APPROVAL 10/15/65
APPROVAL D. O'Bryant 10/15/65
APPROVAL 10/1/65
NASA APPROVAL A. C. METZGER
7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, BINARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006478
SCALE NONE
WT
SHEET 1 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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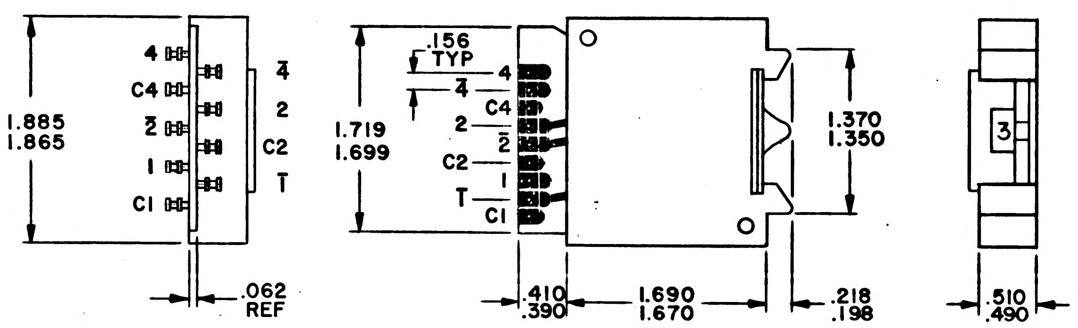
REVISIONS

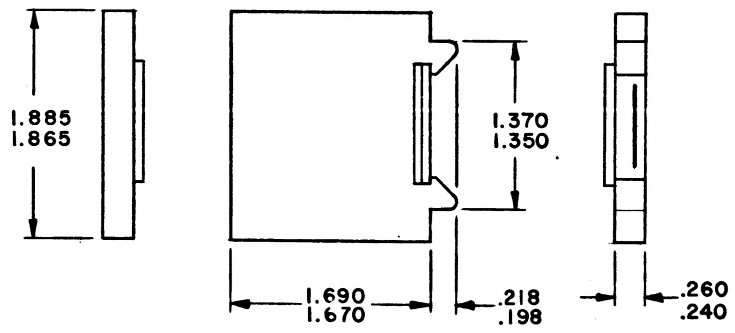
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25343	10/21/65	A. Harano
—	RELEASED CLASS A PER TDRR 24524		

-001 SWITCH MODULE



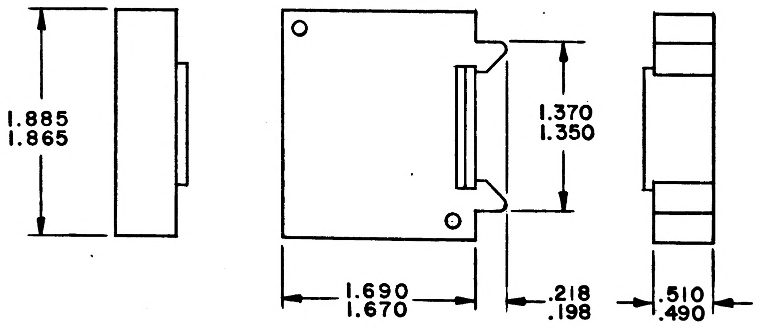
4
C4
$\bar{2}$
1
C1
$\bar{4}$
2
C2
T
1.885
1.865
.062 REF
.156 TYP
4
$\bar{4}$
C4
2
C2
$\bar{2}$
T
1
C1
1.719
1.699
.410
.390
1.690
1.670
1.370
1.350
.218
.198
3
.510
.490

-002 1/2 MODULE SPACER



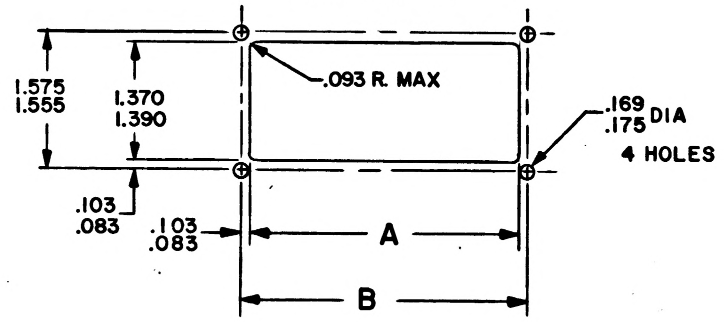
1.885
1.865
1.370
1.350
1.690
1.670
.218
.198
.260
.240

-003 SPACER MODULE.



1.885
1.865
1.370
1.350
1.690
1.670
.218
.198
.510
.490

PANEL CUTOUT



.093 R. MAX
1.575
1.555
1.370
1.390
.169
.175 DIA
4 HOLES
.103
.083
.103
.083
A
B

DASH NO.	A	B	C
-004	3.380 3.400	3.585 3.565	4.21 3.61
-005	4.880 4.900	5.085 5.065	5.71 5.11
-006	5.880 5.900	6.085 6.065	6.71 6.11

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DATE 4 Aug 65
CHECKED 3 Oct 65
APPROVAL 10/15/65
APPROVAL 10/15/65
APPROVAL 10/21/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, BINARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006478
SCALE NONE
WT
SHEET 2 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION. THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER: AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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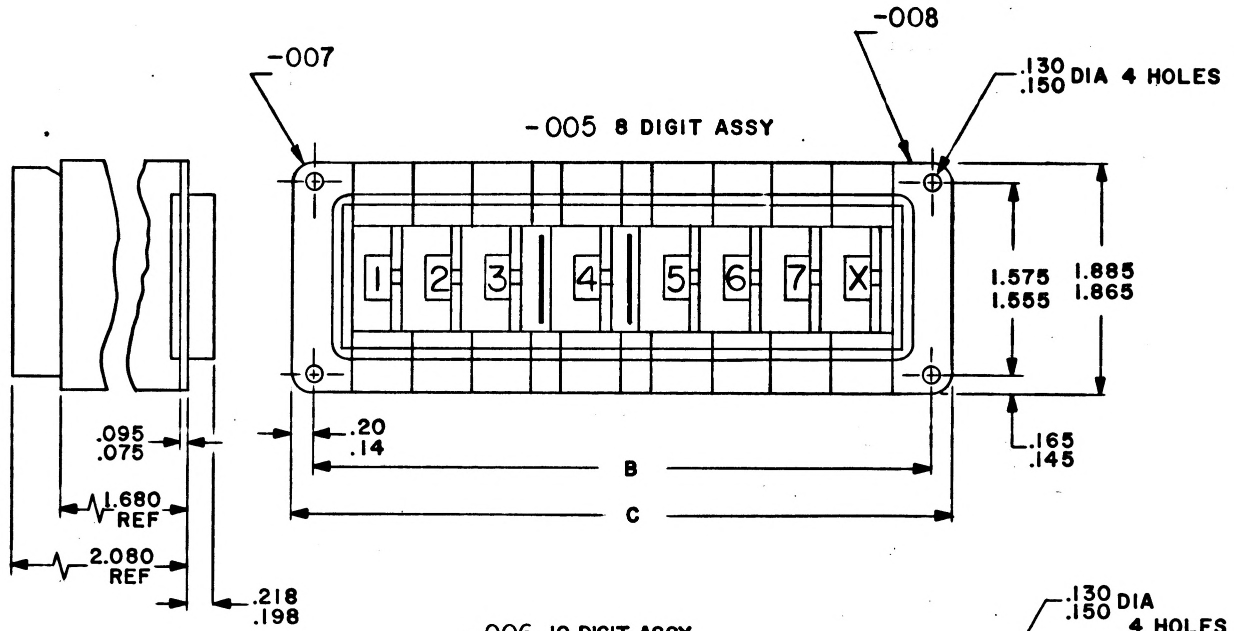
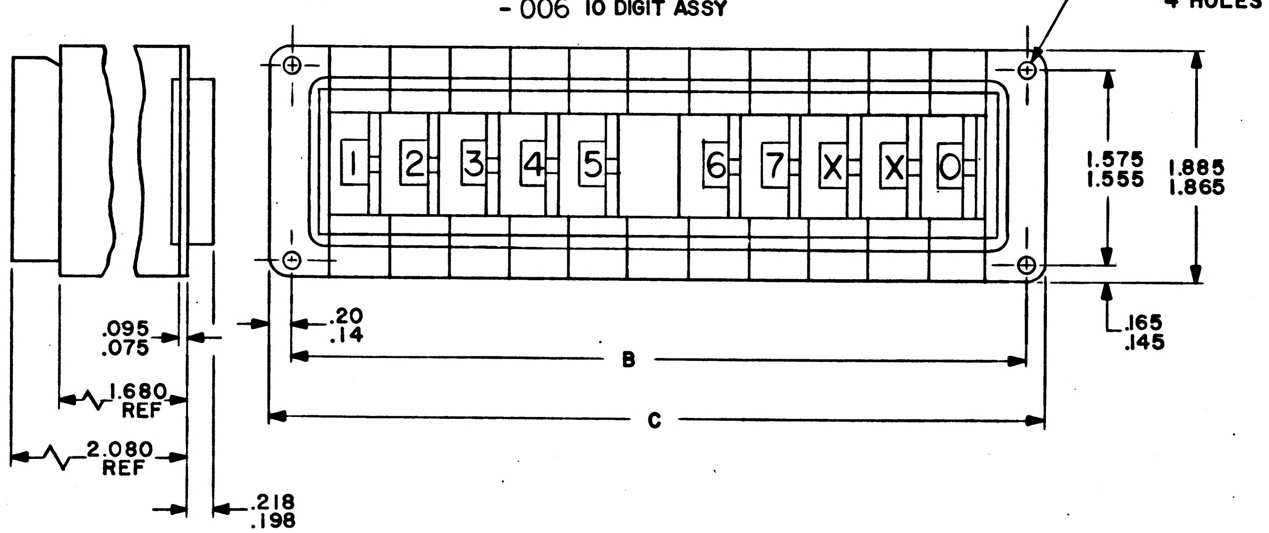
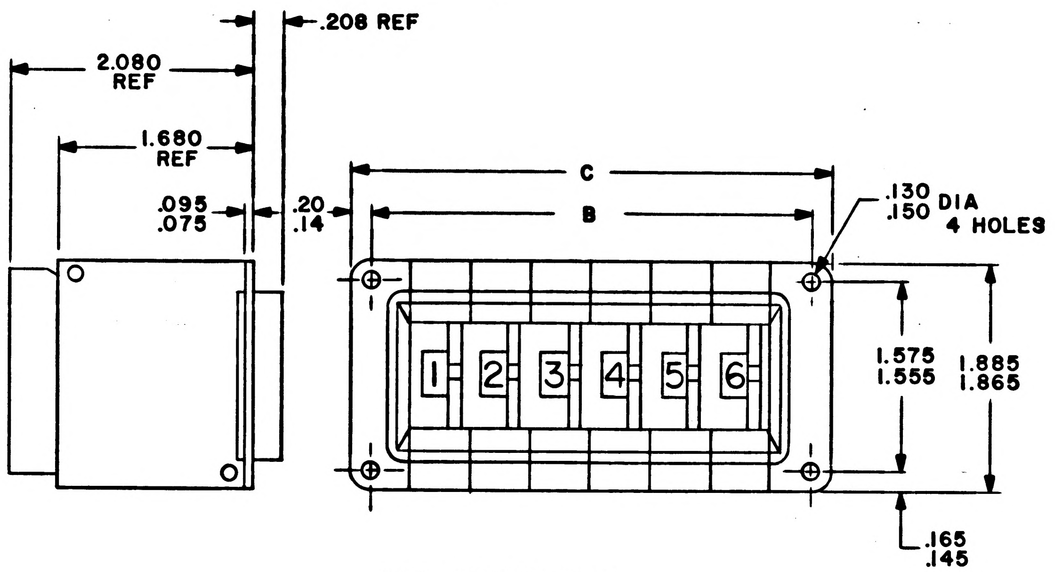
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25343	10/21/65	A. Harano
—	RELEASED CLASS A PER TDRR 24524		


-007
-008
-005 8 DIGIT ASSY
.130 .150 DIA 4 HOLES
1 2 3 4 5 6 7 X
1.575 1.555
1.885 1.865
.165 .145
.095 .075
.20 .14
B
C
1.680 REF
2.080 REF
.218 .198


-006 10 DIGIT ASSY
.130 .150 DIA 4 HOLES
1 2 3 4 5 6 7 X X 0
1.575 1.555
1.885 1.865
.165 .145
.095 .075
.20 .14
B
C
1.680 REF
2.080 REF
.218 .198


.208 REF
2.080 REF
1.680 REF
.095 .075
.20 .14
C
B
.130 .150 DIA 4 HOLES
1 2 3 4 5 6
1.575 1.555
1.885 1.865
.165 .145

-004 6 DIGIT ASSY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497

DRAWN H. Wong DATE 30 SEP 65
CHECKED 5 Oct 65
APPROVAL 10/15/65
APPROVAL D. O'Bryant 10/15/65
APPROVAL B. 10/16/65
NASA APPROVAL ~~A. C. METZGER~~ W. 12/6/65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, BINARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006478
SCALE NONE	WT	SHEET 3 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

1006481 A

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25203	9/23/65	A. Havano
1	CHANGED PER CCA R25476 DR P. Brown CHK S. Schmidt APPD A. Maynard	11/15/65	S. L. Smith
-	RELEASED CLASS A PER TDRR 24524		
A	CHANGED PER TDRR 24763 DR BR Fuller CHK J. Yon APPD D. M. Sleeper	12/30/65	

REQUIREMENTS:

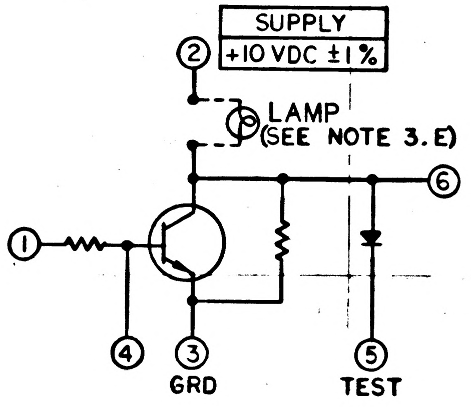
1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - B. PART MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE I.
     - (1) MARKING OF UNIT PACKAGES AND THE METHODS OF MARKING SHALL BE AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.
     - (3) TERMINALS: EACH TERMINAL SHALL ACCOMMODATE TWO (2) NO. 20 AWG LEADS.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INTERNAL CIRCUITRY: SEE FIGURE I. CHECK INPUT VOLTAGE AND CURRENT WITH LAMP AND LENS CAP PER NOTE 3.E.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:
   - A. OPERATING LIFE: 20,000 HOURS MINIMUM WHEN OPERATED WITHIN DESIGN PARAMETERS WITH THE LAMP AND LENS SPECIFIED BELOW ON A 50% "ON" 50% "OFF" BASIS.
   - B. CONSTRUCTION:
     - (1) MATERIALS & FINISHES:
       - (a) CASE AND FLANGE NUT: ALUMINUM, BLACK ANODIZED.
       - (b) TERMINALS: BRASS WITH GOLD ELECTROPLATE OVER NICKEL FLASH.
       - (c) HEADER: DIALLYL PHTHALATE PER MIL-M-14F TYPE SDG-F.
   - C. OPERATING CONDITIONS: SEE FIGURE I.
   - D. OPERATING AMBIENT TEMPERATURE RANGE: +10°C TO +60°C.
   - E. ACCESSORY PARTS: (NOT SUPPLIED)
     - (1) LAMP: NASA PART NO. 1006407-002.
     - (2) LENS CAP: NASA PART NO. 1006401-005.

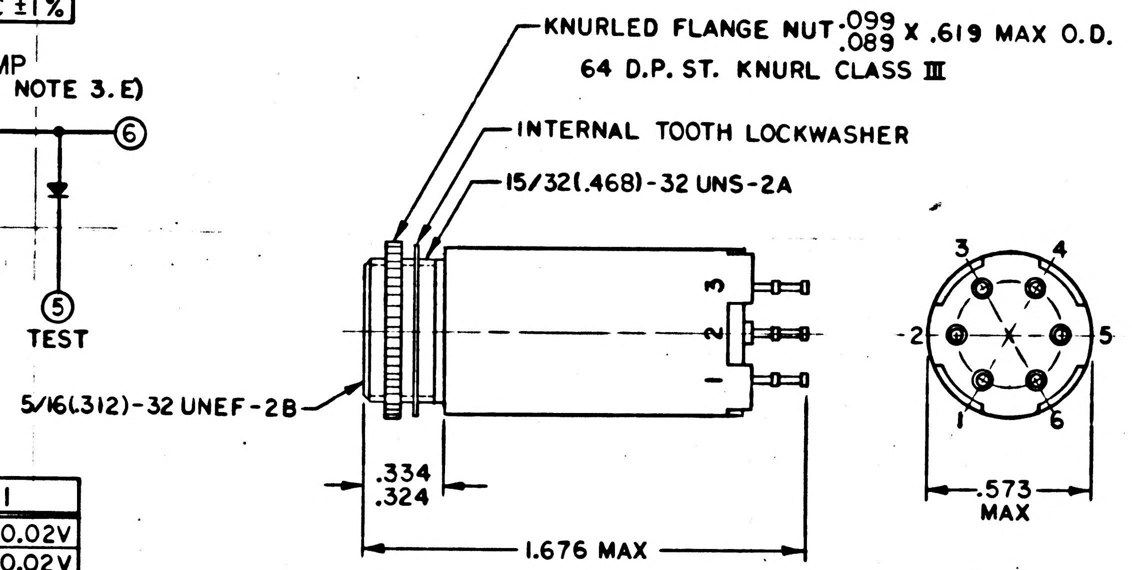
PROCURE ONLY FROM APPROVED SOURCES LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



INPUT AT TERM. I	
LIGHT ON	0.80±0.02V
LIGHT OFF	0.40±0.02V
SIGNAL CURRENT	1.2 MA MAX

FIGURE I — SCHEMATIC


KNURLED FLANGE NUT $^{.099}_{.089}$ X .619 MAX O.D.
64 D.P. ST. KNURL CLASS III
INTERNAL TOOTH LOCKWASHER
15/32(.468)-32 UNS-2A
5/16(.312)-32 UNEF-2B
3
2
1
.334
.324
1.676 MAX
3
4
2
5
1
6
.573
MAX

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS 9-497
DRAWN H. Wong DATE 1 Aug 65
CHECKED E. Urban 9 AUG 65
APPROVAL 15 Sep 65
APPROVAL
APPROVAL 9/13/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT, INDICATOR,
TRANSISTORIZED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006481
SCALE NONE	WT	SHEET 1 OF 1

1006481 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006481

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25203	9/23/65	A. Harano
1	CHANGED PER CCA R25476 DR P. Brown CHK S. F. Smith APPD A. Maynard	11/15/01	S. F. Smith
-	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

   B. PART MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S SYMBOL, LOT CODE OR NUMBER, TERMINAL IDENTIFICATION AND NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE I.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED IN NOTES 1.B. AND 1.C.

      (3) TERMINALS: EACH TERMINAL SHALL ACCOMMODATE TWO (2) NO. 20 AWG LEADS.

   B. ELECTRICAL CHARACTERISTICS:

      (1) INTERNAL CIRCUITRY: SEE FIGURE I. CHECK INPUT VOLTAGE AND CURRENT WITH LAMP AND LENS CAP PER NOTE 3.E.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:

   A. OPERATING LIFE: 20,000 HOURS MINIMUM WHEN OPERATED WITHIN DESIGN PARAMETERS WITH THE LAMP AND LENS SPECIFIED BELOW ON A 50% "ON" 50% "OFF" BASIS.

   B. CONSTRUCTION:

      (1) MATERIALS & FINISHES:

         (a) CASE AND FLANGE NUT: ALUMINUM, BLACK ANODIZED.

         (b) TERMINALS: BRASS WITH GOLD ELECTROPLATE OVER NICKEL FLASH.

         (c) HEADER: DIALLYL PHTHALATE PER MIL-M-14F TYPE SDG-F.

   C. OPERATING CONDITIONS: SEE FIGURE I.

   D. OPERATING AMBIENT TEMPERATURE RANGE: +10°C TO +60°C.

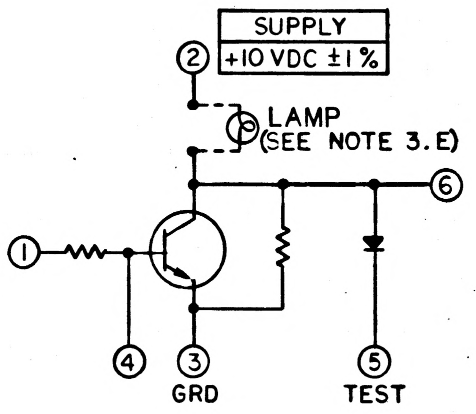
   E. ACCESSORY PARTS: (NOT SUPPLIED)

      (1) LAMP: NASA PART NO. 1006407-002.

      (2) LENS CAP: NASA PART NO. 1006401-005.

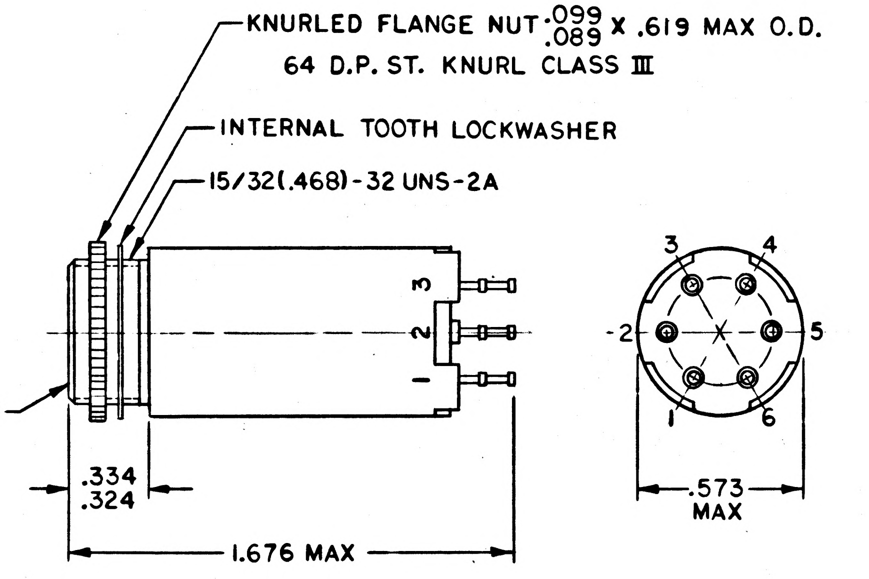
PROCURE ONLY FROM APPROVED SOURCES LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



INPUT AT TERM. I	
LIGHT ON	0.80±0.02V
LIGHT OFF	0.40±0.02V
SIGNAL CURRENT	1.2 MA MAX

FIGURE I — SCHEMATIC


KNURLED FLANGE NUT $^{.099}_{.089}$ X .619 MAX O.D.
64 D.P. ST. KNURL CLASS III
INTERNAL TOOTH LOCKWASHER
15/32(.468)-32 UNS-2A
5/16(.312)-32 UNEF-2B
3
2
1
.334
.324
1.676 MAX
3
4
2
5
1
6
.573
MAX

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS 9-497
DRAWN H. Wong DATE 17 Aug 65
CHECKED E. Ullman 19 AUG 65
APPROVAL P. J. Fergus 16 Sept 65
APPROVAL D. O'Bryant 9/16/65
APPROVAL W. J. Brown 9/23/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT, INDICATOR, TRANSISTORIZED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006481
SCALE NONE
WT
SHEET 1 OF 1

— 1006488

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25108		
—	RELEASED CLASS A PER TDRR 24524		

REVISIONS

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - B. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 2.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

TABLE I

DASH NO.	FIG. NO.	BARREL		INSUL GRIP		INSPECTION HOLE DIA.	INSUL DIA.		WIRE SIZE AWG
		I.D.	O.D.	I.D.	O.D.		MIN.	MAX.	
-001	1	.075 .081	.113 .103	.111 .121	.145 .135	.041 .051	.088	.110	14-16
-002	1	.075 .081	.113 .103	.095 .105	.145 .135	.041 .051	.072	.094	14-16
-003	2	.056 .062	.102 .092	.073 .083	.102 .092	.035 .045	.050	.072	18-20-22 19 SOLID
-004	2	.032 .038	.102 .092	.054 .064	.102 .092	.035 .045	.040	.053	22-24-26 22 SOLID
-005	2	.032 .038	.102 .092	.037 .047	.102 .092	.035 .045	.029	.036	22-24-26

2. ACCEPTANCE AND INSPECTION: SAMPLE.
   - A. MARKING: PER NOTE 1.B. AND 1.B.(1).
   - B. DIMENSIONS AND TOLERANCES: AS SPECIFIED IN FIGURES AND TABLE I.
   - C. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING DOCUMENTATION WITH EACH SHIPMENT.
     - (1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

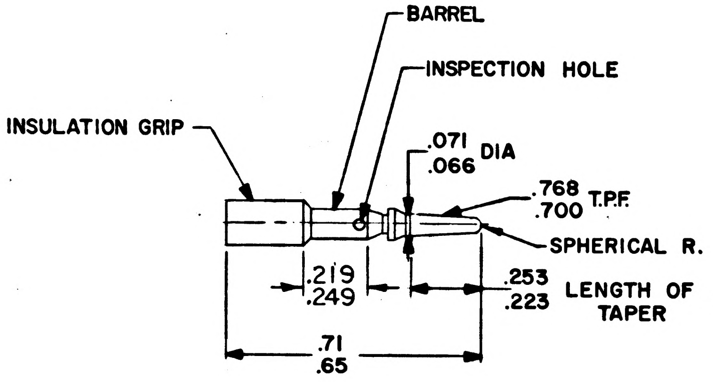


FIGURE 1.

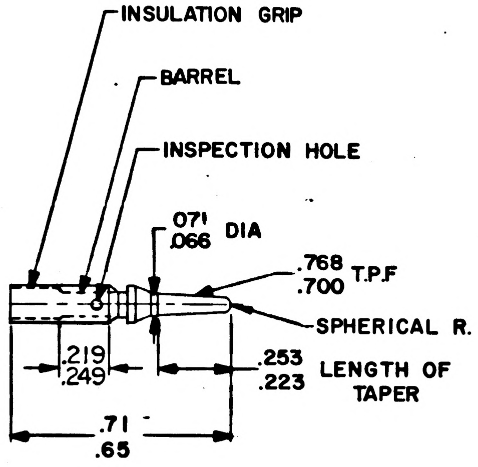


FIGURE 2.

3. DESIGN:
   - A. MATERIAL AND FINISH: BRASS ALLOY PER QQ-B-626 COMP 24 WITH .000030 MINIMUM HARD GOLD PLATE PER MIL-G-45204 TYPE II OVER .000200 MINIMUM SILVER PLATE PER QQ-S-365.
   - B. CONTACTS SPECIFIED HEREIN SHALL BE DESIGNED TO MATE WITH RECEPTACLES SPECIFIED IN NASA DRAWING 1006486.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE 3

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN J. Doty DATE 1 Jul 65
CHECKED 26 JUL 65
APPROVAL 8/16/65 11/29/65
APPROVAL 8/18/65
APPROVAL 18 Aug 65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL G. Varano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL, TAPERED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006488

SCALE NONE | WT | SHEET 1 OF 1

A	1006489

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
O	RELEASED PER CCA R25429	10/29/65	O. Harano
—	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25030 DR D. Wong CHK [illegible] APPD [illegible]		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, SENSITIVITY AND CALIBRATION ADJUSTMENT IDENTIFICATION, DATE OF MANUFACTURE OR DATE CODE, SERIAL NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: 100%

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: AS DELINEATED HEREIN.

(2) MARKING: AS SPECIFIED IN NOTES 1.B AND 1.C.

B. ELECTRICAL CHARACTERISTICS: WHEN THE INDIVIDUAL UNITS ARE INTERCONNECTED AS SHOWN IN FIGURE 1, THE FOLLOWING CHARACTERISTICS SHALL BE INSPECTED.

(1) MEASUREMENT RANGES (FULL SCALE READINGS): 4.000, 40.00, 400.0 AND 1000 VOLTS.

(2) DECIMAL INDICATOR: ILLUMINATED DECIMAL POINT WHICH SHIFTS TO PROPER POSITION WHEN RANGE SELECTOR SHAFT IS ROTATED.

(3) MEASUREMENT ACCURACY: ± 0.1% FROM +60°F TO +115°F AMBIENT (MAY BE AFFECTED BY SENSITIVITY ADJUSTMENT).

(4) LINEARITY: ±0.05%

(5) RESOLUTION: 0.05% OF FULL SCALE READING (MAY BE AFFECTED BY SENSITIVITY ADJUSTMENT).

(6) INPUT IMPEDANCE: 500 KILOHMS BEFORE BALANCE, INCREASING TO 2.2 MEGOHMS AT BALANCE.

(7) AC REJECTION: 50 DB AT 60 CYCLES PER SECOND.

(8) BALANCING TIME TO FULL SCALE: 3.5 SECONDS MAXIMUM FOR DIGITAL DISPLAY OF 1000 AND 7.5 SECONDS FOR DISPLAY OF 4000.

(9) OVERLOAD PROTECTION: 500 VDC NORMAL OR REVERSE POLARITY ON LOWEST (4.000) SCALE AND 1250 VDC ON ALL OTHER SCALES.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

(1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

(2) TWO (2) COPIES OF OPERATING AND INSTRUCTION MANUALS.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

3. DESIGN:

A. POWER REQUIREMENTS: 105-125 VRMS, 0.25 AMPERES MAXIMUM, 50-60 CPS.

B. CONSTRUCTION:

(1) AMPLIFIER: OPEN PRINTED CIRCUIT COMPONENT BOARDS WITH CONNECTIONS TERMINATED AT A BARRIER TYPE TERMINAL BOARD. (REFERENCE: NO. 5 TERMINAL SCREWS).

(2) DIGITAL READOUT: OPEN CONSTRUCTION WITH AN EXPOSED COMPONENT PANEL ON THE REAR OF THE UNIT. CONNECTIONS ARE TERMINATED ON THE COMPONENT BOARD BY TURRET TERMINALS, EACH CAPABLE OF ACCOMMODATING TWO (2) NO. 20 AWG LEADS.

(3) INDICATOR RANGE SELECTOR: 4 POSITION SWITCH WITH 30° DETENT POSITIONS. THE LOWEST RANGE (4.000) IS IN THE EXTREME CW POSITION.

C. ACCESSORY PARTS:

(1) BEZEL AND LENS: A -003 BEZEL-LENS ASSEMBLY SHALL NOT BE SUPPLIED WITH EACH -002 INDICATOR UNIT.

(2) ZERO POTENTIOMETER: A POTENTIOMETER (NASA PART 1006427) SHALL BE SUPPLIED WITH EACH -001 AMPLIFIER UNIT.

(3) KNOB: A POINTER KNOB USED ON THE .25 DIAMETER RANGE SELECTOR SHAFT SHALL BE SUPPLIED WITH EACH INDICATOR UNIT.

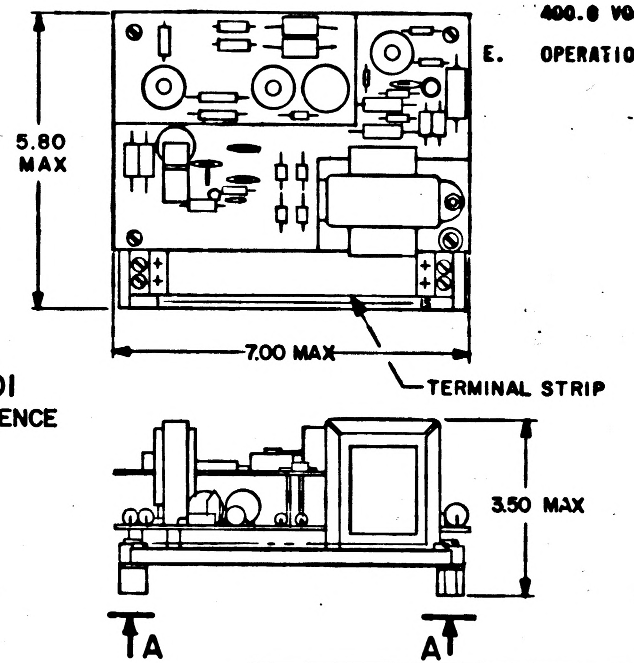
D. ADJUSTMENTS:

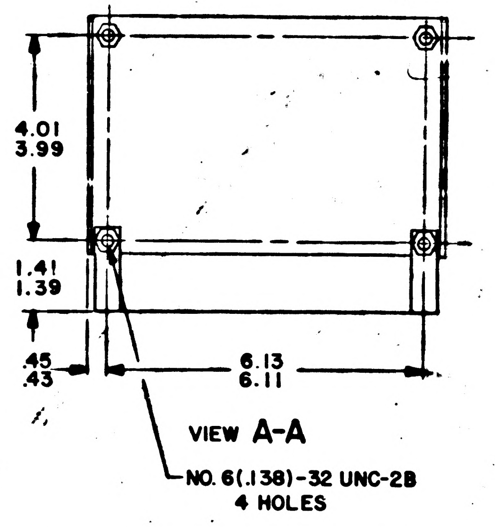
(1) SENSITIVITY: POTENTIOMETER (R31) MOUNTED ON THE AMPLIFIER-REFERENCE UNIT. CW ADJUSTMENT INCREASES SENSITIVITY, CCW DECREASES. CAUTION: SETTING SENSITIVITY TO LOW MAY IMPAIR ACCURACY AND RESOLUTION.

(2) CALIBRATION: POTENTIOMETER (R51) MOUNTED ON THE REFERENCE BOARD CALIBRATES THE LOWEST (4.000) SCALE AND SETS THE SPAN FOR ALL OTHER RANGES. THREE NON-INTERACTING POTENTIOMETERS MOUNTED ON THE BOTTOM OF THE INDICATOR UNIT CALIBRATE THE OTHER RANGES. R44 CALIBRATES THE 40.00 VOLT RANGE, R45 THE 400.0 VOLT RANGE AND R46 THE 1000 VOLT RANGE.

E. OPERATIONAL LIFE: 10,000 HOURS MINIMUM.

1006489-001
AMPLIFIER – REFERENCE





QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN [illegible] DATE 12 AUG 65
CHECKED [illegible] 29 SEP 65
APPROVAL [illegible] 27 Oct 65
APPROVAL [illegible] 10/25/65
APPROVAL [illegible]
NASA APPROVAL A. C. METZGER
MIT APPROVAL [illegible]
MIT APPROVAL O. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL,
CONTINUOUS READING

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 49956
NASA DRAWING NO. 1006489
SCALE NONE
WT
SHEET 1 OF 2

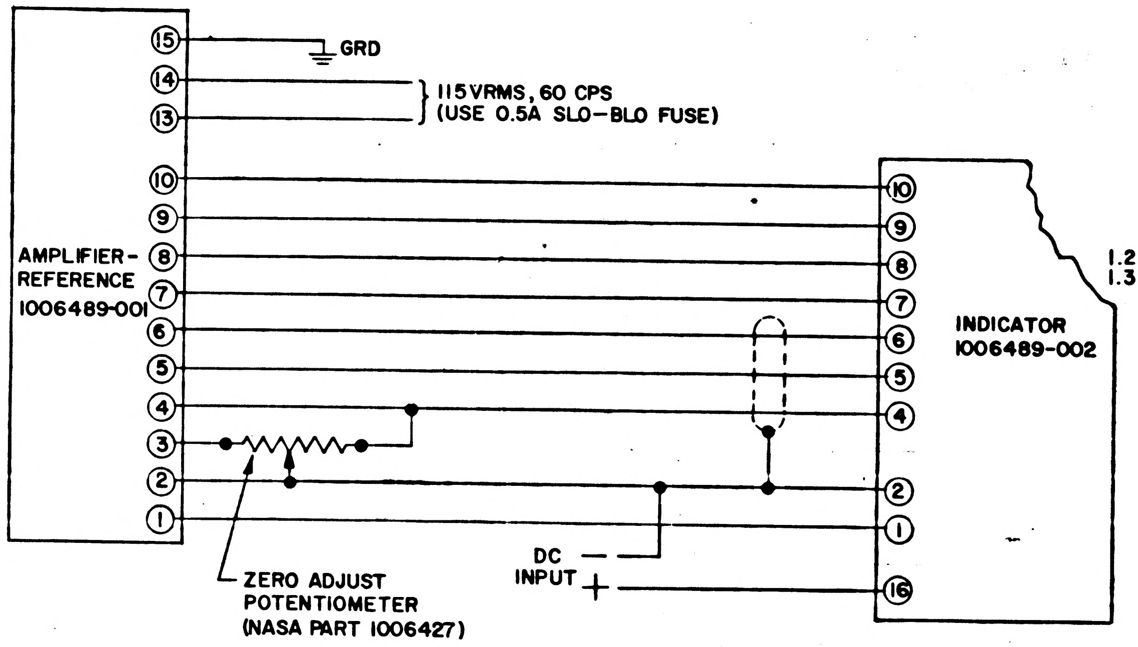
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 02089

A	1006489

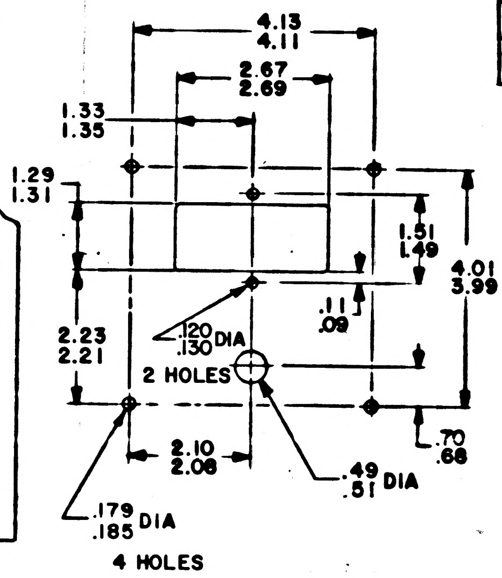
1006489 A

SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25429	10/29/65	A. Harano
-	RELEASED CLASS A PER TDRR 24524		
A	REVISED PER TDRR 25038 DR J. Doty CHK Bob Marsh APPD A Maynard		



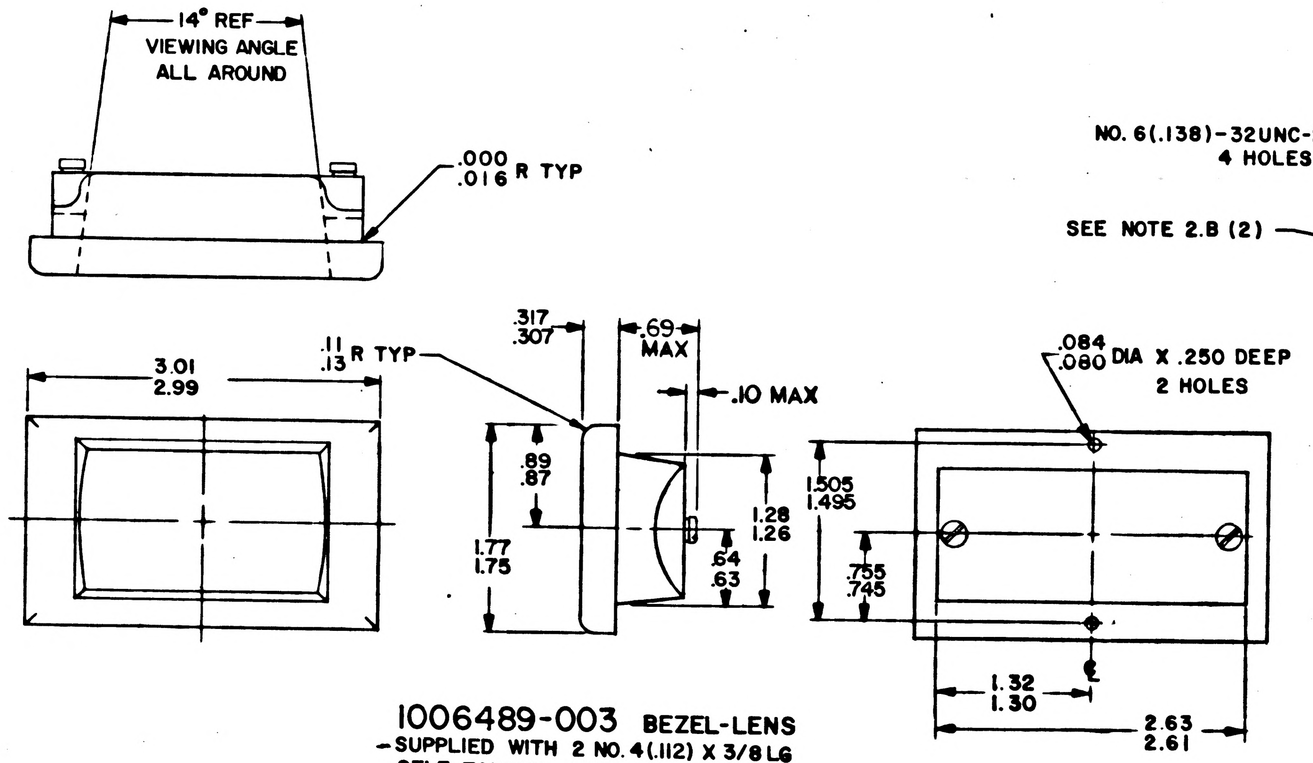
GRD
115VRMS, 60 CPS
(USE 0.5A SLO-BLO FUSE)
AMPLIFIER-REFERENCE
1006489-001
INDICATOR
1006489-002
ZERO ADJUST POTENTIOMETER
(NASA PART 1006427)
DC INPUT
-
+

FIGURE I. INTERCONNECTING DIAGRAM



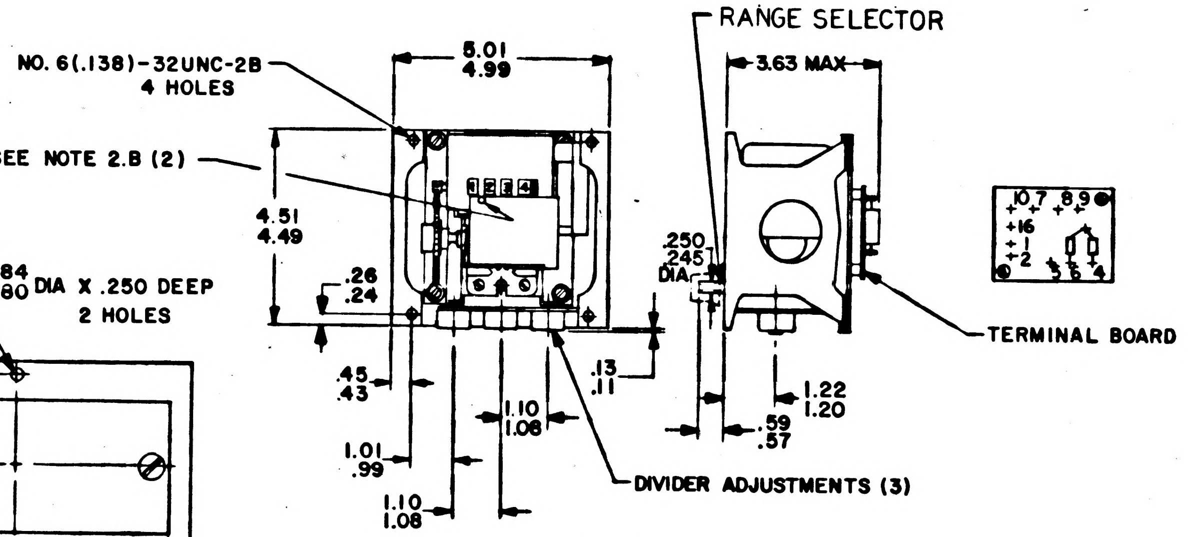
4.13
4.11
2.67
2.69
1.33
1.35
1.29
1.31
1.51
1.49
4.01
3.99
.11
.09
2.23
2.21
.120
.130 DIA
2 HOLES
2.10
2.08
.70
.68
.49
.51 DIA
.179
.185 DIA
4 HOLES

RECOMMENDED MOUNTING HOLES FOR INDICATOR



14° REF
VIEWING ANGLE ALL AROUND
.000
.016 R TYP
3.01
2.99
.11
.13 R TYP
.317
.307
.69 MAX
.10 MAX
.89
.87
1.77
1.75
1.28
1.26
.64
.63
.084
.080 DIA X .250 DEEP
2 HOLES
1.505
1.495
.755
.745
1.32
1.30
2.63
2.61

1006489-003 BEZEL-LENS
- SUPPLIED WITH 2 NO. 4 (.112) X 3/8 LG SELF TAPPING SCREWS.
- .093 THK OPTIMUM MOUNTING PANEL



NO. 6(.138)-32UNC-2B
4 HOLES
SEE NOTE 2.8 (2)
5.01
4.99
RANGE SELECTOR
3.63 MAX
4.51
4.49
.26
.24
.250
.245 DIA
TERMINAL BOARD
.45
.43
.13
.11
1.22
1.20
1.10
1.08
.59
.57
1.01
.99
1.10
1.08
DIVIDER ADJUSTMENTS (3)

1006489-002
INDICATOR

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN J. Doty DATE 16 Aug 65
CHECKED D. Laperle 29 SEP 65
APPROVAL 27 Oct 65
APPROVAL 10/25/65
APPROVAL
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Harano

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL,
CONTINUOUS READING
SPECIFICATION CONTROL DRAWING

SIZE	CODE IDENT NO.	NASA DRAWING NO.
C	49956	1006489

SCALE NONE WT SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006489 A

—	1006489

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25429	10/29/65	A. Harano
—	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.

   B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, SENSITIVITY AND CALIBRATION ADJUSTMENT IDENTIFICATION, DATE OF MANUFACTURE OR DATE CODE, SERIAL NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION LETTER.

   C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 6.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: 100%

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: AS DELINEATED HEREIN.

      (2) MARKING: AS SPECIFIED IN NOTES 1.B AND 1.C.

   B. ELECTRICAL CHARACTERISTICS: WHEN THE INDIVIDUAL UNITS ARE INTERCONNECTED AS SHOWN IN FIGURE 1, THE FOLLOWING CHARACTERISTICS SHALL BE INSPECTED.

      (1) MEASUREMENT RANGES (FULL SCALE READINGS): 4.000, 40.00, 400.0 AND 1000 VOLTS.

      (2) DECIMAL INDICATOR: ILLUMINATED DECIMAL POINT WHICH SHIFTS TO PROPER POSITION WHEN RANGE SELECTOR SHAFT IS ROTATED.

      (3) MEASUREMENT ACCURACY: ± 0.1% FROM +60°F TO +115°F AMBIENT (MAY BE AFFECTED BY SENSITIVITY ADJUSTMENT).

      (4) LINEARITY: ±0.05%

      (5) RESOLUTION: 0.05% OF FULL SCALE READING (MAY BE AFFECTED BY SENSITIVITY ADJUSTMENT).

      (6) INPUT IMPEDANCE: 500 KILOHMS BEFORE BALANCE, INCREASING TO 2.2 MEGOHMS AT BALANCE.

      (7) AC REJECTION: 50 DB AT 60 CYCLES PER SECOND.

      (8) BALANCING TIME TO FULL SCALE: 3.5 SECONDS MAXIMUM FOR DIGITAL DISPLAY OF 1000 AND 7.5 SECONDS FOR DISPLAY OF 4000.

      (9) OVERLOAD PROTECTION: 500 VDC NORMAL OR REVERSE POLARITY ON LOWEST (4.000) SCALE AND 1250 VDC ON ALL OTHER SCALES.

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF UNITS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

3. DESIGN:

   A. POWER REQUIREMENTS: 105-125 VRMS, 0.25 AMPERES MAXIMUM, 50-60 CPS.

   B. CONSTRUCTION:

      (1) AMPLIFIER: OPEN PRINTED CIRCUIT COMPONENT BOARDS WITH CONNECTIONS TERMINATED AT A BARRIER TYPE TERMINAL BOARD. (REFERENCE: NO. 5 TERMINAL SCREWS).

      (2) DIGITAL READOUT: OPEN CONSTRUCTION WITH AN EXPOSED COMPONENT PANEL ON THE REAR OF THE UNIT. CONNECTIONS ARE TERMINATED ON THE COMPONENT BOARD BY TURRET TERMINALS, EACH CAPABLE OF ACCOMMODATING TWO (2) NO. 20 AWG LEADS.

      (3) INDICATOR RANGE SELECTOR: 4 POSITION SWITCH WITH 30° DETENT POSITIONS. THE LOWEST RANGE (4.000) IS IN THE EXTREME CW POSITION.

   C. ACCESSORY PARTS:

      (1) BEZEL AND LENS: A -003 BEZEL-LENS ASSEMBLY SHALL NOT BE SUPPLIED WITH EACH -002 INDICATOR UNIT.

      (2) ZERO POTENTIOMETER: A POTENTIOMETER (NASA PART 1006427) SHALL BE SUPPLIED WITH EACH -001 AMPLIFIER UNIT.

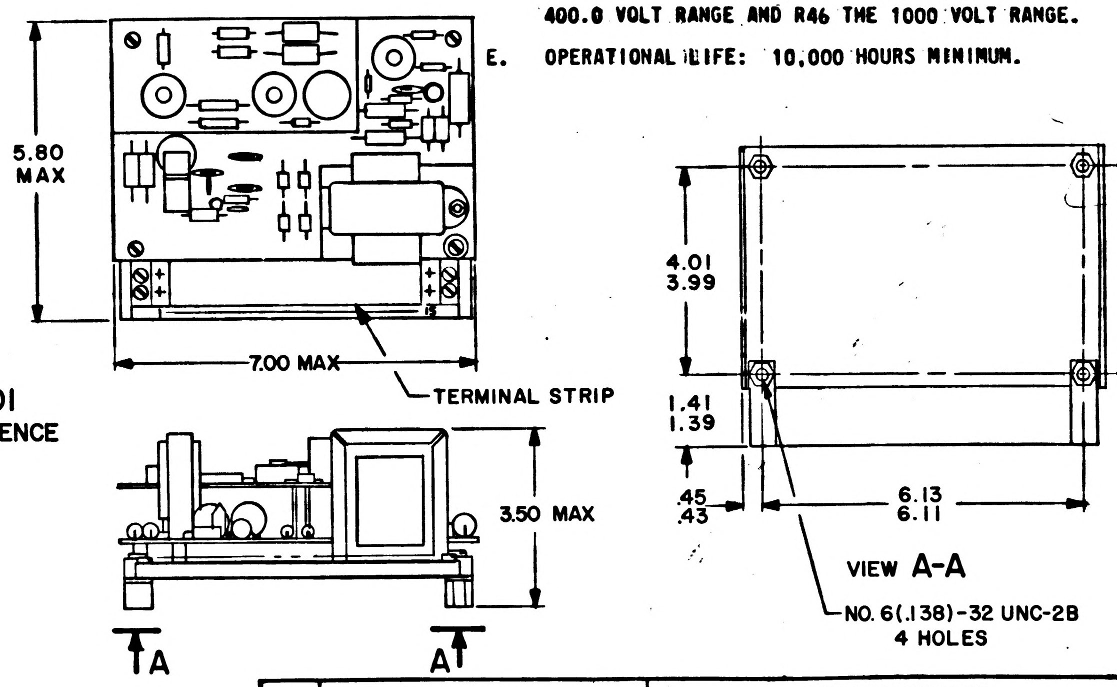
      (3) KNOB: A POINTER KNOB USED ON THE .25 DIAMETER RANGE SELECTOR SHAFT SHALL BE SUPPLIED WITH EACH INDICATOR UNIT.

   D. ADJUSTMENTS:

      (1) SENSITIVITY: POTENTIOMETER (R31) MOUNTED ON THE AMPLIFIER-REFERENCE UNIT. CW ADJUSTMENT INCREASES SENSITIVITY, CCW DECREASES. CAUTION: SETTING SENSITIVITY TO LOW MAY IMPAIR ACCURACY AND RESOLUTION.

      (2) CALIBRATION: POTENTIOMETER (R51) MOUNTED ON THE REFERENCE BOARD CALIBRATES THE LOWEST (4.000) SCALE AND SETS THE SPAN FOR ALL OTHER RANGES. THREE NON-INTERACTING POTENTIOMETERS MOUNTED ON THE BOTTOM OF THE INDICATOR UNIT CALIBRATE THE OTHER RANGES. R44 CALIBRATES THE 40.00 VOLT RANCE, R45 THE 400.0 VOLT RANGE AND R46 THE 1000 VOLT RANGE.

   E. OPERATIONAL LIFE: 10,000 HOURS MINIMUM.



1006489-001
AMPLIFIER — REFERENCE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN DATE 12AUG65
CHECKED D. Laperle 29SEP65
APPROVAL 27OCT65
APPROVAL D. O'Bryant 10/25/65
APPROVAL 10/29/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7Dec65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL,
CONTINUOUS READING

SPECIFICATION CONTROL DRAWING

SIZE	CODE IDENT NO.	NASA DRAWING NO.
C	49956	1006489

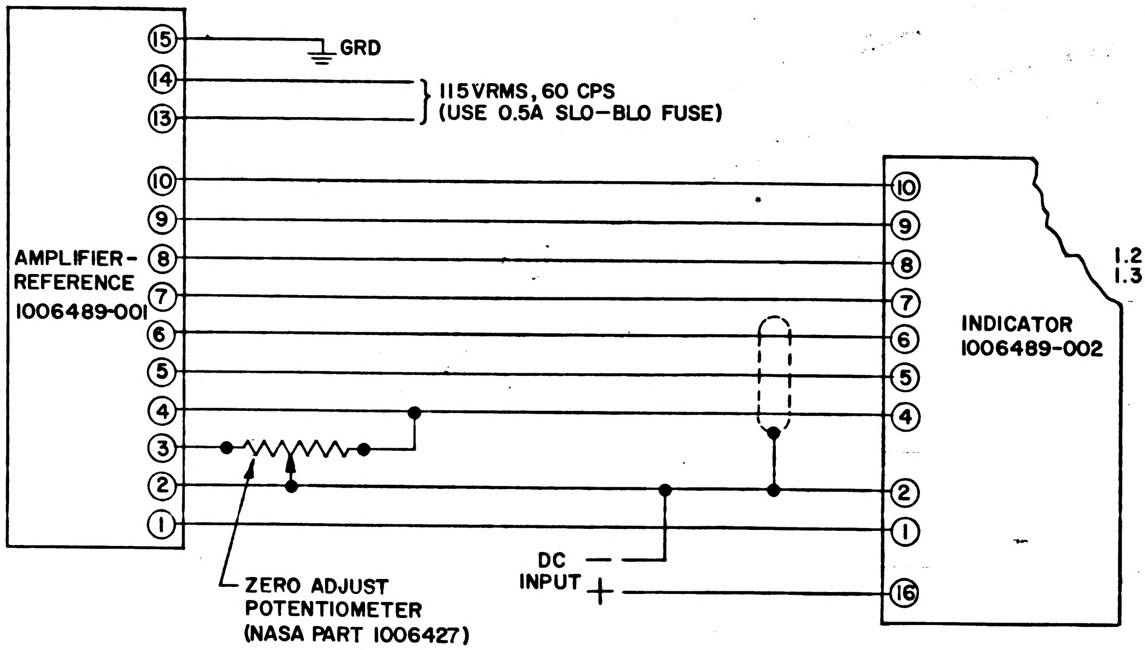
SCALE NONE | WT | SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 02089

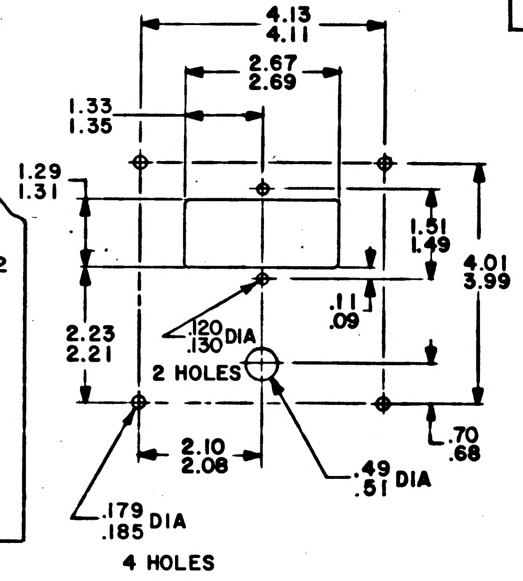
1006489 -

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25429	10/29/65	A. Harano
-	RELEASED CLASS A PER TDRR 24524		



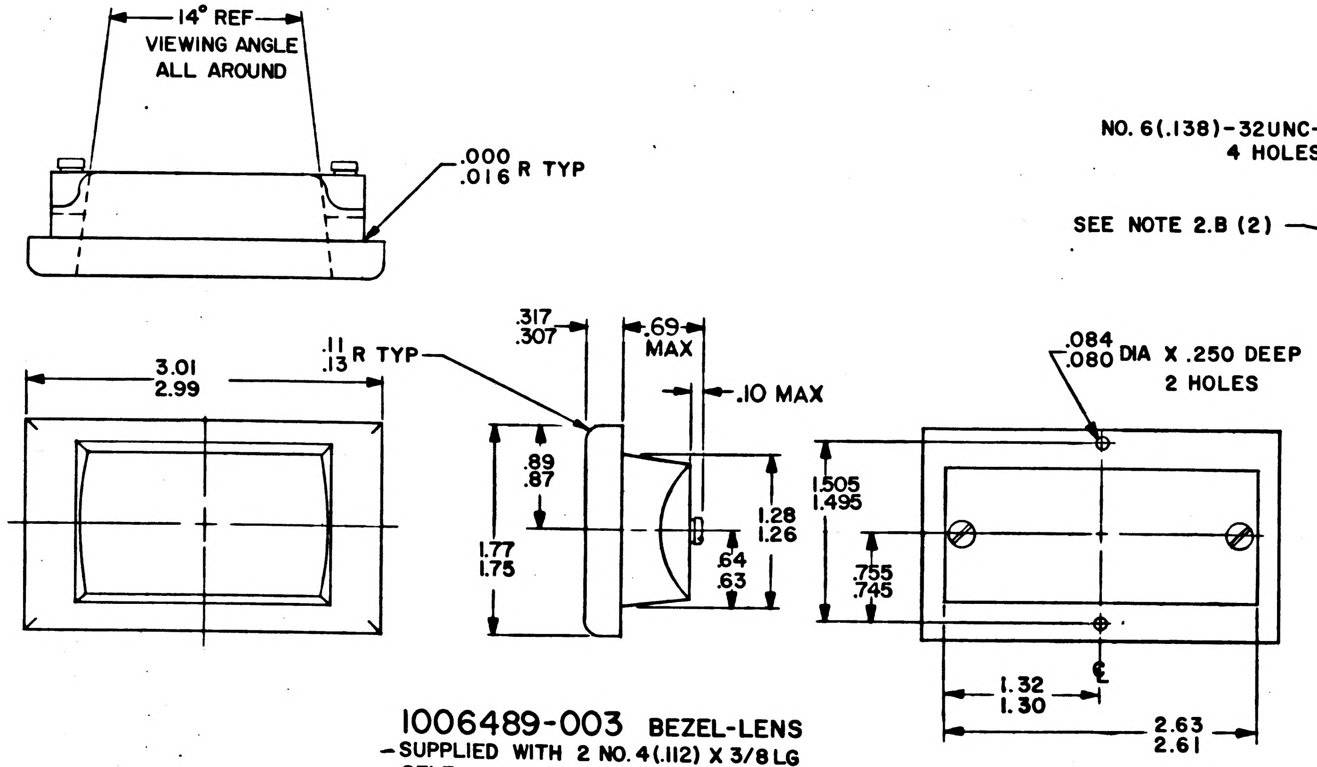
⑮ GRD
⑭ ⑬ 115VRMS, 60 CPS (USE 0.5A SLO-BLO FUSE)
AMPLIFIER-REFERENCE 1006489-001
⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ①
INDICATOR 1006489-002
⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ② ① ⑯
ZERO ADJUST POTENTIOMETER (NASA PART 1006427)
DC INPUT − +

FIGURE I. INTERCONNECTING DIAGRAM



4.13
4.11
2.67
2.69
1.33
1.35
1.29
1.31
1.51
1.49
4.01
3.99
.11
.09
2.23
2.21
.120
.130 DIA
2 HOLES
2.10
2.08
.49
.51 DIA
.70
.68
.179
.185 DIA
4 HOLES

RECOMMENDED MOUNTING HOLES FOR INDICATOR

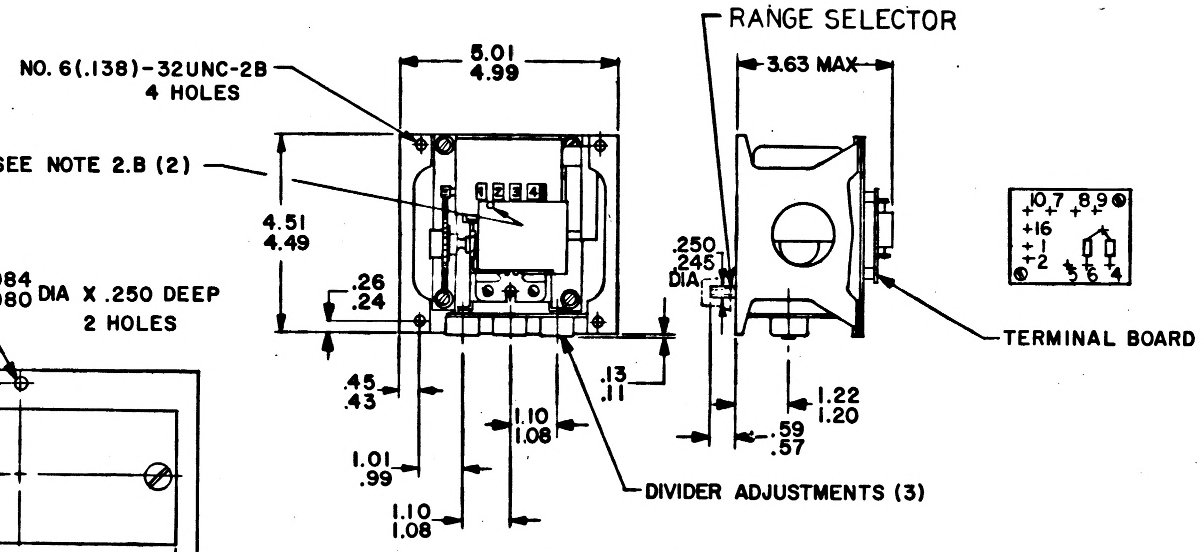


14° REF
VIEWING ANGLE ALL AROUND
.000
.016 R TYP
3.01
2.99
.11
.13 R TYP
.317
.307
.69 MAX
.10 MAX
.89
.87
1.77
1.75
1.28
1.26
.64
.63
.084
.080 DIA X .250 DEEP
2 HOLES
1.505
1.495
.755
.745
1.32
1.30
℄
2.63
2.61

1006489-003 BEZEL-LENS

-SUPPLIED WITH 2 NO. 4(.112) X 3/8 LG SELF TAPPING SCREWS.

-.093 THK OPTIMUM MOUNTING PANEL



RANGE SELECTOR
5.01
4.99
3.63 MAX
NO. 6(.138)-32UNC-2B
4 HOLES
SEE NOTE 2.B (2)
1 2 3 4
4.51
4.49
.26
.24
.250
.245
DIA
10 7 8 9
+16
+1
+2 3 6 4
TERMINAL BOARD
.45
.43
.13
.11
1.10
1.08
1.01
.99
1.10
1.08
1.22
1.20
.59
.57
DIVIDER ADJUSTMENTS (3)

1006489-002
INDICATOR

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-497
DRAWN J. Doty DATE 16 Aug 65
CHECKED D. Laperle 29 SEP 65
APPROVAL 27 Oct 65
APPROVAL D. O'Bryant 10/25/65
APPROVAL 11/29/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Harano 10/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL,
CONTINUOUS READING

SPECIFICATION CONTROL DRAWING

SIZE	CODE IDENT NO.	NASA DRAWING NO.
C	49956	1006489

SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 02089

1006490 A

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

   B. MARKING: CONNECTORS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND PART NUMBER, THE NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), REVISION LETTER AND CONTACT DESIGNATIONS.

   C. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 3.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE.

   A. MARKING: PER NOTE 1.B, 1.C, AND 1.C.(1).

   B. DIMENSIONS AND TOLERANCES: AS SPECIFIED HEREIN.

   C. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING DOCUMENTATION WITH EACH SHIPMENT.

      (1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:

   A. MATERIAL AND FINISH:

      (1) PLUG BODY: MOLDED PHENOLIC RESIN PER MIL-M-14 TYPE MFH, FOR #16 CONTACT. MOLDED DIALLYL PHTHALATE RESIN PER MIL-M-14, TYPE MDG, FOR #20 CONTACT.

      (2) JACKSCREW PIN, JACKSCREW SOCKET AND SPACER: CORROSION RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A PASSIVATED PER MIL-F-14072 METHOD E300.

      (3) HOOD ASSEMBLY: ALUMINUM ALLOY PER QQ-A-250A/8A WITH GOLDEN CHROMATE FINISH PER MIL-C-5541.

   B. THIS CONNECTOR PLUG SHALL BE DESIGNED FOR CONTACTS LISTED IN TABLE I.

   C. THIS CONNECTOR PLUG SHALL BE DESIGNED TO MATE WITH CONNECTOR RECEPTACLES LISTED IN TABLE I.

   D. ELECTRICAL CHARACTERISTICS: CONNECTORS SHALL HAVE THE FOLLOWING ELECTRICAL CHARACTERISTICS WHEN CONTACTS PER TABLE I ARE PROPERLY INSTALLED.

      (1) CONTACT CURRENT RATING: 7.5 AMPERES MAXIMUM FOR NO. 20 AWG CONTACTS; 13 AMPERES MAXIMUM FOR NO. 16 AWG CONTACTS.

      (2) OPERATING VOLTAGE: 750 VOLTS AC MAXIMUM, 60 CPS.

      (3) CONTACT VOLTAGE DROP: 20 MILLIVOLTS MAXIMUM AT 7.5 AMPERES MAXIMUM FOR NO. 20 AWG MACHINED CONTACTS. 23 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG MACHINED CONTACTS AND 25 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG FORMED CONTACTS.

      (4) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM WHEN TESTED PER MIL-STD-202 METHOD 302 CONDITION B BEFORE AND AFTER THE SALT SPRAY AND MOISTURE RESISTANCE TESTS SPECIFIED HEREIN.

      (5) HIGH POTENTIAL TEST: 2250 VOLTS AC, 60 CPS FOR 1 MINUTE DURATION FOR NO. 20 AWG CONTACTS; 2000 VOLTS AC, 60 CPS FOR 1 MINUTE DURATION FOR NO. 16 AWG CONTACTS.

   E. OPERATING TEMPERATURE: FROM -55°C TO +125°C.

   F. ENVIRONMENTAL TESTS: WHEN MATED WITH ITS MATING PART THE CONNECTOR SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING TESTS.

      (1) SALT SPRAY: PER MIL-STD-202 METHOD 101 CONDITION A.

      (2) MOISTURE RESISTANCE: PER MIL-STD-202 METHOD 106 FOR CONNECTORS WITH MACHINED CONTACTS AND 240 HOURS AT 40°C AND 90 TO 95% RELATIVE HUMIDITY FOR CONNECTORS WITH FORMED CONTACTS.

      (3) VIBRATION: PER MIL-STD-202 METHOD 204.

      (4) SHOCK: PER MIL-STD-202 METHOD 207 FOR CONNECTORS WITH NO. 16 AWG CONTACTS AND MIL-STD-202 METHOD 202A FOR CONNECTORS WITH NO. 20 AWG CONTACTS.

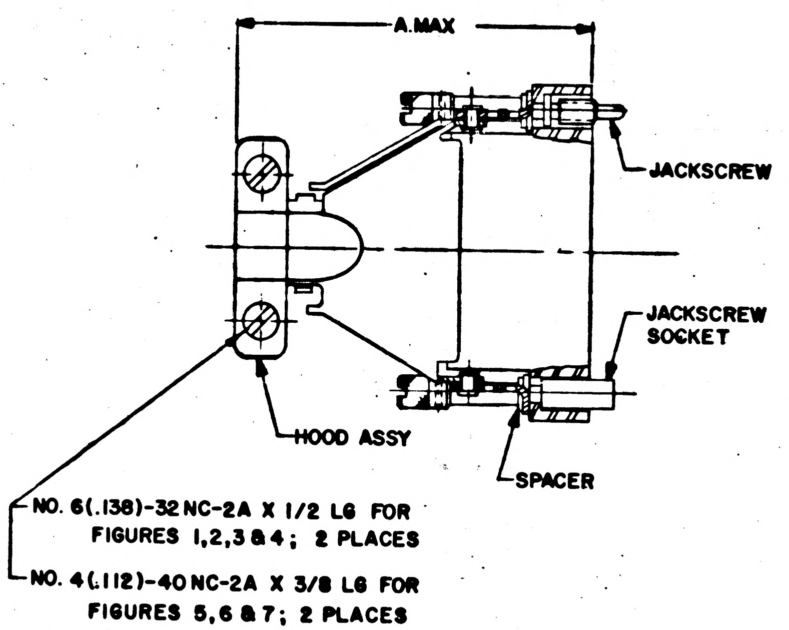
   G. DURABILITY: 500 CYCLES MINIMUM MATING AND UNMATING.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25270	10/21/65	A. Harano
1	CHANGED PER CCA R25539 DR F. McDonagh CHK APPD H. Maynard	11/19/65	
[illegible]	CLASS A RELEASED PER TDRR 24524		
A	REVISED PER TDRR 25037 DR CHK APPD H. Maynard	1/18/66	

1006490-015 THRU-028


A.MAX
JACKSCREW
JACKSCREW SOCKET
HOOD ASSY
SPACER
NO. 6(.138)-32 NC-2A X 1/2 LG FOR FIGURES 1,2,3 & 4; 2 PLACES
NO. 4(.112)-40 NC-2A X 3/8 LG FOR FIGURES 5,6 & 7; 2 PLACES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J.T. DOTY DATE 6 JUL 65
CHECKED W Lyons 20 JUL 65
APPROVAL
APPROVAL
APPROVAL 10/21/65
NASA APPROVAL E. C. METZLER
MIT APPROVAL 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

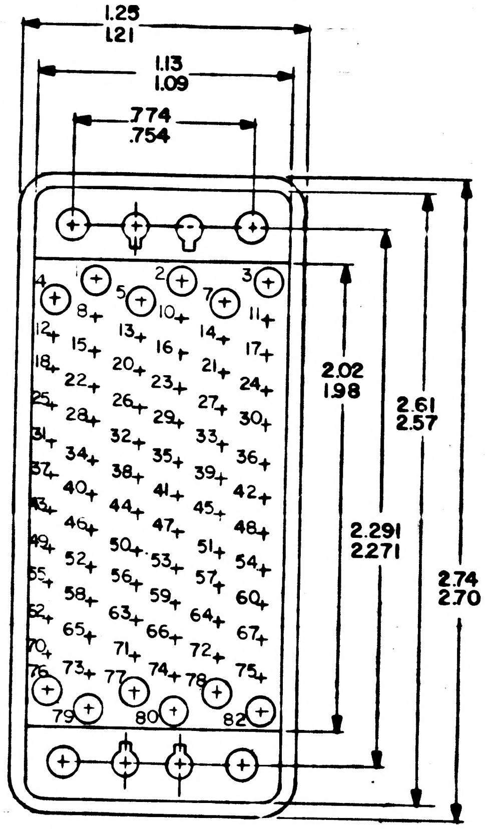
CONNECTOR, PLUG, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006490

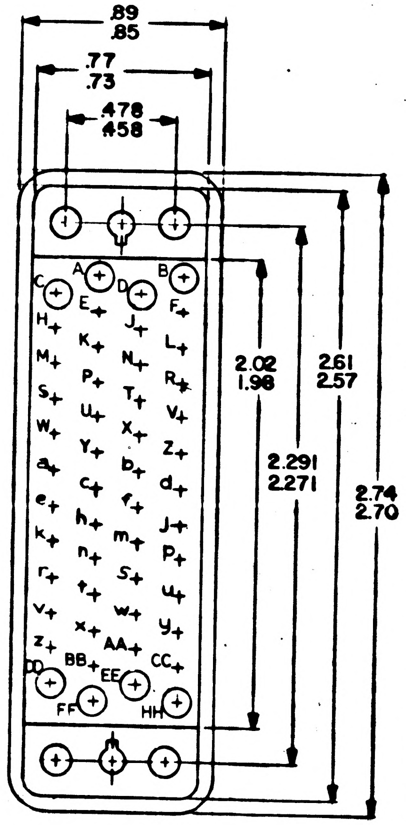
SCALE NONE WT SHEET 1 OF 3

SYM	DESCRIPTION	DATE	APPROVED
O	RELEASED PER CCA R25270	10/21/65	A. Harano
1	CHANGED PER CCA R25539 DR CHK T.D. Fazzi APPD H. Maynard	11/19/65	
-	CLASS A RELEASED PER TDRR 24524		
A	REVISED PER TDRR 25037 DR R. Donato CHK J. J. Rozanski APPD H. Maynard	4/18/66	



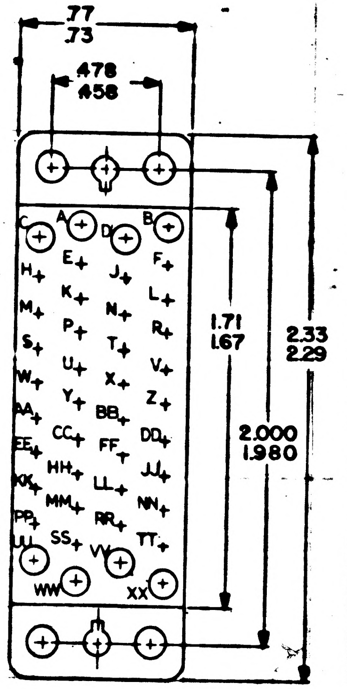
1.25
1.21
1.13
1.09
.774
.754
2.02
1.98
2.61
2.57
2.291
2.271
2.74
2.70

FIGURE 1



.89
.85
.77
.73
.478
.458
2.02
1.98
2.61
2.57
2.291
2.271
2.74
2.70

FIGURE 2



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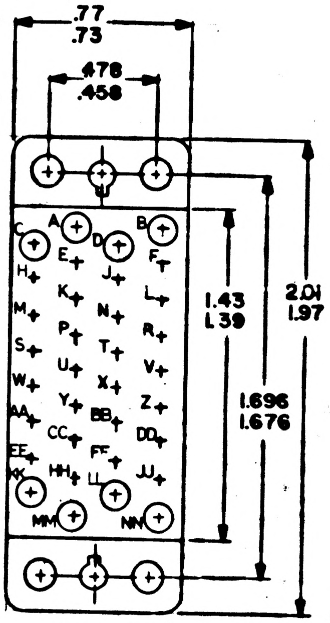
.73
.478
.458
1.71
1.67
2.33
2.29
2.000
1.980

FIGURE 3



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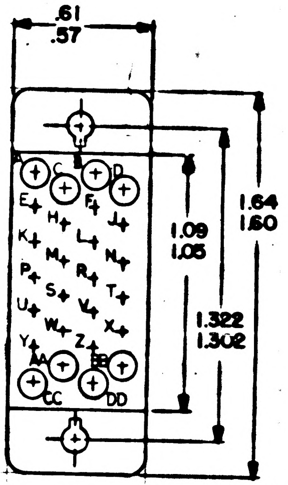
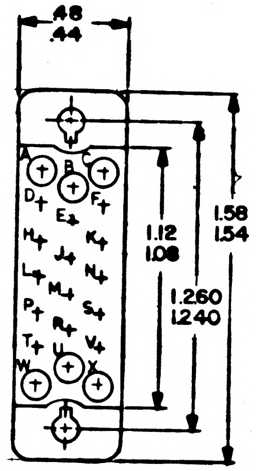
.73
.478
.458
1.43
1.39
2.01
1.97
1.696
1.676

FIGURE 4



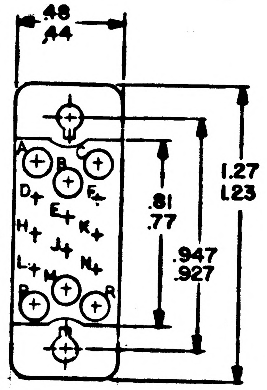
.61
.57
1.09
1.05
1.64
1.60
1.322
1.302

FIGURE 5



.48
.44
1.12
1.08
1.58
1.54
1.260
1.240

FIGURE 6



.48
.44
.81
.77
1.27
1.23
.947
.927

FIGURE 7

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J.T.DOTY DATE 6 JUL 65
CHECKED W. Lyons 20 JUL 65
APPROVAL 30 Oct 65
APPROVAL D. O'Bryant 10/5/65
APPROVAL M. J. Bunn 10/21/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Crafty 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006490
SCALE NONE
WT
SHEET 2 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006490 A

1006490 A

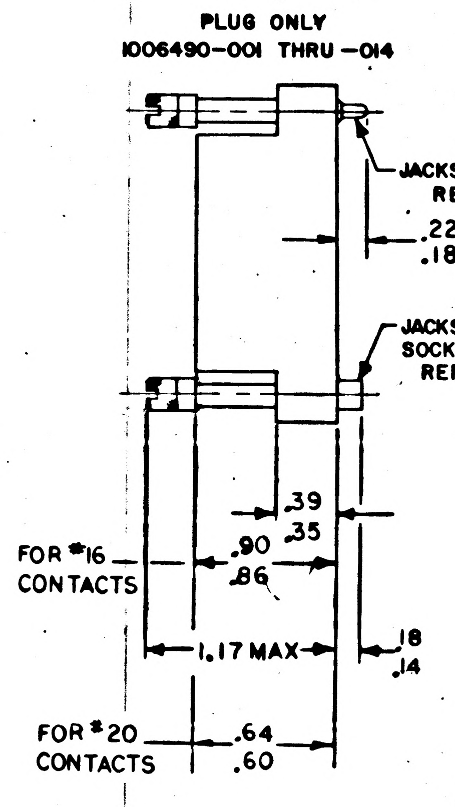
TABLE I

DASH NUMBERS		CONTACT SIZE AWG	NO. OF CONTACT POSITIONS	DIMENSION A MAX	CONTACTS SEE NOTE 3.B.	MATING RECEPTACLE SEE NOTE 3.C.
WITHOUT HOOD	WITH HOOD					
-001	-015	20	75 FIG. 1	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-001,
-002	-016	16	75 FIG. 1	2.230	1006491-009, -010, -011, -012	1006494-002
-003	-017	20	50 FIG. 2	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-003
-004	-018	16	50 FIG. 2	2.230	1006491-009, -010, -011, -012	1006494-004
-005	-019	20	42 FIG. 3	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-005
-006	-020	16	42 FIG. 3	2.230	1006491-009, -010, -011, -012	1006494-006
-007	-021	20	34 FIG. 4	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-007
-008	-022	16	34 FIG. 4	2.230	1006491-009, -010, -011, -012	1006494-008
-009	-023	20	26 FIG. 5	1.915	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-009
-010	-024	16	26 FIG. 5	1.915	1006491-009, -010, -011, -012	1006494-010
-011	-025	20	20 FIG. 6	1.915	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-011
-012	-026	16	20 FIG. 6	1.915	1006491-009, -010, -011, -012	1006494-012
-013	-027	20	14 FIG. 7	1.915	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-013
-014	-028	16	14 FIG. 7	1.915	1006491-009, -010, -011, -012	1006494-014

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
O	RELEASED PER CCA R25270	10/21/65	O Harano
1	CHANGED PER CCA R25539 DR P. Milard CHK [illegible] APPD H. Maynard	11/19/65	
-	CLASS A RELEASED PER TDRR 24524		
A	REVISED PER TDRR 25037 DR [illegible] CHK [illegible] APPD H. Maynard	[illegible]	

PLUG ONLY
1006490-001 THRU -014



HOOD ONLY
1006490-029 THRU -035

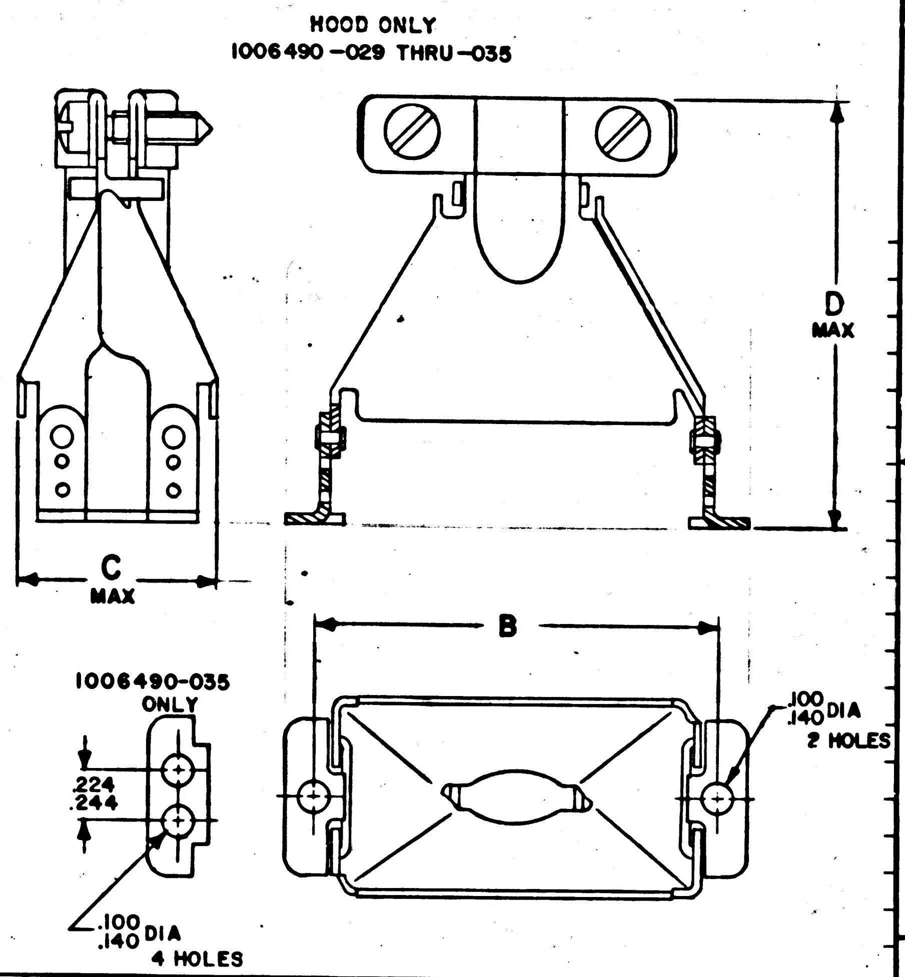


TABLE II

DASH NO.	DIMENSIONS			PART OF
	B	C	D	
-029	.96 .92	.583 .573	1.555 1.545	-027 -028
-030	1.27 1.23	.583 .576	1.555 1.545	-025 -026
-031	1.33 1.29	.715 .705	1.555 1.545	-023 -024
-032	1.71 1.67	.880 .870	1.870 1.860	-021 -022
-033	2.01 1.97	.880 .870	1.870 1.860	-019 -020
-034	2.30 2.26	.880 .870	1.870 1.860	-017 -018
-035	2.30 2.26	1.255 1.245	1.870 1.860	-015 -016

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J.T. DOTY DATE 6 JUL 65
CHECKED W. Lyons 20 JUL 65
APPROVAL [illegible] 3 Oct 65
APPROVAL D. [illegible] 10/5/65
APPROVAL M. J. Bern[illegible] 10/1/65
NASA APPROVAL A. G. METZGER
MIT APPROVAL W. Kupfer 7 Dec 65
MIT APPROVAL O. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG,
ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006490
SCALE NONE
WT
SHEET 3 OF 3

—	1006490

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25270	10/21/65	A. Harano
1	CHANGED PER CCA R25539 DR F. McDonagh CHK K D Fragin APPD H. Maynard	11/19/65	StS
—	CLASS A RELEASED PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

   B. MARKING: CONNECTORS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND PART NUMBER, THE NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), REVISION LETTER AND CONTACT DESIGNATIONS.

   C. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 3.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE.

   A. MARKING: PER NOTE 1.B, 1.C, AND 1.C.(1).

   B. DIMENSIONS AND TOLERANCES: AS SPECIFIED HEREIN.

   C. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING DOCUMENTATION WITH EACH SHIPMENT.

      (1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:

   A. MATERIAL AND FINISH:

      (1) PLUG BODY: MOLDED PHENOLIC RESIN PER MIL-M-14 TYPE MFH, FOR #16 CONTACT. MOLDED PHENOLIC RESIN PER MIL-M-14 TYPE MDG, FOR #20 CONTACT.

      (2) JACKSCREW PIN, JACKSCREW SOCKET AND SPACER: CORROSION RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A PASSIVATED PER MIL-F-14072 METHOD E300.

      (3) HOOD ASSEMBLY: ALUMINUM ALLOY PER QQ-A-250A/8A WITH GOLDEN CHROMATE FINISH PER MIL-C-5541.

   B. THIS CONNECTOR PLUG SHALL BE DESIGNED FOR CONTACTS LISTED IN TABLE I.

   C. THIS CONNECTOR PLUG SHALL BE DESIGNED TO MATE WITH CONNECTOR RECEPTACLES LISTED IN TABLE I.

   D. ELECTRICAL CHARACTERISTICS: CONNECTORS SHALL HAVE THE FOLLOWING ELECTRICAL CHARACTERISTICS WHEN CONTACTS PER TABLE I ARE PROPERLY INSTALLED.

      (1) CONTACT CURRENT RATING: 7.5 AMPERES MAXIMUM FOR NO. 20 AWG CONTACTS; 13 AMPERES MAXIMUM FOR NO. 16 AWG CONTACTS.

      (2) OPERATING VOLTAGE: 750 VOLTS AC MAXIMUM, 60 CPS.

      (3) CONTACT VOLTAGE DROP: 20 MILLIVOLTS MAXIMUM AT 7.5 AMPERES MAXIMUM FOR NO. 20 AWG MACHINED CONTACTS. 23 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG MACHINED CONTACTS AND 25 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG FORMED CONTACTS.

      (4) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM WHEN TESTED PER MIL-STD-202 METHOD 302 CONDITION B BEFORE AND AFTER THE SALT SPRAY AND MOISTURE RESISTANCE TESTS SPECIFIED HEREIN.

      (5) HIGH POTENTIAL TEST: 2250 VOLTS AC, 60 CPS FOR 1 MINUTE DURATION FOR NO. 20 AWG CONTACTS; 2000 VOLTS AC, 60 CPS FOR 1 MINUTE DURATION FOR NO. 16 AWG CONTACTS.

   E. OPERATING TEMPERATURE: FROM -55°C TO +125°C.

   F. ENVIRONMENTAL TESTS: WHEN MATED WITH ITS MATING PART THE CONNECTOR SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING TESTS.

      (1) SALT SPRAY: PER MIL-STD-202 METHOD 101 CONDITION A.

      (2) MOISTURE RESISTANCE: PER MIL-STD-202 METHOD 106 FOR CONNECTORS WITH MACHINED CONTACTS AND 240 HOURS AT 40°C AND 90 TO 95% RELATIVE HUMIDITY FOR CONNECTORS WITH FORMED CONTACTS.

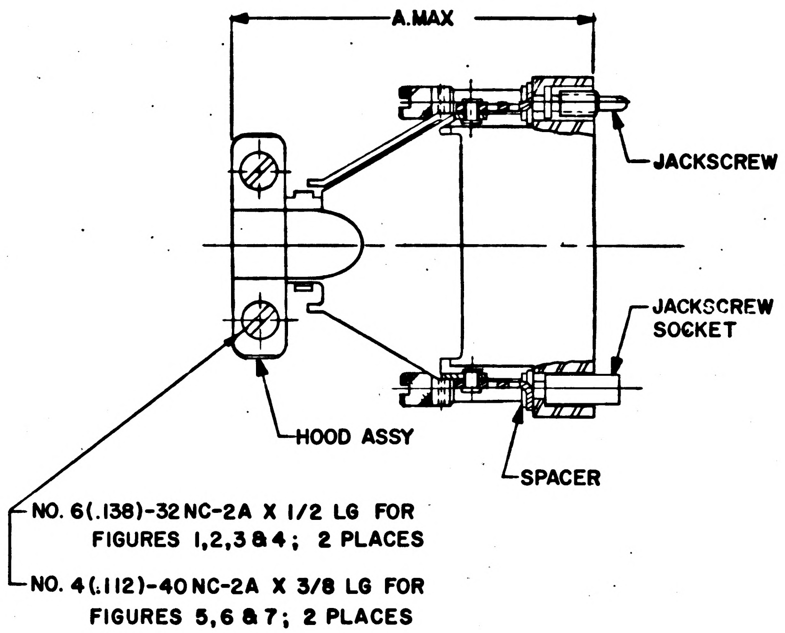
      (3) VIBRATION: PER MIL-STD-202 METHOD 204.

      (4) SHOCK: PER MIL-STD-202 METHOD 207 FOR CONNECTORS WITH NO. 16 AWG CONTACTS AND MIL-STD-202 METHOD 202A FOR CONNECTORS WITH NO. 20 AWG CONTACTS.

   G. DURABILITY: 500 CYCLES MINIMUM MATING AND UNMATING.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

1006490-015 THRU-028


A.MAX
JACKSCREW
JACKSCREW SOCKET
HOOD ASSY
SPACER
NO. 6(.138)-32NC-2A X 1/2 LG FOR FIGURES 1,2,3 & 4; 2 PLACES
NO. 4(.112)-40NC-2A X 3/8 LG FOR FIGURES 5,6 & 7; 2 PLACES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON	RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO.	NAS 9-497
DRAWN	J.T.DOTY DATE 6 JUL 65
CHECKED	W. Lyons 20 JUL 65
APPROVAL	Fraga 5 Oct 65
APPROVAL	D. O'Bryant 10/5/65
APPROVAL	M J Benza 10/1/65
NASA APPROVAL	C. METZGER
MIT APPROVAL	W Keefe 7 Dec 65
MIT APPROVAL	A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG,
ELECTRICAL

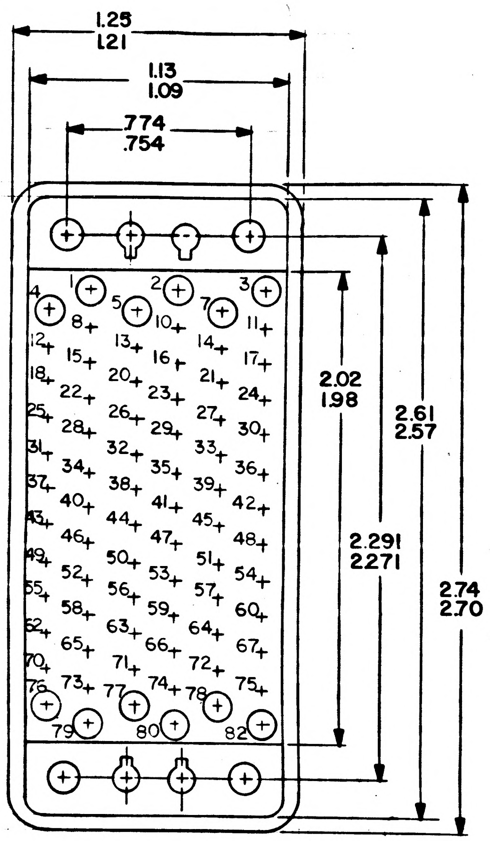
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006490
SCALE NONE	WT	SHEET 1 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

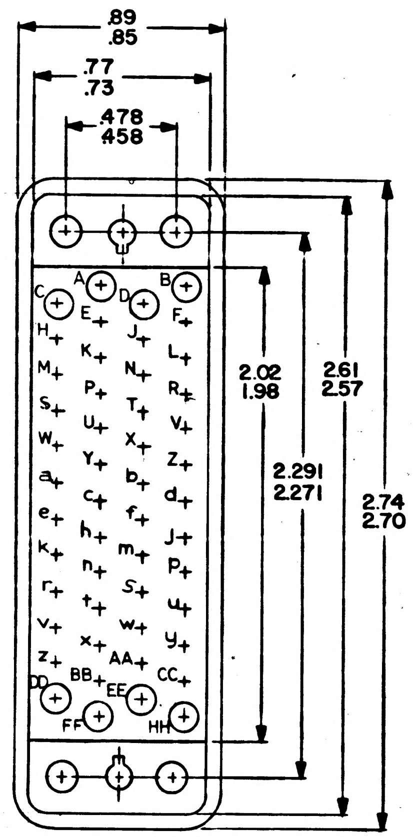
+ 1006490

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
O	RELEASED PER CCA R25270	10/21/65	A. Harano
1	CHANGED PER CCA R25539 DR [illegible] CHK Z.D. Fragin APPD W. Maynard	11/19/65	[illegible]
—	CLASS A RELEASED PER TDRR 24524		



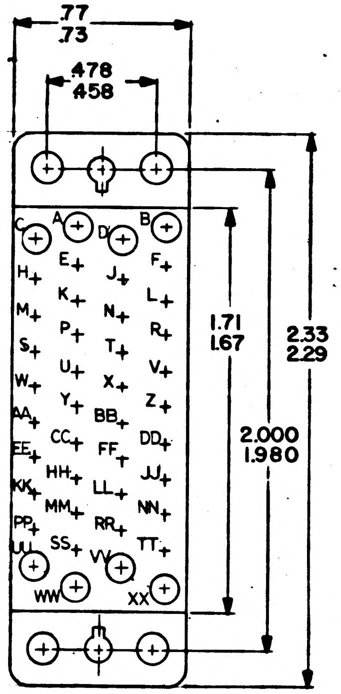
1.25
1.21
1.13
1.09
.774
.754
2.02
1.98
2.61
2.57
2.291
2.271
2.74
2.70

FIGURE 1.



.89
.85
.77
.73
.478
.458
2.02
1.98
2.61
2.57
2.291
2.271
2.74
2.70

FIGURE 2



.77
.73
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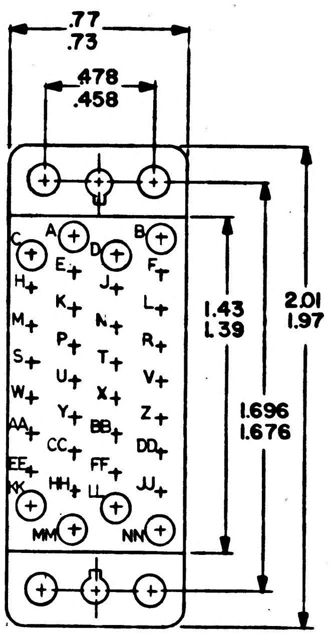
.458
1.71
1.67
2.33
2.29
2.000
1.980

FIGURE 3



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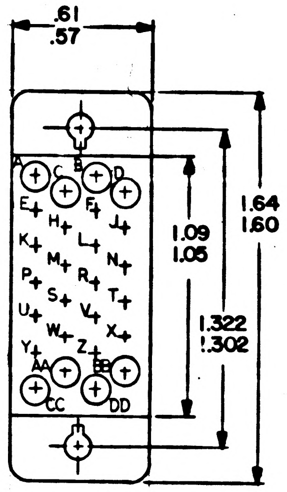
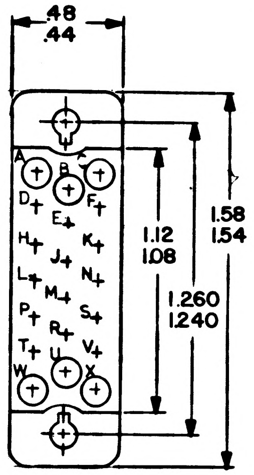
.73
.478
.458
1.43
1.39
2.01
1.97
1.696
1.676

FIGURE 4



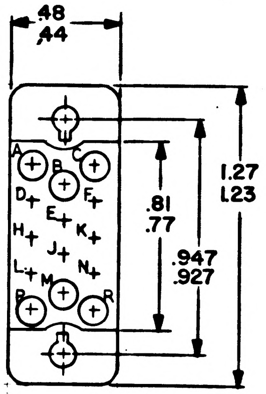
.61
.57
1.09
1.05
1.64
1.60
1.322
1.302

FIGURE 5



.48
.44
1.12
1.08
1.58
1.54
1.260
1.240

FIGURE 6



.48
.44
.81
.77
1.27
1.23
.947
.927

FIGURE 7

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
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APPROVAL M J Barnes 10/21/65
NASA APPROVAL A. G. METZGER
MIT APPROVAL W [illegible] 7 Dec 65
MIT APPROVAL A Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006490
SCALE NONE	WT	SHEET 2 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

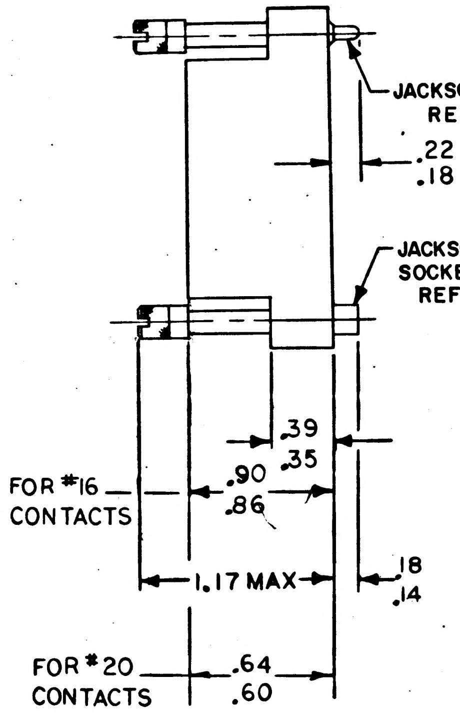
—	1006490

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
O	RELEASED PER CCA R25270	10/21/65	A Harano
/	CHANGED PER CCA R25539 DR P. Milard CHK L.D Fagan APPD H Maynard	11/19/65	
—	CLASS A RELEASED PER TDRR 24524		

TABLE I

DASH NUMBERS WITHOUT HOOD	DASH NUMBERS WITH HOOD	CONTACT SIZE AWG	NO. OF CONTACT POSITIONS	DIMENSION A MAX	CONTACTS SEE NOTE 3.B.	MATING RECEPTACLE SEE NOTE 3.C.
-001	-015	20	75 FIG. 1	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-001,
-002	-016	16	75 FIG. 1	2.230	1006491-009, -010, -011, -012	1006494-002
-003	-017	20	50 FIG. 2	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-003
-004	-018	16	50 FIG. 2	2.230	1006491-009, -010, -011, -012	1006494-004
-005	-019	20	42 FIG. 3	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-005
-006	-020	16	42 FIG. 3	2.230	1006491-009, -010, -011, -012	1006494-006
-007	-021	20	34 FIG. 4	2.230	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-007
-008	-022	16	34 FIG. 4	2.230	1006491-009, -010, -011, -012	1006494-008
-009	-023	20	26 FIG. 5	1.915	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-009
-010	-024	16	26 FIG. 5	1.915	1006491-009, -010, -011, -012	1006494-010
-011	-025	20	20 FIG. 6	1.915	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-011
-012	-026	16	20 FIG. 6	1.915	1006491-009, -010, -011, -012	1006494-012
-013	-027	20	14 FIG. 7	1.915	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006494-013
-014	-028	16	14 FIG. 7	1.915	1006491-009, -010, -011, -012	1006494-014

PLUG ONLY
1006490-001 THRU -014



HOOD ONLY
1006490 -029 THRU -035

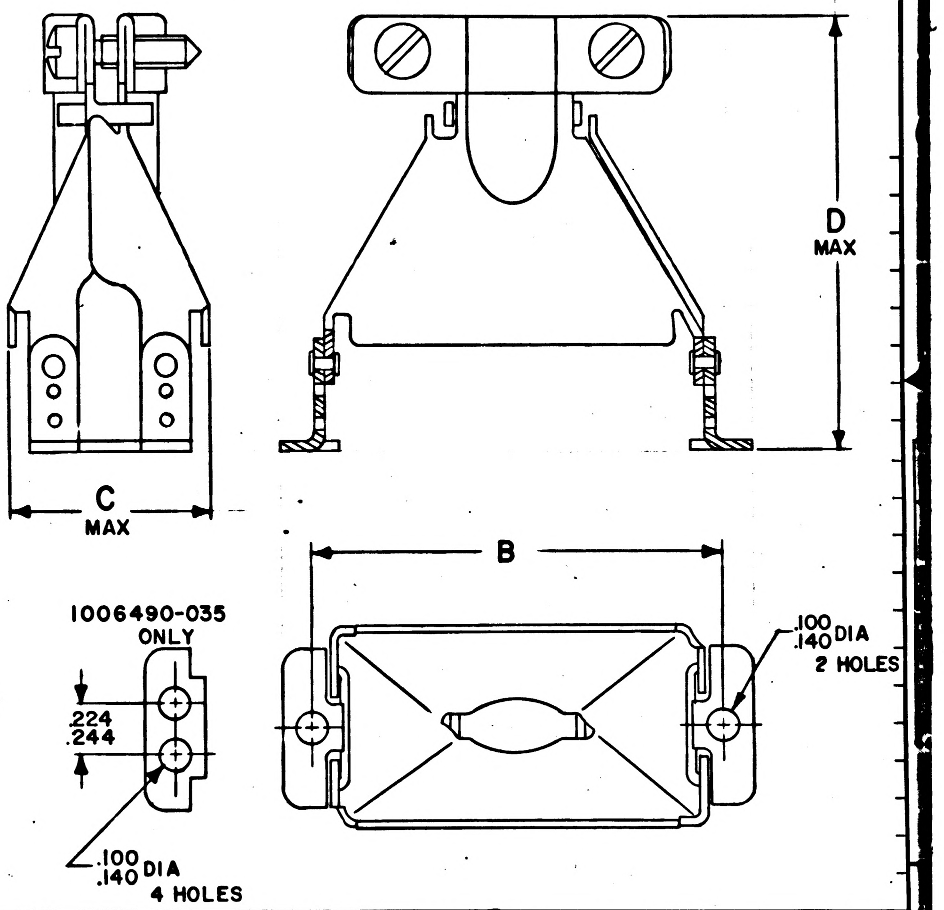


TABLE II

DASH NO.	DIMENSIONS B	DIMENSIONS C	DIMENSIONS D	PART OF
-029	.96 .92	.583 .573	1.555 1.545	-027 -028
-030	1.27 1.23	.583 .576	1.555 1.545	-025 -026
-031	1.33 1.29	.715 .705	1.555 1.545	-023 -024
-032	1.71 1.67	.880 .870	1.870 1.860	-021 -022
-033	2.01 1.97	.880 .870	1.870 1.860	-019 -020
-034	2.30 2.26	.880 .870	1.870 1.860	-017 -018
-035	2.30 2.26	1.255 1.245	1.870 1.860	-015 -016

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J.T. DOTY DATE 6 JUL 65
CHECKED W. Lyons 20 JUL 65
APPROVAL 5 Oct 65
APPROVAL D. S Bryant 10/5/65
APPROVAL M. J. Barrie 10/1/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W Kupfer 7 Dec 65
MIT APPROVAL A Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006490
SCALE NONE	WT	SHEET 3 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

— | 1006491

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

B. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.

(1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE.

A. MARKING: PER NOTE 1.B. AND 1.B.(1).

B. DIMENSIONS AND TOLERANCES: AS SPECIFIED IN FIGURES AND TABLE I.

C. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING DOCUMENTATION WITH EACH SHIPMENT.

(1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:

A. MATERIAL AND FINISH:

(1) CONTACT BODY: BRASS PER QQ-B-626 COMPOSITION 22 OR ASTM ALLOY B140, GOLD PLATED PER MIL-G-45204 TYPE II, CLASS 1.

(2) RETAINING AND INNER CONTACT SPRINGS: BERYLLIUM COPPER PER QQ-C-533 NICKEL PLATED PER QQ-N-290 CLASS 2.

B. CRIMP JOINT CHARACTERISTIC: CONTACTS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-22857 FOR MACHINED CONTACTS.

C. CONTACTS SPECIFIED HEREIN SHALL BE DESIGNED FOR USE IN CONNECTORS AS LISTED IN TABLE I.

D. ELECTRICAL CHARACTERISTICS: CONTACTS SHALL HAVE THE FOLLOWING ELECTRICAL CHARACTERISTICS WHEN CONTACTS ARE PROPERLY INSTALLED.

(1) CONTACT CURRENT RATING: 7.5 AMPERES MAXIMUM FOR NO. 20 AWG CONTACTS, 13 AMPERES MAXIMUM FOR NO. 16 AWG CONTACTS.

(2) OPERATING VOLTAGE: 750 VOLTS AC MAXIMUM, 60 CPS.

(3) CONTACT VOLTAGE DROP: 20 MILLIVOLTS MAXIMUM AT 7.5 AMPERES MAXIMUM FOR NO. 20 AWG MACHINED CONTACTS, 23 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG MACHINED CONTACTS AND 25 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG FORMED CONTACTS.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

CONTACTS

DASH NO.	FIG. NO.	DIMENSIONS L	DIMENSIONS O.D.	CABLE ACCOM. INSUL DIA	CABLE ACCOM. STRIP LENGTH	WIRE SIZE AND TYPE ACCOM.	CONNECTOR SEE NOTE 3.C.
-001	1	.79 .75	.126 .116	.066 MAX	.173 .203	30 AWG INNER CONDUCTOR OF RG187/u	1006490-001, -003, -005, -007, -009, -011, -013, -015, -017, -019, -021, -023, -025, AND -027. 1006494-001, -003, -005, -007, -009, -011, -013,
-002	2	.58 .54					
-003	1	.79 .75		.058 .035	.173 .203	24 AWG SOLID PER MIL-W-76	
-004	2	.58 .54					
-005	1	.79 .75	.123 .113	.078 .054	.173 .203	20 AWG TO 18 AWG PER MIL-W-16878	
-006	2	.58 .54					
-007	1	.79 .75	.126 .116	.092 .072	.173 .203	18 AWG PER MIL-W-76	
-008	2	.58 .54					
-009	3	1.04 1.00	.106 .096	.062 .035	.173 .203	26 TO 24 AWG PER MIL-W-16878 OR 24 AWG PER MIL-W-76	1006490-002, -004, -006, -008, -010, -012, -014, -016, -018, -020, -022, -024, -026, AND -028. 1006494-002, -004, -006, -008, -010, -012, -014, [illegible]
-010	4	.73 .69					
-011	5	1.04 1.00	.121 .111	.090 .060	.173 .203	22 TO 20 AWG PER MIL-W-16878, MIL-W-76 OR MIL-W-5086	
-012	6	.73 .69					

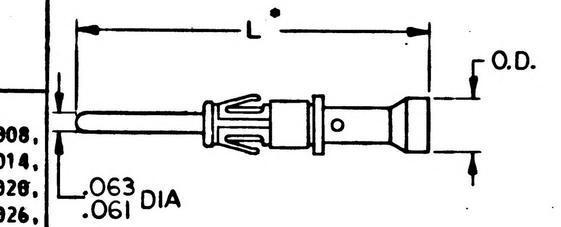


FIGURE 3

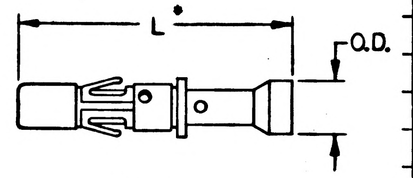


FIGURE 4

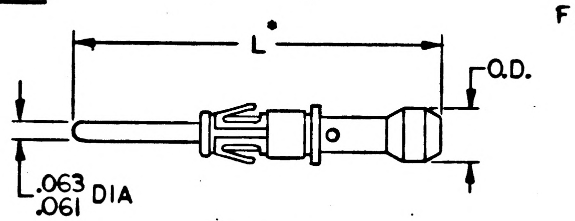


FIGURE 5

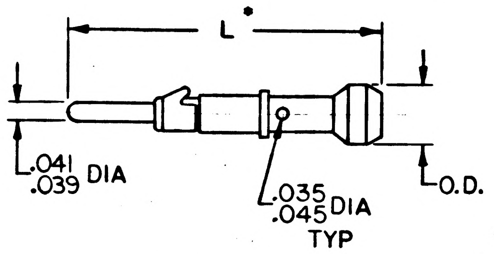


FIGURE 1

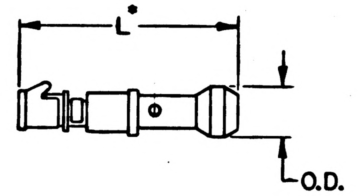


FIGURE 2

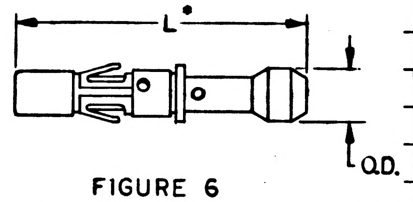


FIGURE 6

* CONTACT SHALL BE STRAIGHT WITHIN .005

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25108		
1	CHANGED PER CCA R25433 DR H. Wong CHK APPD	11-4-65	
—	RELEASED CLASS A PER TDRR 24524		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ±
DECIMALS .XXX ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DATE 15 JUL 65
CHECKED A. Kufen 14 AUG 65
APPROVAL 8/16/65 12/4/65
APPROVAL 8/18/65
APPROVAL 18 Aug 65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7 Dec 65
MIT APPROVAL 8/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006491
SCALE NONE	WT	SHEET 1 OF 2

1006491 —

— 1006491

SYM	DESCRIPTION	DATE	APPROVED
REVISIONS			
1	THIS SHEET ADDED PER CCA R25433	11-4-65	J.F.D
—	RELEASED CLASS A PER TDRR 24524		

TABLE I (CONTINUED)

DASH NO.	FIG. NO.	DIMENSIONS L	DIMENSIONS OD	CABLE ACCOM INS DIA	CABLE ACCOM STRIP LG	WIRE SIZE AND TYPE ACCOMODATED	CONNECTOR SEE NOTE 3.C.
-013	9	1.04 1.00	.106 .096	-	.203 .173	NO. 20-16 AWG PER MIL-W-76, MIL-W-5086, OR MIL-W-16878	1006490-002, -004, -006, -008, -010, -012, -014, -016, -018, -020, -022, -024, -026, -028
-014	10	.73 .69					
-017	1	.79 .75	.126 .116	.072 .052	.203 .173	(2) NO. 26-24 AWG PER MIL-W-16878 (2) NO. 24 AWG (SOLID) PER MIL-W-76 NO. 22 AWG PER MIL-W-76 OR MIL-W-5086 NO. 22-20 AWG PER MIL-W-16878	1006494-002, -004, -006, -008, -010, -012, -014
-018	2	.58 .54					
-015	7	.79 .75	.106 .096	-	.203 .173	NO. 20-16 AWG PER MIL-W-76, MIL-W-5086, OR MIL-W-16878	1006490-001, -003, -005, -007, -009, -011, -013, -015, -017, -019, -021, -023, -025, -027. 1006494-001, -003, -005, -007, -009, -011, -013.
-016	8	.58 .54					

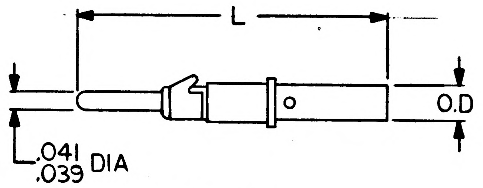


FIGURE 7.

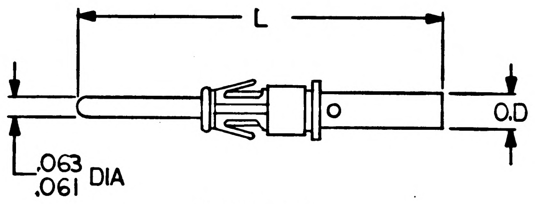


FIGURE 9

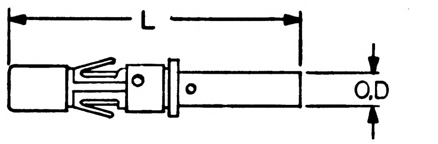


FIGURE 10

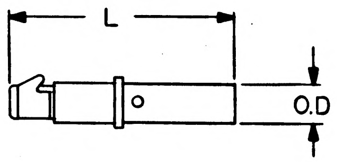


FIGURE 8

① THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±
DECIMALS .xxx ±
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN Jim Doty DATE 7 OCT 65
CHECKED F.P. Fuqua 12 OCT 65
APPROVAL P. Fraggia 28 OCT 65
APPROVAL D. O'Bryant 10/28/65
APPROVAL 10/28/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W Kupfer 7 Dec 65
MIT APPROVAL G. Varano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 49956
NASA DRAWING NO. 1006491
SCALE NONE
WT
SHEET 2 OF 2

1006491

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MODERN BLUE PRINT CO., INC. 02089

-	1006494

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25270	10/21/65	A. Harano
1	REVISED PER CCA R25521 DR A. J. Biron CHK A. Kupfer APPD	18 NOV 65	S.T.S.
-	RELEASED CLASS A PER TDRR 24524		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.

   B. MARKING: CONNECTORS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND PART NUMBER, THE NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), REVISION LETTER AND CONTACT DESIGNATION.

   C. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215 CLASS I, CODE 3.

      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE.

   A. MARKING: PER NOTE 1.B., 1.C., AND 1.C.(1).

   B. DIMENSIONS AND TOLERANCES: AS SPECIFIED HEREIN.

   C. VENDOR SUPPLIED DATA: THE VENDOR SHALL SUPPLY THE FOLLOWING DOCUMENTATION WITH EACH SHIPMENT.

      (1) CERTIFICATE OF COMPLIANCE WITH THE DESIGN REQUIREMENTS SPECIFIED HEREIN.

3. DESIGN:

   A. MATERIAL AND FINISH:

      (1) RECEPTACLE BODY: MOLDED PHENOLIC RESIN PER MIL-M-14 TYPE MFH, FOR #16 CONTACT. MDG PER MIL-M-14 FOR #20 CONTACT.

      (2) KEYED JACKSCREW PIN, KEYED JACKSCREW SOCKET, HEXAGON NUT AND WASHER: CORROSION RESISTING STEEL PER QQ-S-763 CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 TYPE I, METHOD E300.

   B. THIS CONNECTOR RECEPTACLE SHALL BE DESIGNED FOR CONTACTS LISTED IN TABLE I.

   C. THIS CONNECTOR RECEPTACLE SHALL BE DESIGNED TO MATE WITH CONNECTOR PLUGS LISTED IN TABLE I.

   D. ELECTRICAL CHARACTERISTICS: CONNECTORS SHALL HAVE THE FOLLOWING ELECTRICAL CHARACTERISTICS WHEN CONTACTS PER TABLE I ARE PROPERLY INSTALLED.

      (1) CONTACT CURRENT RATING: 7.5 AMPERES MAXIMUM FOR NO. 20 AWG CONTACTS; 13 AMPERES MAXIMUM FOR NO. 16 AWG CONTACTS.

      (2) OPERATING VOLTAGE: 750 VOLTS AC MAXIMUM, 60 CPS.

      (3) CONTACT VOLTAGE DROP: 20 MILLIVOLTS MAXIMUM AT 7.5 AMPERES MAXIMUM FOR NO. 20 AWG MACHINED CONTACTS. 23 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG MACHINED CONTACTS AND 25 MILLIVOLTS MAXIMUM AT 13 AMPERES MAXIMUM FOR NO. 16 AWG FORMED CONTACTS.

      (4) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM WHEN TESTED PER MIL-STD-202 METHOD 302 CONDITION B, BEFORE AND AFTER THE SALT SPRAY AND MOISTURE RESISTANCE TESTS SPECIFIED HEREIN.

      (5) HIGH POTENTIAL TEST: 2250 VOLTS AC, 60 CPS FOR 1 MINUTE DURATION FOR NO. 20 AWG CONTACTS; 2000 VOLTS AC, 60 CPS FOR 1 MINUTE DURATION FOR NO. 16 AWG CONTACTS.

   E. OPERATING TEMPERATURE: FROM -55°C TO +125°C.

   F. ENVIRONMENTAL TESTS: WHEN MATED WITH ITS MATING PART THE CONNECTOR SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING TESTS:

      (1) SALT SPRAY: PER MIL-STD-202 METHOD 101 CONDITION A.

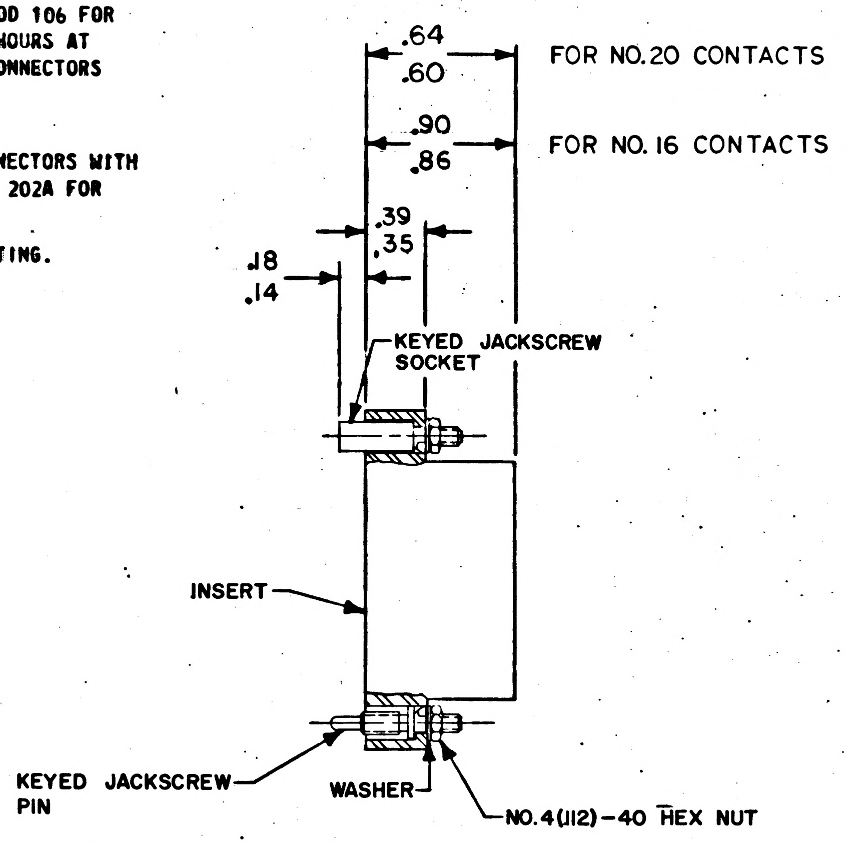
      (2) MOISTURE RESISTANCE: PER MIL-STD-202 METHOD 106 FOR CONNECTORS WITH MACHINED CONTACTS AND 240 HOURS AT 40°C AND 90 TO 95% RELATIVE HUMIDITY FOR CONNECTORS WITH FORMED CONTACTS.

      (3) VIBRATION: PER MIL-STD-202 METHOD 204.

      (4) SHOCK: PER MIL-STD-202 METHOD 207 FOR CONNECTORS WITH NO. 16 AWG CONTACTS AND MIL-STD-202 METHOD 202A FOR CONNECTORS WITH NO. 20 AWG CONTACTS.

   G. DURABILITY: 500 CYCLES MINIMUM MATING AND UNMATING.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.



MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON

DECIMALS	DECIMALS	ANGLES
.xx ±	.xxx ±	±

DO NOT SCALE DRAWING

MATERIAL

SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J. Doty DATE 1 JULY65
CHECKED R. Whiting 9 AUG 65
APPROVAL P. Feyen 3 Oct 65
APPROVAL D. O. Bryant 10/5/65
APPROVAL A. J. Biron 10/1/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Kupfer 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006494
SCALE NONE	WT	SHEET 1 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

—	1006494

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25270	10/21/65	A. Harano
1	REVISED PER CCA R25521 DR A. J. Brown CHK A. Kuper APPD Handley	18 Nov 65	S.F.S.
-	RELEASED CLASS A PER TDRR 24524		

TABLE I

DASH NO.	CONTACT SIZE AWG	NO. OF CONTACT POSITION	CONTACTS SEE NOTE 3.B.	MATING PLUG SEE NOTE 3.C.
-001	20	75 FIG. 1	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006490-001
-002	16	75 FIG. 1	1006491-009, -010, -011, -012	1006490-002
-003	20	50 FIG. 2	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006490-003
-004	16	50 FIG. 2	1006491-009, -010, -011, -012	1006490-004
-005	20	42 FIG. 3	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006490-005
-006	16	42 FIG. 3	1006491-009, -010 -011, -012	1006490-006
-007	20	34 FIG. 4	1006491-001, -002 -003, -004, -005, -006, -007, -008	1006490-007
-008	16	34 FIG. 4	1006491-009, -010, -011, -012	1006490-008
-009	20	26 FIG. 5	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006490-009
-010	16	26 FIG. 5	1006491-009, -010, -011, -012	1006490-010
-011	20	20 FIG. 6	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006490-011
-012	16	20 FIG. 6	1006491-009, -010, -011, -012	1006490-012
-013	20	14 FIG. 7	1006491-001, -002, -003, -004, -005, -006, -007, -008	1006490-013
-014	16	14 FIG. 7	1006491-009, -010 -011, -012	1006490-014

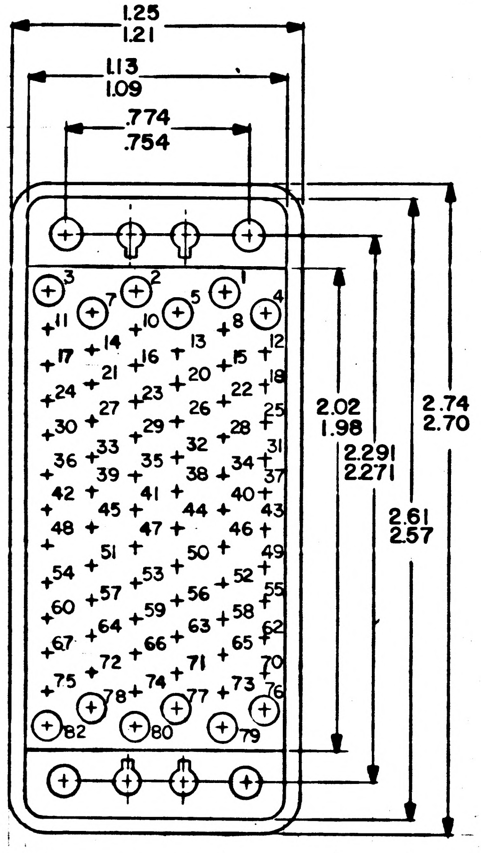

1.25
1.21
1.13
1.09
.774
.754
2.02
1.98
2.291
2.271
2.74
2.70
2.61
2.57

FIGURE 1

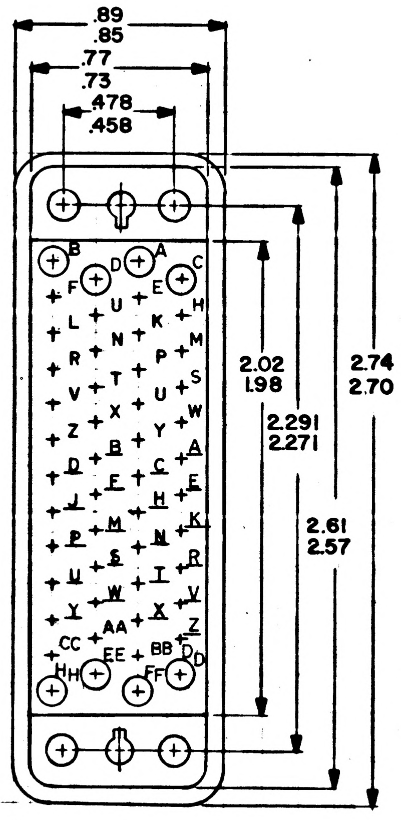

.89
.85
.77
.73
.478
.458
2.02
1.98
2.291
2.271
2.74
2.70
2.61
2.57

FIGURE 2

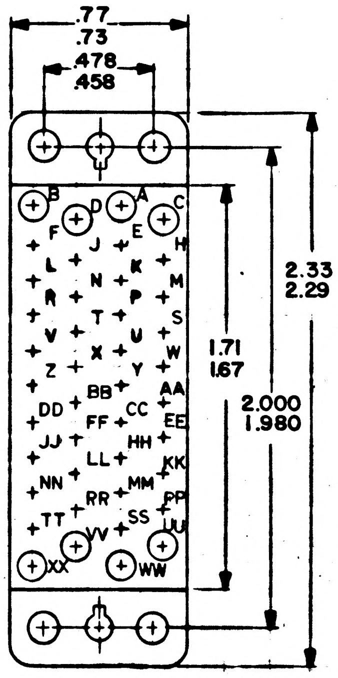

.77
.73
.478
.458
1.71
1.67
2.000
1.980
2.33
2.29

FIGURE 3

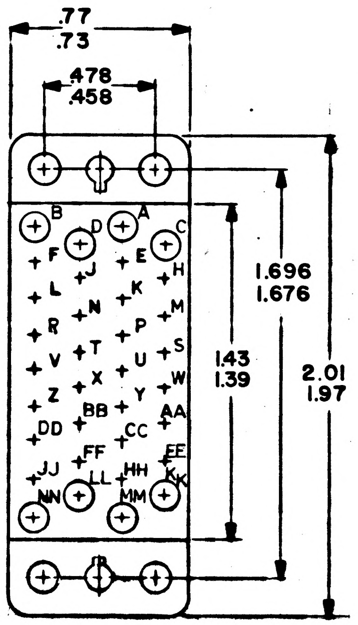

.77
.73
.478
.458
1.696
1.676
1.43
1.39
2.01
1.97

FIGURE 4

NOTE: LETTERS UNDERLINED IN FIGURE 2 INDICATE LOWER CASE LETTERS.

CONTACT DESIGNATION SHOWN ARE ON THE WIRING SIDE OF THE RECEPTACLE.

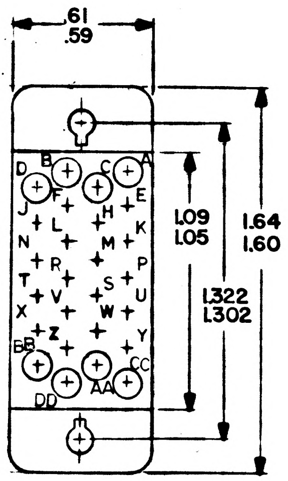

.61
.59
1.09
1.05
1.64
1.60
1.322
1.302

FIGURE 5

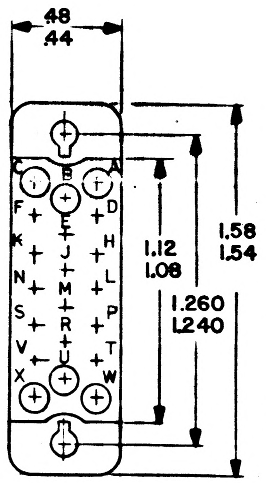

.48
.44
1.12
1.08
1.58
1.54
1.260
1.240

FIGURE 6

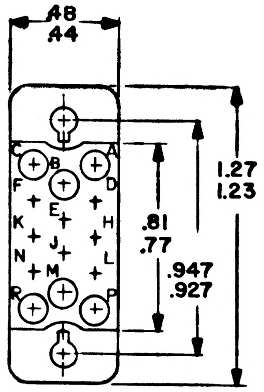

.48
.44
.81
.77
.947
.927
1.27
1.23

FIGURE 7

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ± DECIMALS .xxx ± ANGLES ±

DO NOT SCALE DRAWING

MATERIAL
SEE NOTE

NEXT ASSY	USED ON
APPLICATION	

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN J. Doty DATE 1 JULY65
CHECKED R. Martin 9 AUG 65
APPROVAL 3 Oct 65
APPROVAL D. O'Bryant 10/5/65
APPROVAL 10.6.65
NASA APPROVAL A. C. METZGER
MIT APPROVAL
MIT APPROVAL A. Harano 12/16/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956 | SIZE C | NASA DRAWING NO. 1006494
SCALE NONE | WT | SHEET 2 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

— 1006494

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	RELEASED PER CCA R25270	10/6/65	A. Harano
1	REVISED PER CCA R25521 DR G. J. Biron CHK A. Kufer APPD	18 Nov 65	
-	RELEASED CLASS A PER TDRR 24524		

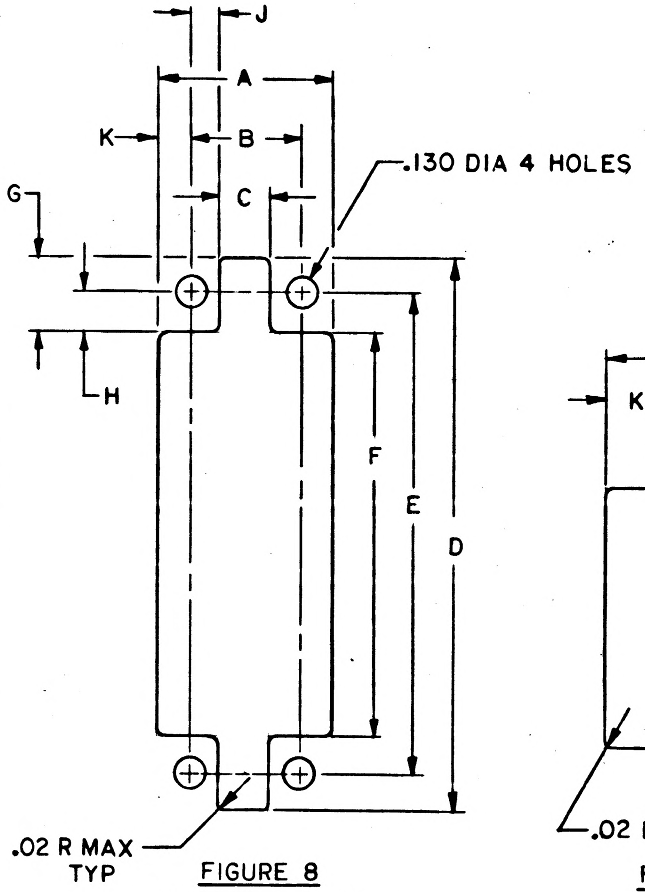


FIGURE 8
FOR FIG 1 THRU 4

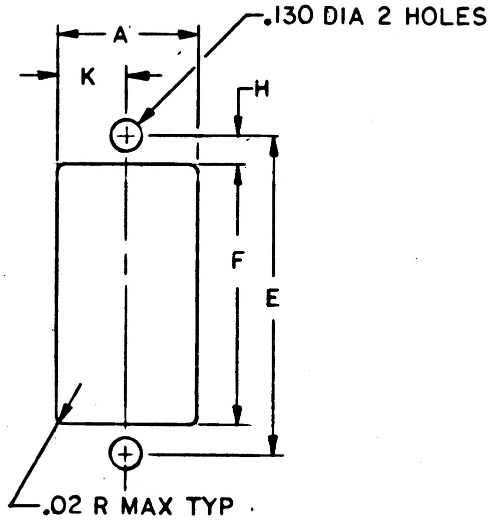


FIGURE 9
FOR FIG 5

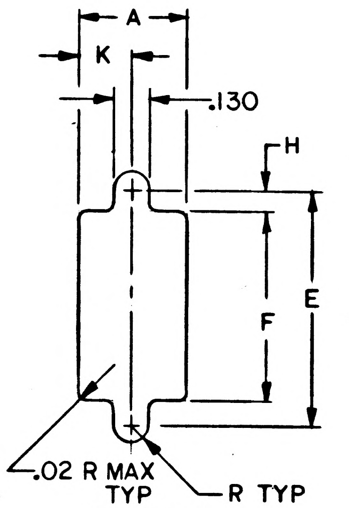


FIGURE 10
FOR FIG 5,6 AND 7

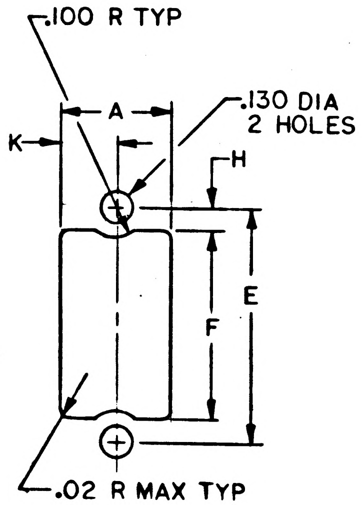


FIGURE 11
FOR FIG 6 AND 7

TABLE III

MOUNTING CUTOUT	CONNECTOR	DIMENSIONS									
		A	B	C	D	E	F	G	H	J	K
FIG. 8	FIG. 1	1.150 1.140	.769 .759	.565 .555	2.535 2.525	2.286 2.276	2.035 2.025	.255 .245	.130 .120	.107 .097	.195 .185
FIG. 8	FIG. 2	.785 .775	.473 .463	.255 .245	2.535 2.525	2.286 2.276	2.035 2.025	.255 .245	.130 .120	.114 .104	.161 .151
FIG. 8	FIG. 3	.785 .775	.473 .463	.255 .245	2.245 2.235	1.995 1.985	1.725 1.715	.265 .255	.140 .130	.114 .104	.161 .151
FIG. 8	FIG. 4	.785 .775	.473 .463	.255 .245	1.945 1.935	1.693 1.683	1.445 1.435	.255 .245	.129 .119	.114 .104	.161 .151
FIG. 9 OR FIG. 10	FIG. 5	.625 .615	-	-	-	1.317 1.307	1.115 1.105	-	.106 .096	-	.315 .305
FIG. 10 OR FIG. 11	FIG. 6	.495 .485	-	-	-	1.255 1.245	1.135 1.125	-	.065 .055	-	.250 .240
FIG. 10 OR FIG. 11	FIG. 7	.495 .485	-	-	-	.942 .932	.825 .815	-	.063 .053	-	.250 .240

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .xx ±
DECIMALS .xxx ±.005
ANGLES ±

DO NOT SCALE DRAWING

MATERIAL

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-497
DRAWN H. Wong DATE 22 Sep 65
CHECKED C. Kesler 28 Sep 65
APPROVAL 30 S 65
APPROVAL D. O'Bryant 10/5/65
APPROVAL 10/1/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Kupfer 7 Dec 65
MIT APPROVAL A. Harano 12/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 49956
NASA DRAWING NO. 1006494
SCALE NONE
WT
SHEET 3 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

MODERN BLUE PRINT CO., INC. 02089

–	1006495

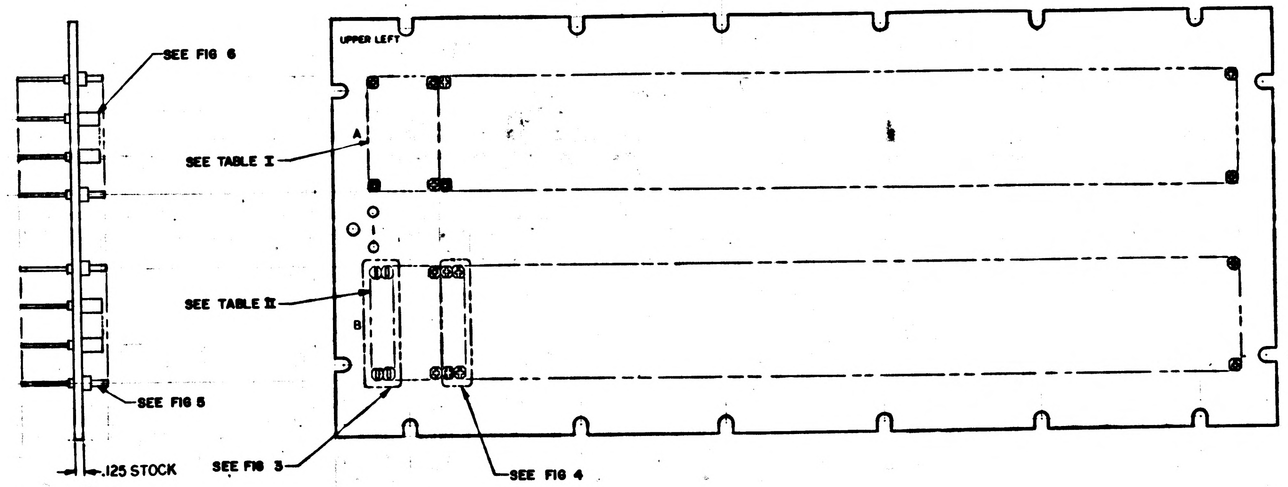
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
0	~~CLASS A~~ RELEASE PER ~~TDRR~~ CCA R25067		
-	CLASS A RELEASE PER TDRR 21936		

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MIL-Q-9858.
   - B. PART MARKING: PLATES SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE PLATE ORIENTATION, TERMINAL IDENTIFICATION, AND NASA PART NUMBER (DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER) AS DELINEATED HEREIN. UNLESS OTHERWISE SPECIFIED, MARK 0.08 HIGH NORMAL GOTHIC CHARACTERS USING BLACK INK PER 1006271-10.
   - C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.
   - D. SUPPLIER SHALL CONFORM TO ND 1002136.

2. ACCEPTANCE AND INSPECTION (SAMPLING):
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: AS DELINEATED HEREIN.
     - (2) CONTACT, INSULATOR, AND GROUNDING SLEEVE RETENTION: AFTER ASSEMBLY (FULL INSERTION) OF ALL PARTS; THE CONTACTS, INSULATORS AND GROUNDING SLEEVES SHALL WITHSTAND A MINIMUM PUSHOUT LOAD, IN EITHER DIRECTION, OF 20 POUNDS APPLIED UNIFORMLY AT THE RATE OF ONE POUND PER SECOND.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) RESISTANCE TO GROUND (PLATE TO PIN) OF ALL GROUND PINS SHALL NOT EXCEED .2 OHMS @ 1.0 AMP TEST CURRENT.
     - (2) INSULATION RESISTANCE (PLATE TO EACH INSULATED PIN): 100,000 MEGOHMS MINIMUM WHEN TESTED PER MIL-STD-202, METHOD 302, CONDITION B.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 500 VRMS AT 60 CPS OR 600 VDC WHEN TESTED PER MIL-STD-202, METHOD 301.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN REQUIREMENTS:
   - A. MECHANICAL:
     - (1) GROUNDING SLEEVE, MALE SHALL BE NASA PART 1006402-001.
     - (2) GROUNDING SLEEVE, FEMALE SHALL BE NASA PART 1006403-001.
     - (3) CONTACT, WRAPOST, MALE, NASA PART 1006996-5.
     - (4) INSULATOR, WRAPOST, MALE, (WHITE) NASA PART 1010303-1.
     - (5) INSULATOR, BUSHING, FEMALE (WHITE) WRAPOST, NASA PART 1010300.
     - (6) CONTACT, WRAPOST, FEMALE, NASA PART 1010379-5
   - B. ELECTRICAL:
     - (1) CONTACT RESISTANCE (PLATE TO EACH GROUNDING PIN): 5.0 MILLIOHMS @ 1.0 AMP TEST CURRENT.
   - C. MATERIAL & FINISH: MOUNTING PLATE
     - (1) MOUNTING PLATE: 1100-H34 ALUMINUM ALLOY PER QQ-A-250/1 WITH AN ELECTRICALLY CONDUCTIVE CHROMATE FILM PER MIL-C-5541.
   - D. CONNECTOR BLADE OF MALE PIN SHALL BE VERTICAL WITHIN ± 1° FROM VERTICAL TO MOUNTING PLATE SURFACE



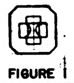


FIGURE 1
FEMALE CONTACT
ORIENTATION

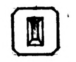


FIGURE 2
MALE CONTACT
ORIENTATION

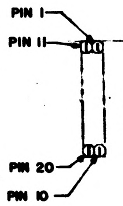


FIGURE 3
MALE CONTACT GROUP(M)
SEE FIGURE 2

TABLE I

PART NO.	CONTACT GROUP PIN ARRANGEMENT																																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
-001	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	SEE NOTE 1
-002	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	SEE NOTE 1
-003	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	-	-	-	-	-	-	-	SEE NOTE 1
-004	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	SEE NOTE 1 & 3
-005	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	SEE NOTE 1

TABLE II

PART NO.	CONTACT GROUP PIN ARRANGEMENT																																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
-001	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	SEE NOTE 1
-002	M	M	M	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	M	M	M	M	M	M	SEE NOTE 1
-003	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	-	-	-	-	-	-	-	SEE NOTE 1
-004	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	SEE NOTE 1 & 2
-005	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	SEE NOTE 1

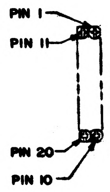


FIGURE 4
FEMALE CONTACT GROUP (F)
SEE FIGURE 1

TABLE NOTES:

1. PIN 20 OF EVERY 20 PIN GROUPING PER FIG. 3 OR 4 SHALL BE GROUNDING SLEEVE.
2. SAME AS -001 EXCEPT INSULATOR BUSHING IN POSITION B33-20, B34-20, B35-20.
3. SAME AS -001 EXCEPT INSULATOR BUSHING IN POSITION A33-20, A34-20 & A35-20.

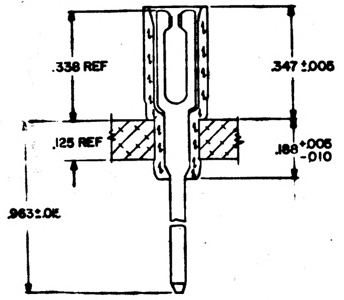


FIGURE 6 FEMALE PIN & INSULATOR OR GROUNDING SLEEVE ASSY DIMENSIONS.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR LIST.

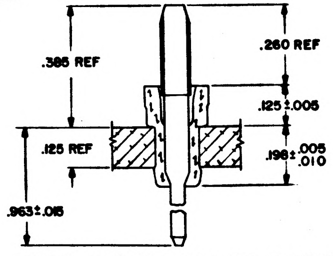


FIGURE 5 MALE PIN & INSULATOR OR GROUNDING SLEEVE ASSY DIMENSIONS

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE 3C

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN DATE 12 JUN 65
CHECKED 29 JUN 65
APPROVAL H. Mo 30 JUL 65
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE WRAP PLATE

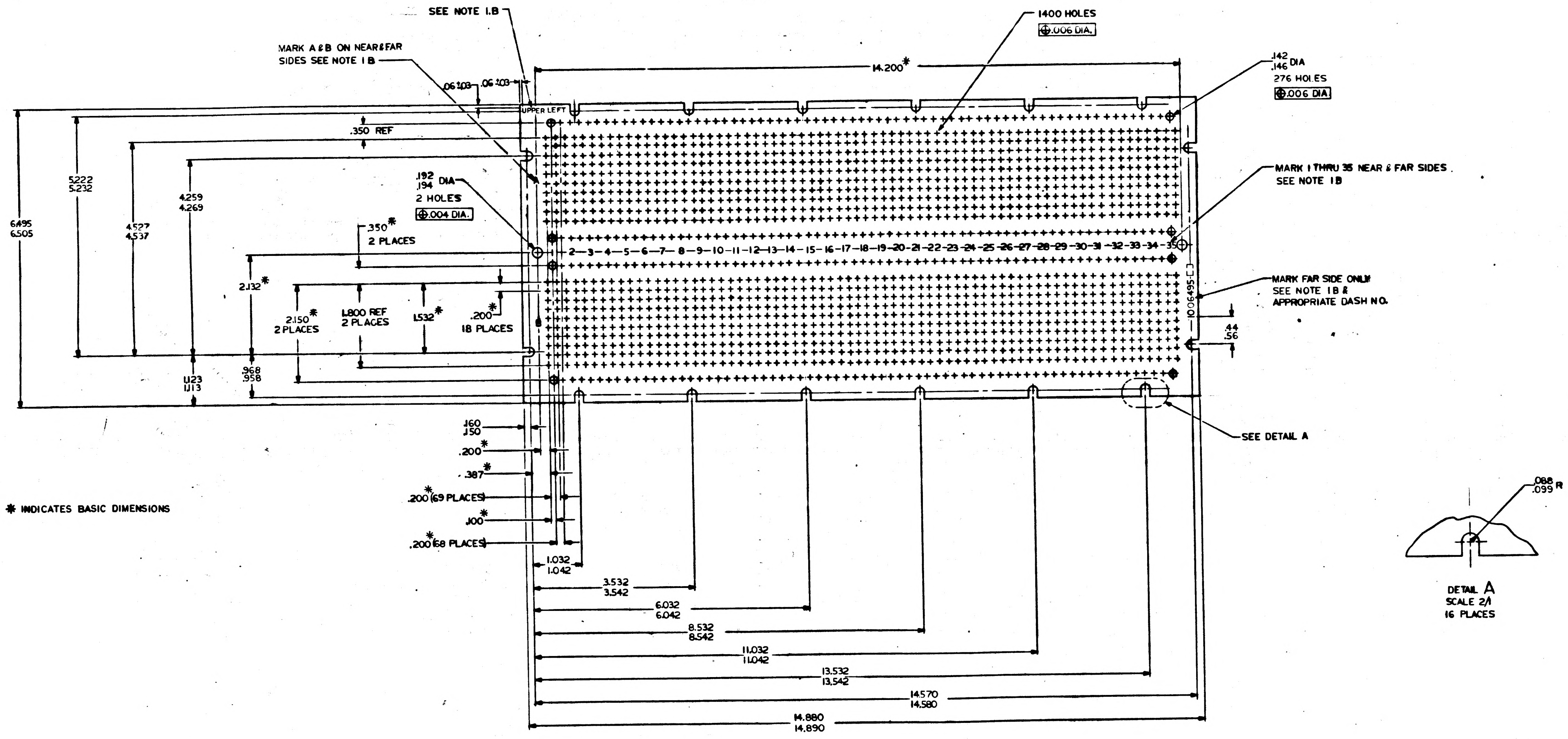
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE F
NASA DRAWING NO. 1006495
SCALE 1/1
WT
SHEET 1 OF 2

1006495
B

-	1006495

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
O	~~CLASS A~~ RELEASE PER ~~TDRR~~ CCA R-5067		
-	CLASS A RELEASE PER TDRR 21936		



SEE NOTE 1.B
MARK A & B ON NEAR & FAR SIDES SEE NOTE 1 B
.06 ±.03
.06 ±.03
UPPER LEFT
14.200*
1400 HOLES
⊕.006 DIA.
.142
.146 DIA
276 HOLES
⊕.006 DIA
.350 REF
5.222
5.232
6.495
6.505
4.527
4.537
4.259
4.269
.192
.194 DIA
2 HOLES
⊕.004 DIA.
.350*
2 PLACES
2.132*
2.150*
2 PLACES
1.800 REF
2 PLACES
1.532*
.200*
18 PLACES
1.123
1.113
.968
.958
2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35
MARK 1 THRU 35 NEAR & FAR SIDES. SEE NOTE 1B
1006495-☐
MARK FAR SIDE ONLY SEE NOTE 1B & APPROPRIATE DASH NO.
.44
.56
SEE DETAIL A
.160
.150
.200*
.387*
.200* (69 PLACES)
.100*
.200* (68 PLACES)
1.032
1.042
3.532
3.542
6.032
6.042
8.532
8.542
11.032
11.042
13.532
13.542
14.570
14.580
14.880
14.890
.088
.099 R
DETAIL A
SCALE 2/1
16 PLACES

* INDICATES BASIC DIMENSIONS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
DECIMALS .XX ± DECIMALS .XXX ± ANGLES ±
DO NOT SCALE DRAWING
MATERIAL
SEE NOTE 3C

RAYTHEON RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. FNP-12775
DRAWN J. Doty DATE 11 JUN 65
CHECKED J. [illegible] 25 JUN 65
APPROVAL [illegible] 6/30/65
APPROVAL [illegible] 7/1/65
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 7-25-65
MIT APPROVAL [illegible] 7/20/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE WRAP PLATE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	F	1006495
SCALE 1/1	WT	SHEET 2 OF 2

1006495 | -

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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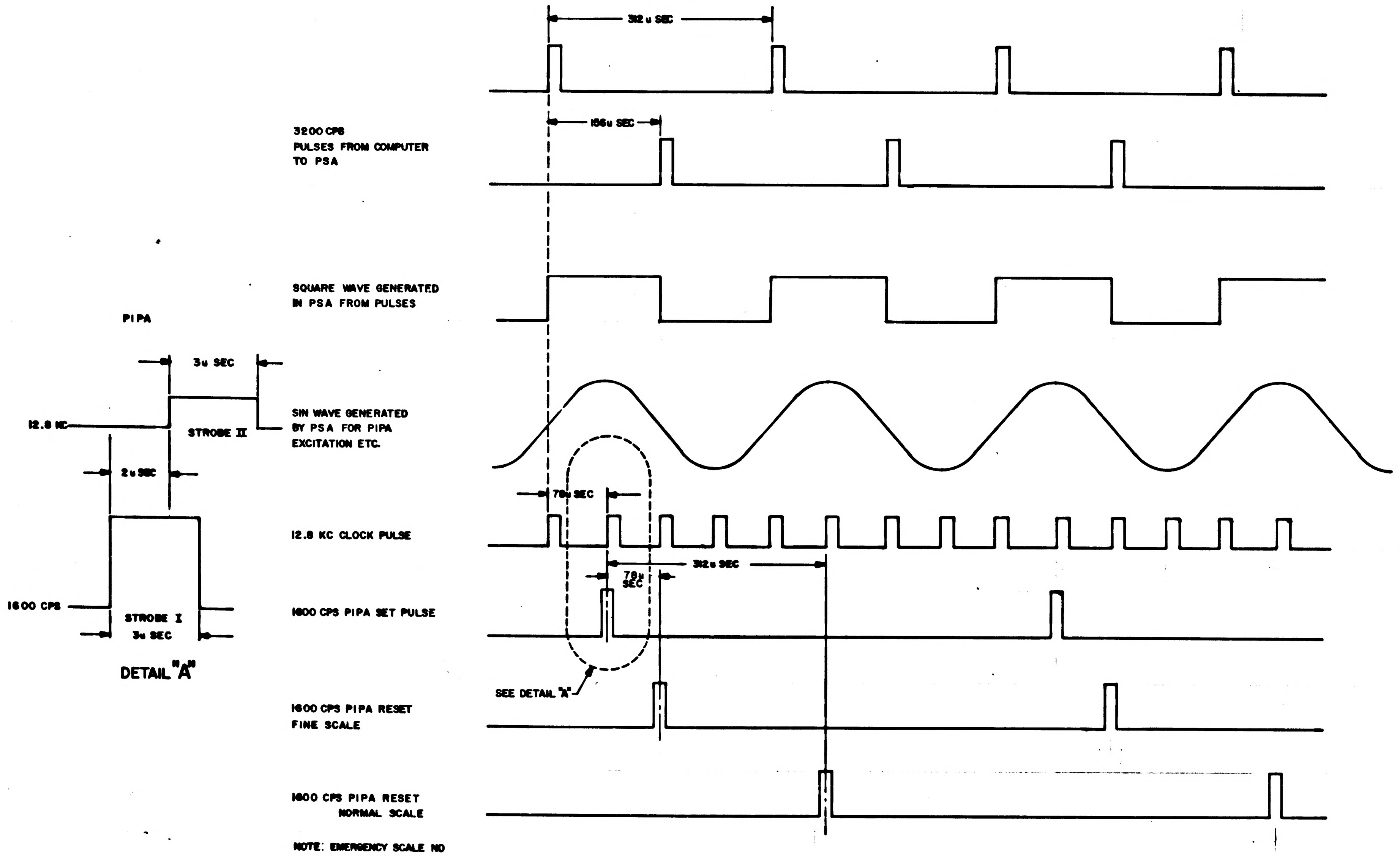
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & RELEASED CLASS A PER TDRR 00083	10 29 62	


312 u SEC
156u SEC
3200 CPS
PULSES FROM COMPUTER
TO PSA
SQUARE WAVE GENERATED
IN PSA FROM PULSES
PIPA
3u SEC
12.8 KC
STROBE II
SIN WAVE GENERATED
BY PSA FOR PIPA
EXCITATION ETC.
2 u SEC
78u SEC
12.8 KC CLOCK PULSE
312u SEC
78u SEC
1600 CPS
STROBE I
3u SEC
1600 CPS PIPA SET PULSE
DETAIL "A"
SEE DETAIL "A"
1600 CPS PIPA RESET
FINE SCALE
1600 CPS PIPA RESET
NORMAL SCALE

NOTE: EMERGENCY SCALE NO RESET PULSE

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS.
DWG. NO. CONTRACT
DRAWN BERKELEY DATE 7 18 62
CHECKED
APPROVAL Jamie Aton
APPROVAL Eldon C Hall
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PIPA
PULSE TIMING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006501
SCALE
WT
SHEET 1 OF 1

1006501 A

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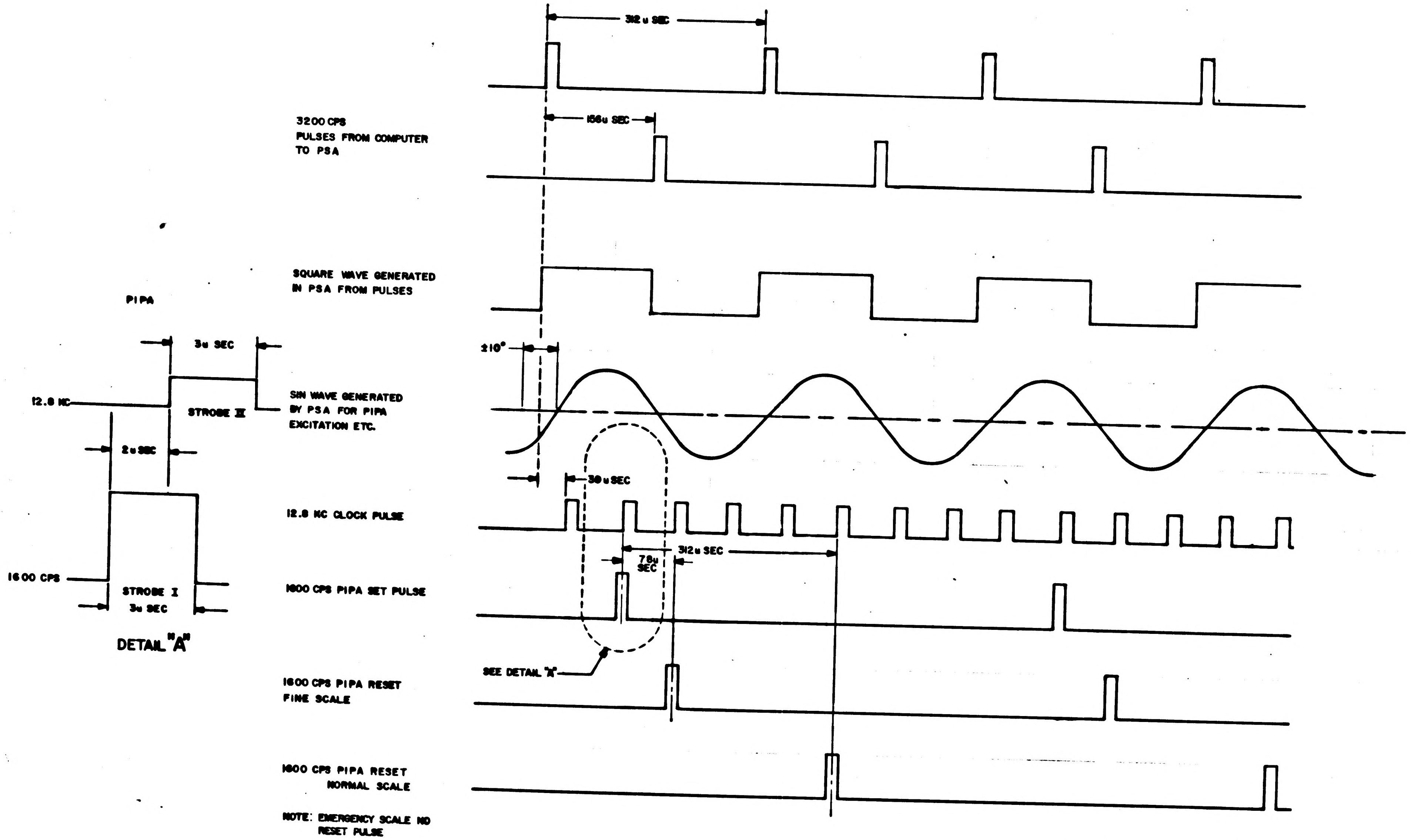
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & RELEASED CLASS A PER TDRR 00083	10-29-62	RCP WR
B	REVISED PER TDRR 00097	11-21-62	WR


312 u SEC
3200 CPS
PULSES FROM COMPUTER
TO PSA
156u SEC
SQUARE WAVE GENERATED
IN PSA FROM PULSES
±10°
SIN WAVE GENERATED
BY PSA FOR PIPA
EXCITATION ETC.
30 u SEC
12.8 KC CLOCK PULSE
312u SEC
78u SEC
1600 CPS PIPA SET PULSE
SEE DETAIL "A"
1600 CPS PIPA RESET
FINE SCALE
1600 CPS PIPA RESET
NORMAL SCALE
PIPA
3u SEC
12.8 KC
STROBE II
2u SEC
1600 CPS
STROBE I
3u SEC
DETAIL "A"

NOTE: EMERGENCY SCALE NO RESET PULSE

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG. NO. CONTRACT
DRAWN BERKELEY DATE 7 18 62
CHECKED
APPROVAL Lamar Alonso
APPROVAL Eldon C Hall
NASA APPROVAL
MIT APPROVAL

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HOUSTON, TEXAS

PIPA
PULSE TIMING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006501
SCALE
WT
SHEET 1 OF 1

1006501 B

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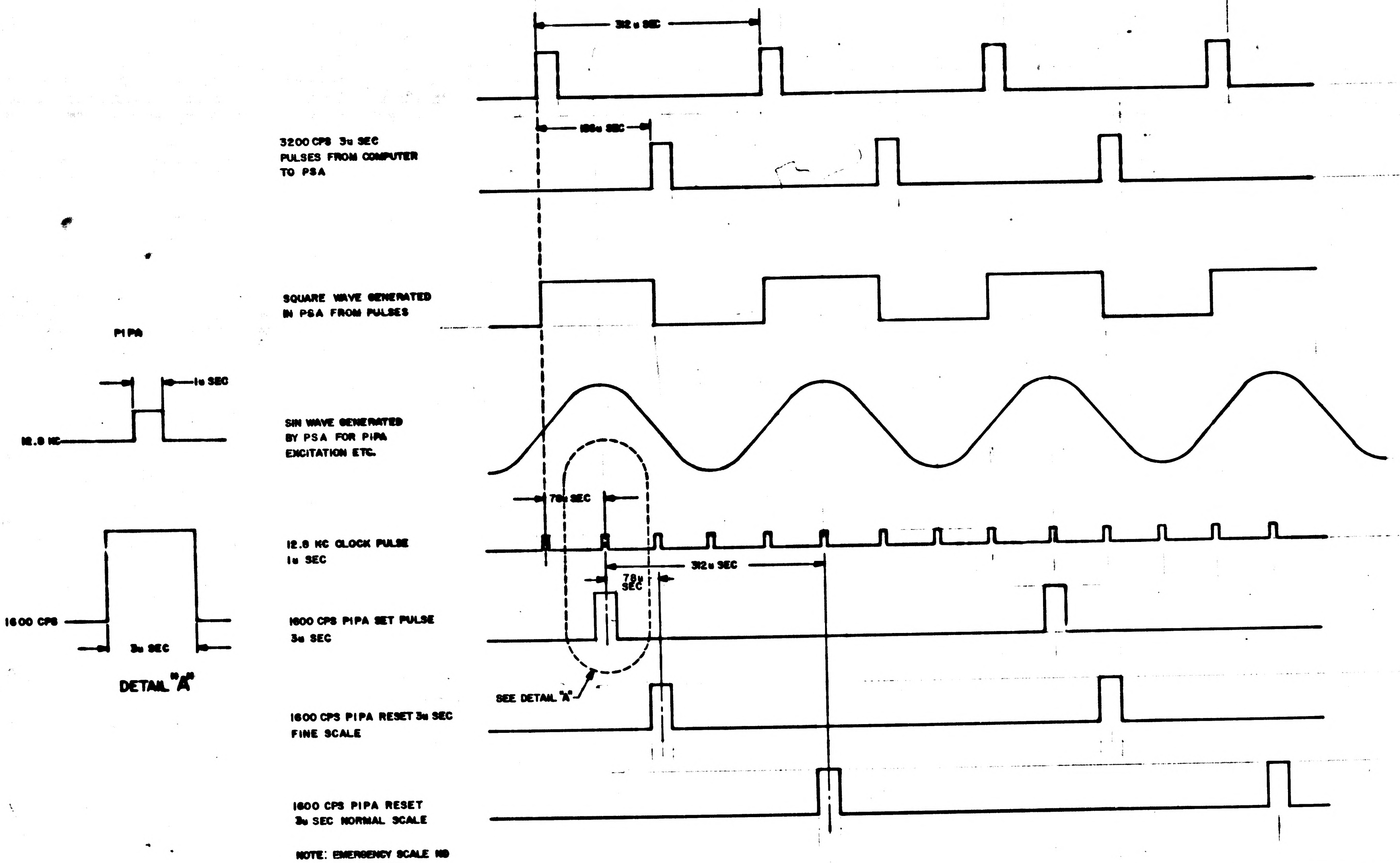
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



312 u SEC
186u SEC
3200 CPS 3u SEC PULSES FROM COMPUTER TO PSA
SQUARE WAVE GENERATED IN PSA FROM PULSES
SIN WAVE GENERATED BY PSA FOR PIPA EXCITATION ETC.
78u SEC
12.8 KC CLOCK PULSE 1u SEC
78u SEC
312u SEC
1600 CPS PIPA SET PULSE 3u SEC
SEE DETAIL "A"
1600 CPS PIPA RESET 3u SEC FINE SCALE
1600 CPS PIPA RESET 3u SEC NORMAL SCALE
PIPA
1u SEC
12.8 KC
1600 CPS
3u SEC
DETAIL "A"

NOTE: EMERGENCY SCALE NO RESET PULSE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00002 DATE 7-19-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG. NO.
CONTRACT
DRAWN BERKELEY DATE 7 19 62
CHECKED
APPROVAL Louis A Lam
APPROVAL Eldon C Hall
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PIPA
PULSE TIMING

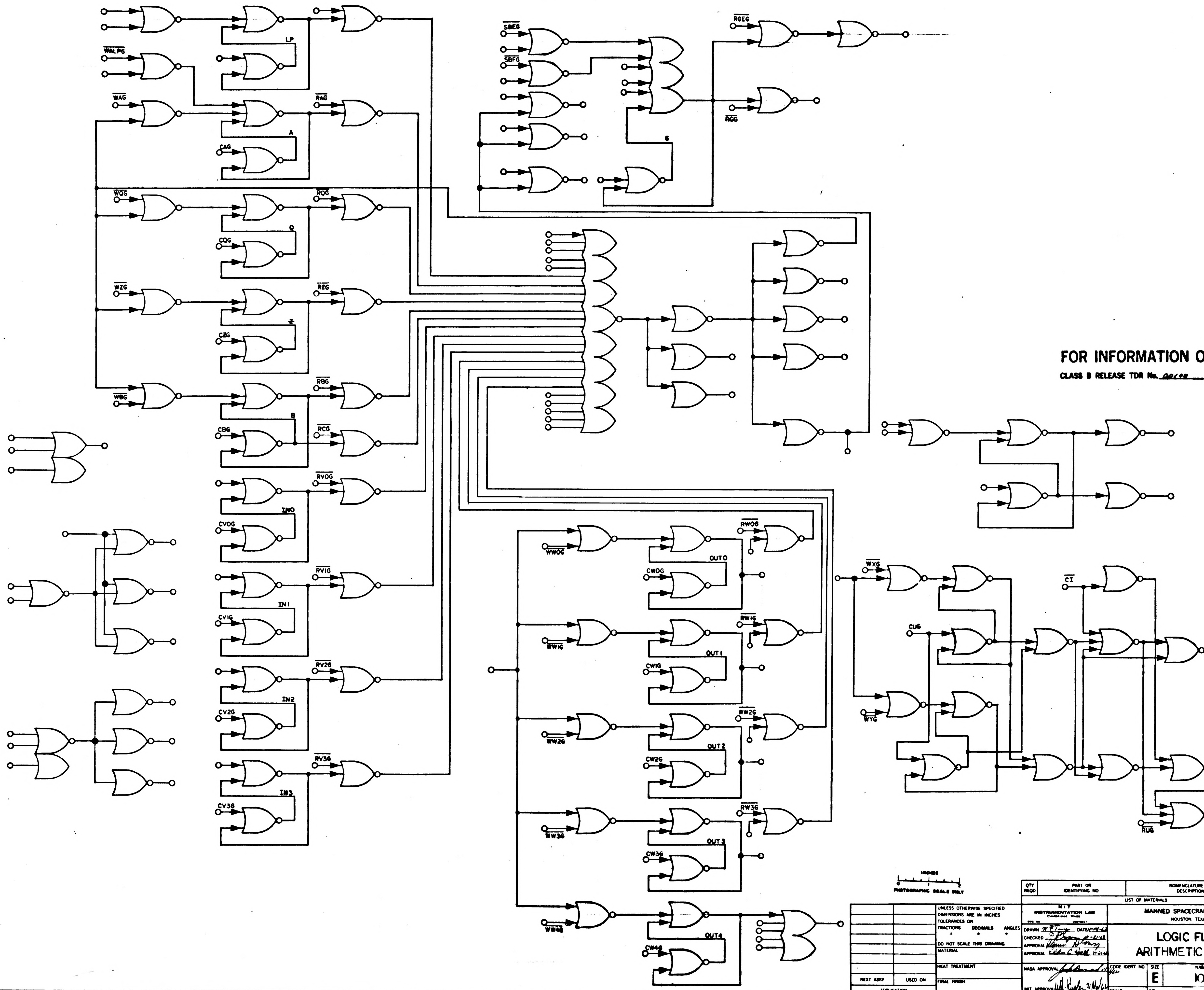
CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006501
SCALE
WT
SHEET OF

1006501

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRR 003.	12-4-62	MST



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WAG
RAG
A
CAG
WQG
RQG
Q
CQG
WZG
RZG
Z
CZG
WBG
RBG
B
CBG
RCG
RVOG
INO
CVOG
RV1G
IN1
CV1G
RV2G
IN2
CV2G
RV3G
IN3
CV3G
SBEG
SBFG
RGEG
RGG
G
RWOG
WWOG
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CWOG
RW1G
WW1G
OUT1
CW1G
RW2G
WW2G
OUT2
CW2G
RW3G
WW3G
OUT3
CW3G
WW4G
OUT4
CW4G
WXG
WYG
CI
CUG
CO
RUG

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT

DRAWN W F Tong DATE 11-14-62
CHECKED 11-21-62
APPROVAL
APPROVAL Eldon C Hall 11-21-62
NASA APPROVAL
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
ARITHMETIC STICK

CODE IDENT NO
SIZE E
NASA DRAWING NO. 1006511
SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS

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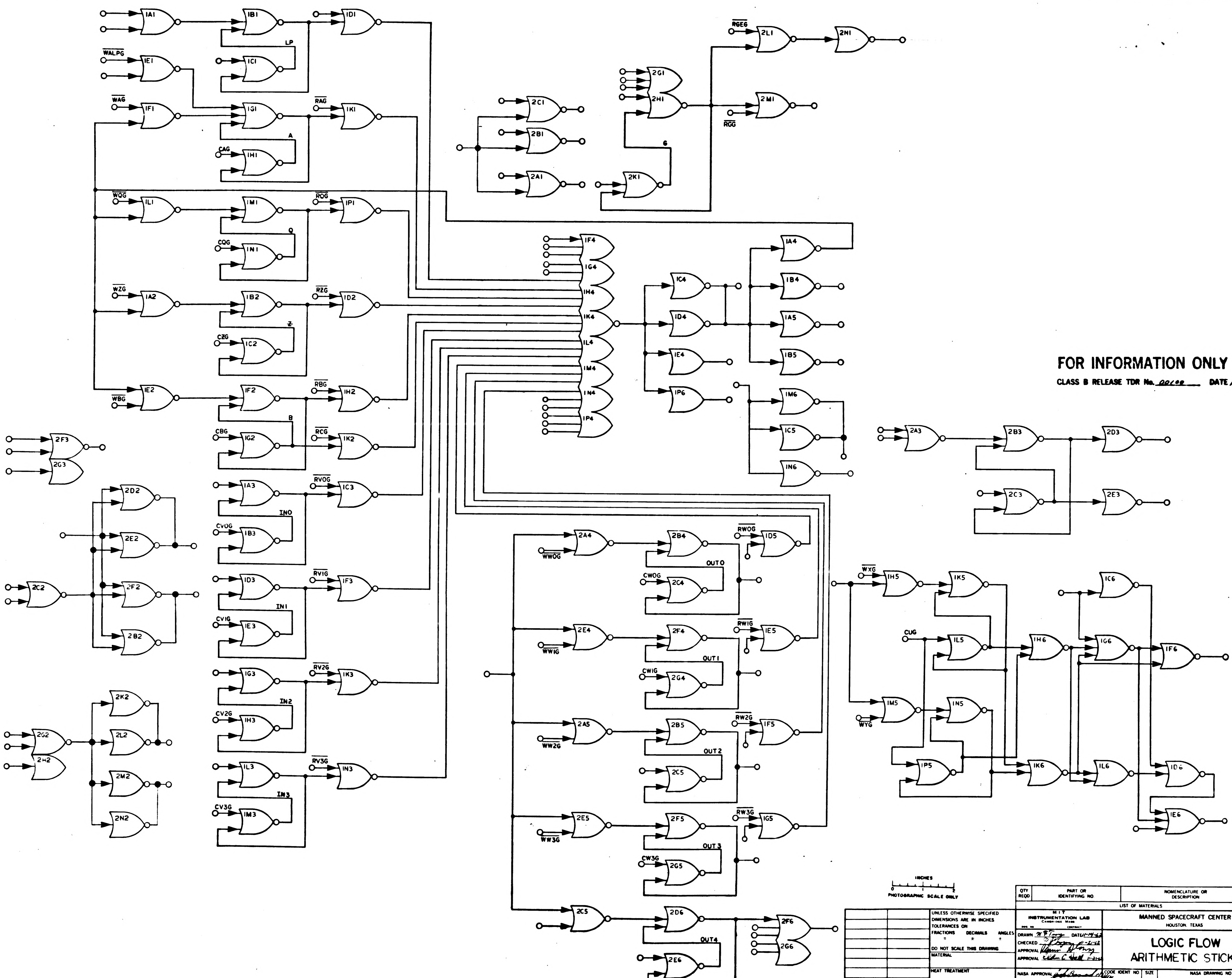
B	CHANGED PER TDRR 20491	12-20-62	BT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1C1
WALPG
1E1
WAG
1F1
1G1
RAG
1K1
A
CAG
1H1
WOG
1L1
1M1
ROG
1P1
Q
CQG
1N1
WZG
1A2
1B2
RZG
1D2
Z
CZG
1C2
1E2
WBG
1F2
RBG
1H2
B
CBG
1G2
RCG
1K2
1A3
RVOG
1C3
IN0
CV0G
1B3
1D3
RV1G
1F3
IN1
CV1G
1E3
1G3
RV2G
1K3
IN2
CV2G
1H3
1L3
RV3G
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IN3
CV3G
1M3
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2D2
2E2
2C2
2F2
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2L2
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1H4
1K4
1L4
1M4
1N4
1P4
1C4
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1A4
1B4
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2E4
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2F4
RW1G
1E5
OUT1
CW1G
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2A5
WW2G
2B5
RW2G
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OUT2
2C5
2E5
WW3G
2F5
RW3G
1G5
OUT3
CW3G
2G5
2C5
2D6
OUT4
2E6
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1K5
1C6
CUG
1L5
1H6
1G6
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1M5
WYG
1N5
1P5
1K6
1L6
1D6
1E6

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN W F Tong DATE 11-14-62
CHECKED 11-21-62
APPROVAL
APPROVAL Eldon C Hall 11-21-62
NASA APPROVAL
MIT APPROVAL 21 Nov 62

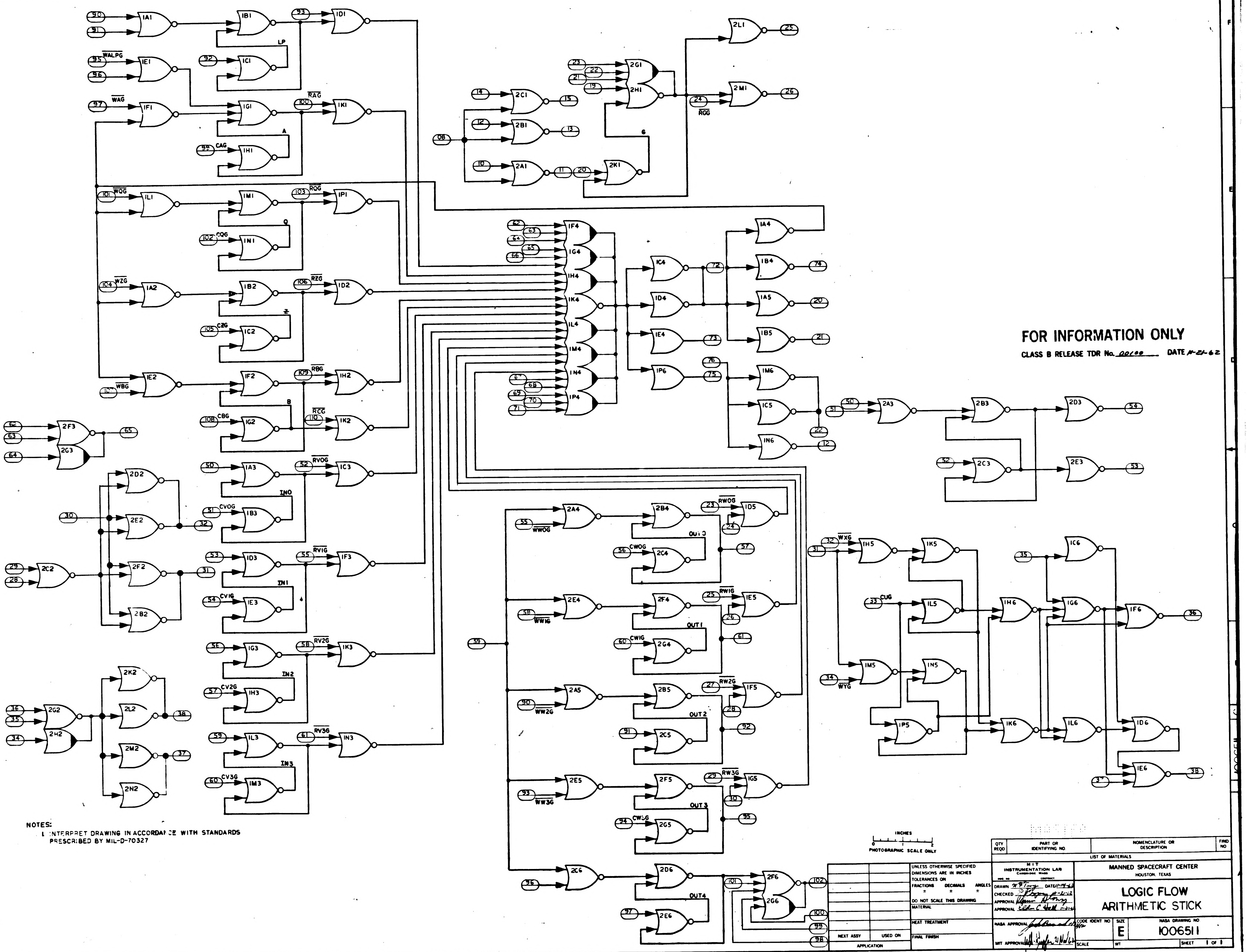
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
ARITHMETIC STICK

CODE IDENT NO
SIZE E
NASA DRAWING NO 1006511
SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRR 00131	12-4-62	MET
B	CHANGED PER TDRR 00191	12-20-62	
C	CHANGED PER TDRR C0253	1-16-63	



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RAG
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IH1
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IL1
IM1
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CQG
IN1
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WZG
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IB2
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RZG
ID2
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CZG
IC2
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WBG
IE2
IF2
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CBG
IG2
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RCG
IK2
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IA3
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IC3
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ID3
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IG3
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IG5
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CW3G
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2G6
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100
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OUT 4
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IK5
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CUG
IL5
IH6
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IM5
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IP5
IK6
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IC6
IG6
IF6
36
IL6
ID6
IE6
37
38

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN W F Tory DATE 11-14-62
CHECKED 11-21-62
APPROVAL
APPROVAL Eldon C Hall 11-21-62
NASA APPROVAL 11/21/62
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
ARITHMETIC STICK

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006511
SCALE
WT
SHEET 1 OF 1

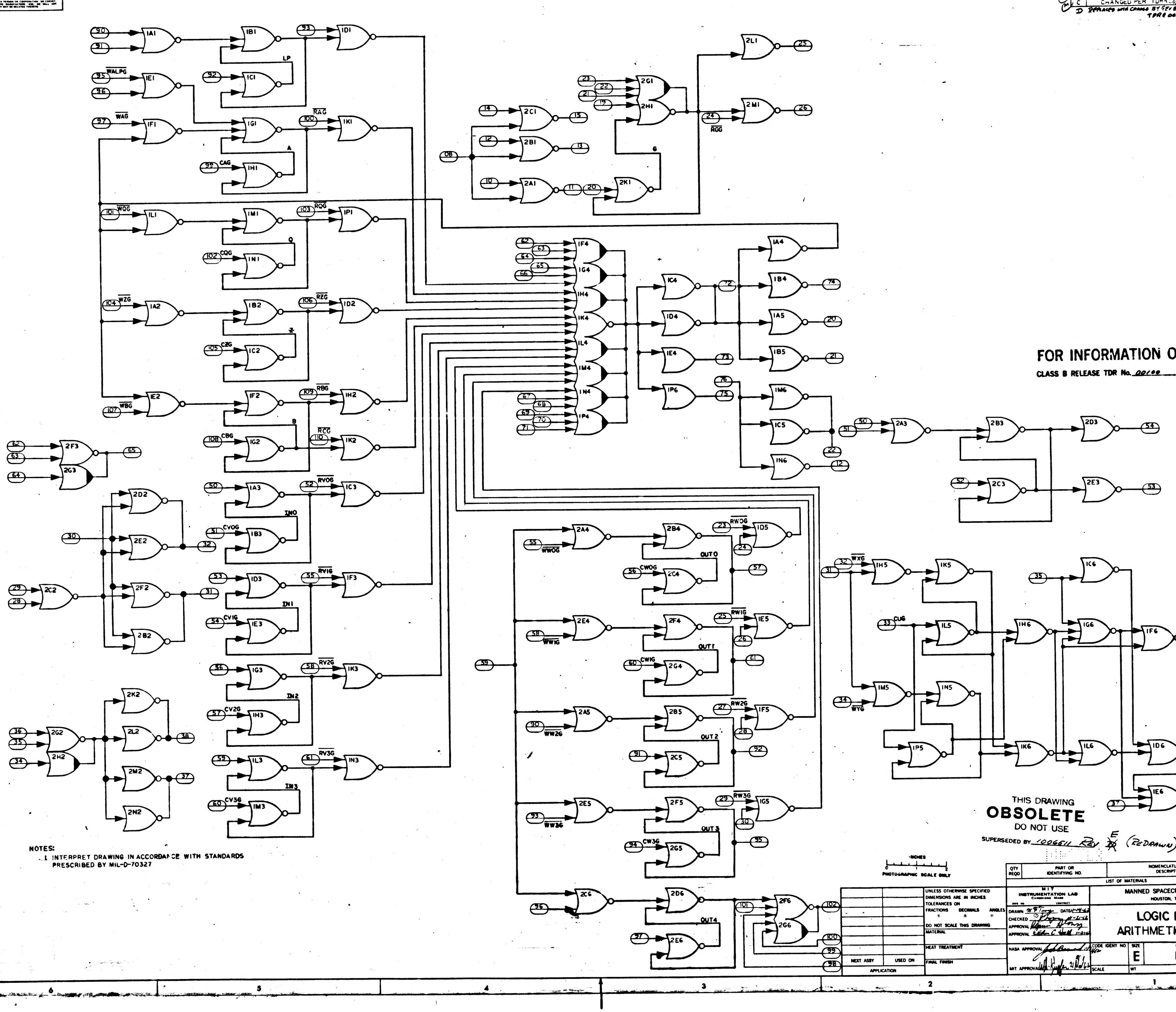
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRR 00131	12-4-62	NBT
B	CHANGED PER TDRR 00191	12-20-62	NBT
C	CHANGED PER TDRR 00253	1-16-63	

D REPLACED WITH CHANGE BY REV E TDRR 00533 = MAR 63 RCL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62



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CVOG
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CV1G
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CV2G
IN2
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CV3G
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2G2
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CWOG
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2F4
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RW1G
WW1G
CW1G
OUT1
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2C5
1F5
RW2G
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1N5
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1G6
1C6
1F6
1K6
1L6
1D6
1E6
WXG
CUG
WYG

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

THIS DRAWING
OBSOLETE
DO NOT USE
SUPERSEDED BY 1006511 REV ~~D~~ E (REDRAWN) - TDRR# 00533 RCL

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT
DRAWN W. F. Tony DATE 11-14-62
CHECKED [illegible] 11-21-62
APPROVAL [illegible]
APPROVAL Eldon C. Hall 11-21-62
NASA APPROVAL
MIT APPROVAL W. A. Kupfer 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
ARITHMETIC STICK

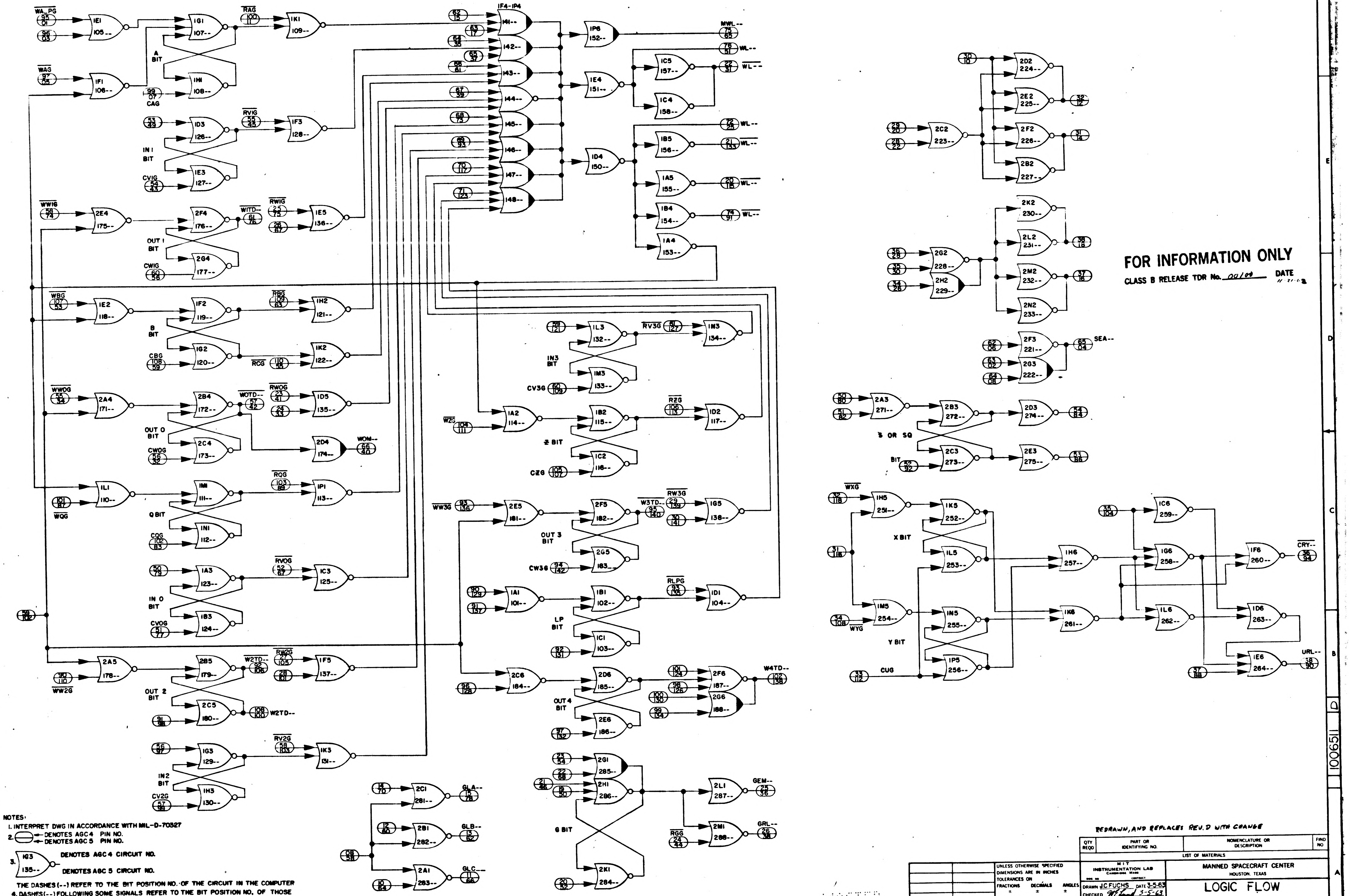
CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006511
SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REDRAWN PER TDRR 00533		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-63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1G1 107--
RAG
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WAG
1F1 106--
A BIT
1H1 108--
CAG
IF4-IP4
141-- 142-- 143-- 144-- 145-- 146-- 147-- 148--
1P6 152--
MWL--
WL--
1E4 151--
1C5 157--
1C4 158--
1D4 150--
1B5 156--
1A5 155--
1B4 154--
1A4 153--
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RVIG
1F3 128--
IN 1 BIT
CVIG
1E3 127--
WWIG
2E4 175--
2F4 176--
WITD--
RWIG
1E5 136--
OUT 1 BIT
CWIG
2G4 177--
WBG
1E2 118--
1F2 119--
RBG
1H2 121--
B BIT
1G2 120--
CBG
RCG
1K2 122--
WWOG
2A4 171--
2B4 172--
WOTD--
RWOG
1D5 135--
OUT 0 BIT
CWOG
2C4 173--
2D4 174--
WOM--
1L1 110--
1M1 111--
RQG
1P1 113--
WQG
Q BIT
1N1 112--
CQG
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1C3 125--
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CVOG
1B3 124--
2A5 178--
2B5 179--
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RW2G
1F5 137--
WW2G
OUT 2 BIT
2C5 180--
W2TD--
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RV2G
1K3 131--
IN2 BIT
CV2G
1H3 130--
1L3 132--
RV3G
1N3 134--
IN3 BIT
1M3 133--
CV3G
WZG
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1B2 115--
RZG
1D2 117--
Z BIT
1C2 116--
CZG
WW3G
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2F5 182--
W3TD--
RW3G
1G5 138--
OUT 3 BIT
2G5 183--
CW3G
1A1 101--
1B1 102--
RLPG
1D1 104--
LP BIT
1C1 103--
2C6 184--
2D6 185--
2F6 187--
W4TD--
OUT4 BIT
2E6 186--
2G6 188--
2C1 281--
GLA--
2B1 282--
GLB--
2A1 283--
GLC--
2G1 285--
2H1 286--
2L1 287--
GEM--
G BIT
2M1 288--
GRL--
RGG
2K1 284--
2D2 224--
2E2 225--
2C2 223--
2F2 226--
2B2 227--
2K2 230--
2L2 231--
2G2 228--
2M2 232--
2H2 229--
2N2 233--
2F3 221--
SEA--
2G3 222--
2A3 271--
2B3 272--
2D3 274--
S OR SQ
BIT
2C3 273--
2E3 275--
WXG
1H5 251--
1K5 252--
X BIT
1L5 253--
1H6 257--
1C6 259--
1G6 258--
1F6 260--
CRY--
1M5 254--
WYG
1N5 255--
1K6 261--
1L6 262--
1D6 263--
Y BIT
CUG
1P5 256--
1E6 264--
URL--

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH MIL-D-70327
2. DENOTES AGC 4 PIN NO.
   DENOTES AGC 5 PIN NO.
3. 1G3 DENOTES AGC 4 CIRCUIT NO.
   135-- DENOTES AGC 5 CIRCUIT NO.
   THE DASHES (--) REFER TO THE BIT POSITION NO. OF THE CIRCUIT IN THE COMPUTER
4. DASHES (--) FOLLOWING SOME SIGNALS REFER TO THE BIT POSITION NO. OF THOSE SIGNALS AS USED IN THE COMPUTER

MASTER

REDRAWN, AND REPLACES REV. D WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN J.C. FUCHS DATE 3-5-63
CHECKED W.E. Land 3-5-63
APPROVAL
APPROVAL Eldon C. Hall 3/6/63
NASA APPROVAL
MIT APPROVAL 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

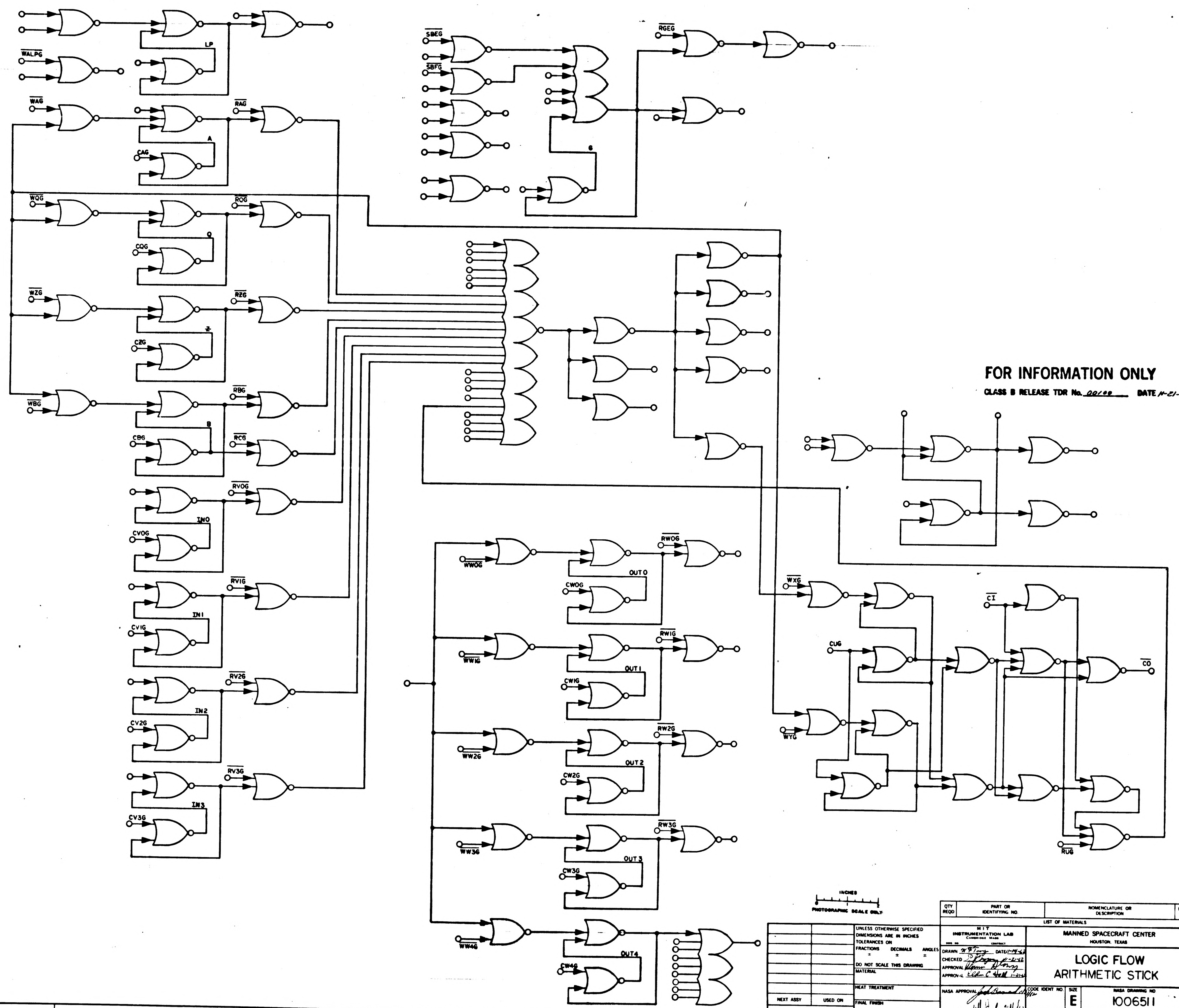
LOGIC FLOW
ARITHMETIC STICK

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006511
SCALE WT SHEET 1 OF 1

1006511 D

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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RQG
Q
CQG
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RZG
Z
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RBG
B
CBG
RCG
RVOG
IN0
CVOG
RV1G
IN1
CV1G
RV2G
IN2
CV2G
RV3G
IN3
CV3G
SBEG
SBFG
RGEG
G
WWOG
RWOG
OUT0
CWOG
WW1G
RW1G
OUT1
CW1G
WW2G
RW2G
OUT2
CW2G
WW3G
RW3G
OUT3
CW3G
WW4G
OUT4
CW4G
WXG
WYG
CI
CUG
CO
RUG

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CLASS B RELEASE TDR No. 00100 DATE 11-21-62

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN W F Tang DATE 11-14-62
CHECKED [illegible] 11-21-62
APPROVAL [illegible]
APPROVAL Eldon C Hall 11-21-62
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
ARITHMETIC STICK

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006511
SCALE
WT
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
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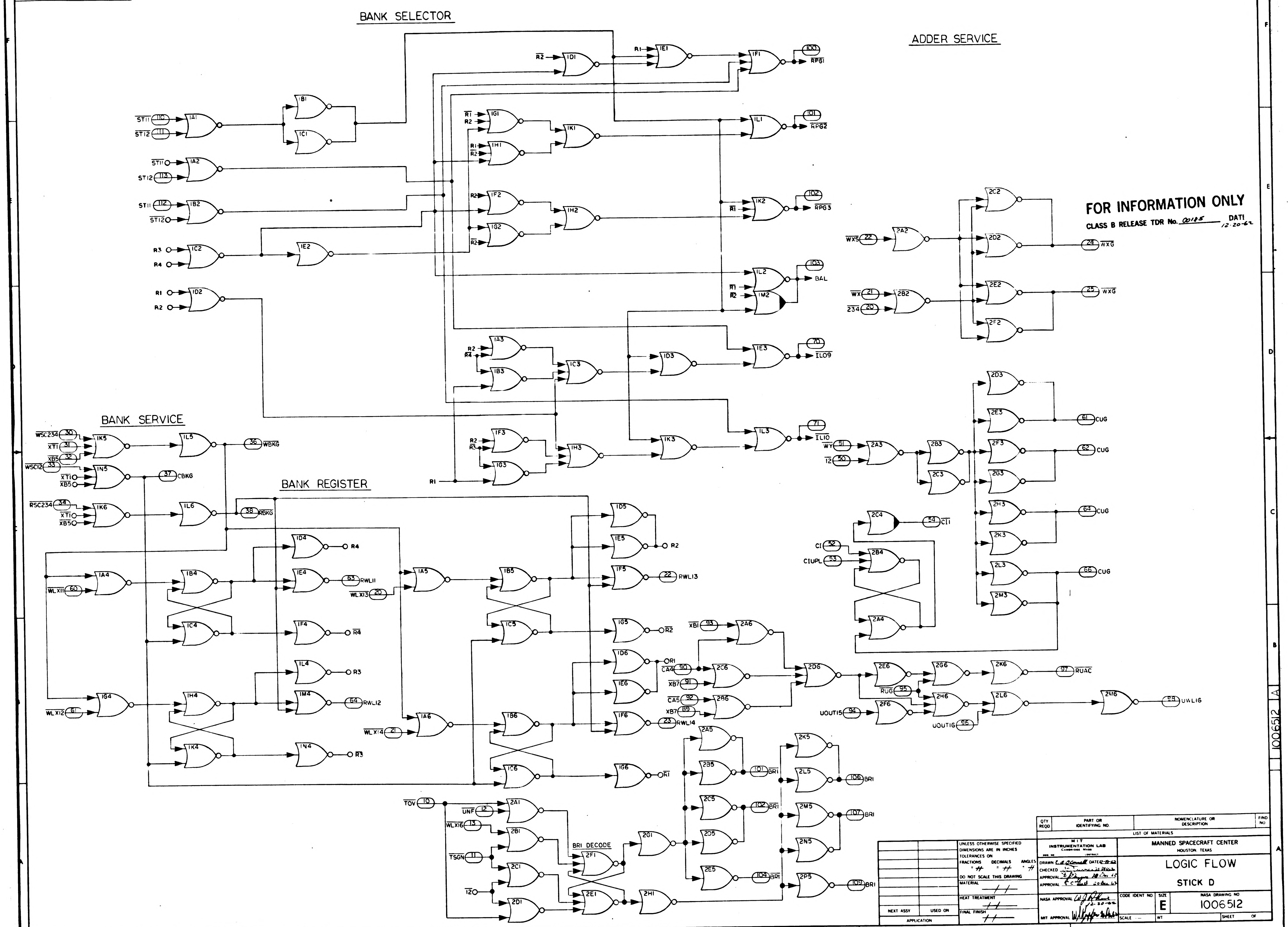
CLASS B RELEASE TDR No. 00185 DATE 12-20-62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F
E
D
C
B
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ADDER SERVICE
BANK SERVICE
BANK REGISTER
BRI DECODE
ST11 110
ST12 111
ST11
ST12 113
ST11 112
ST12
R3
R4
R1
R2
1A1
1B1
1C1
1A2
1B2
1C2
1D2
1E2
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1H2
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1L2
1M2
1A3
1B3
1C3
1D3
1E3
1F3
1G3
1H3
1K3
1L3
100 RPG1
101 RPG2
102 RPG3
103 BAL
70 ILO9
71 ILI0
WX5 22
WX 21
234 20
2A2
2B2
2C2
2D2
2E2
2F2
24 WXG
25 WXG
WY 51
12 50
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2C3
2D3
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61 CUG
62 CUG
64 CUG
66 CUG
2C4
59 CI
CI 52
CIUPL 53
2B4
2A4
WSC234 30
XT1 31
XB5 32
WSC12 33
XT1
XB5
RSC234 34
1K5
1N5
1K6
1L5
1L6
36 WBKG
37 CBKG
38 RBKG
1A4
WLX11 60
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1C4
1D4
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1M4
1N4
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1H4
1K4
WLX12 61
R4
63 RWL11
R4
R3
64 RWL12
R3
1A5
WLX13 20
1B5
1C5
1D5
1E5
1F5
1G5
R2
22 RWL13
R2
1A6
WLX14 21
1B6
1C6
1D6
1E6
1F6
1G6
R1
23 RWL14
R1
XB1 93
CA4 90
XB7 91
CA5 92
XB7 89
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2C6
2B6
2D6
2E6
2F6
2G6
2H6
2K6
2L6
2M6
RUG 95
UOUT15 94
UOUT16 96
97 RUAC
98 UWL16
TOV 10
UNF 12
WLX16 13
TSGN 11
12
2A1
2B1
2C1
2D1
2E1
2F1
2G1
2H1
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2B5
2C5
2D5
2E5
2K5
2L5
2M5
2N5
2P5
101 BR1
102 BR1
104 BR1
106 BR1
107 BR1
109 BR1
1006512 A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DIMENSIONS ARE IN INCHES
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MATERIAL //
HEAT TREATMENT //
FINAL FINISH //

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INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT

DRAWN E A O'Connell DATE 12-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW

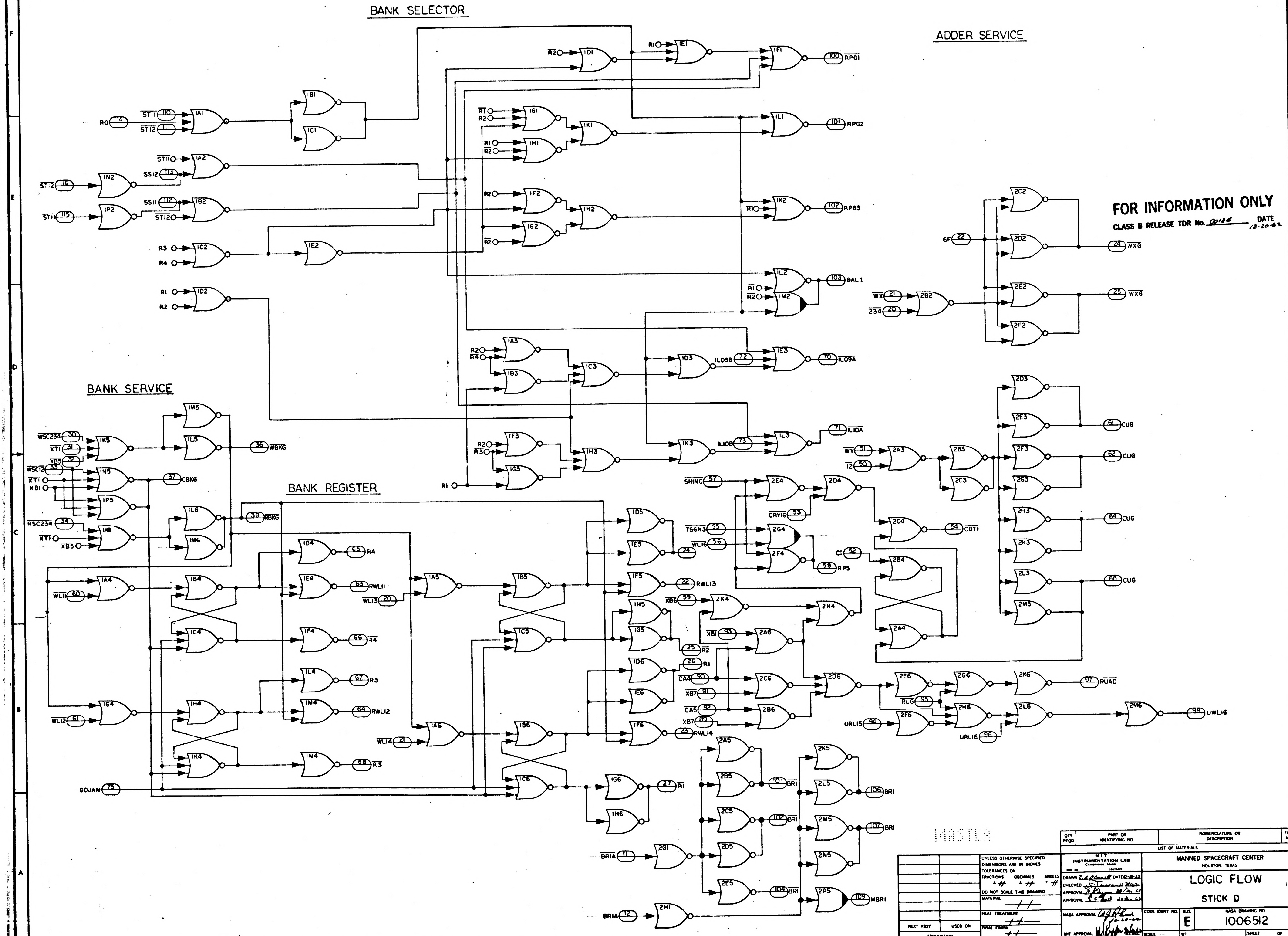
STICK D

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006512
SCALE —
WT
SHEET OF

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
A	CHANGED PER TDRR 00258	1-21-63	CCA	WK
B	CHANGED PER TDRR 00524	2-2-63	CCH	WK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ADDER SERVICE
BANK SERVICE
BANK REGISTER
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1B1
1C1
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1B2
1N2
1P2
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2K5
2L5
2M5
2N5
2P5
2G1
2H1
R0
STI1
STI2
SSI2
SSI1
R1
R2
R3
R4
RPG1
RPG2
RPG3
BAL 1
IL09B
IL09A
IL10B
IL10A
WSC234
XT1
XB5
WSC12
XB1
RSC234
XB3
WBKG
CBKG
RBKG
WL11
WL12
WL13
WL14
GOJAM
RWL11
RWL12
RWL13
RWL14
XB6
XB7
CA4
CA5
BR1
MBR1
BR1A
6F
WXG
WX
234
WY
12
CUG
SHINC
CRY16
TSGN3
WL16
C1
RP5
CBT1
RUG
RUAC
URL15
URL16
UWL16

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00125 DATE 12-20-62

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
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FRACTIONS ± — DECIMALS ± — ANGLES ± —
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MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT

DRAWN E A O'Connell DATE 12-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK D

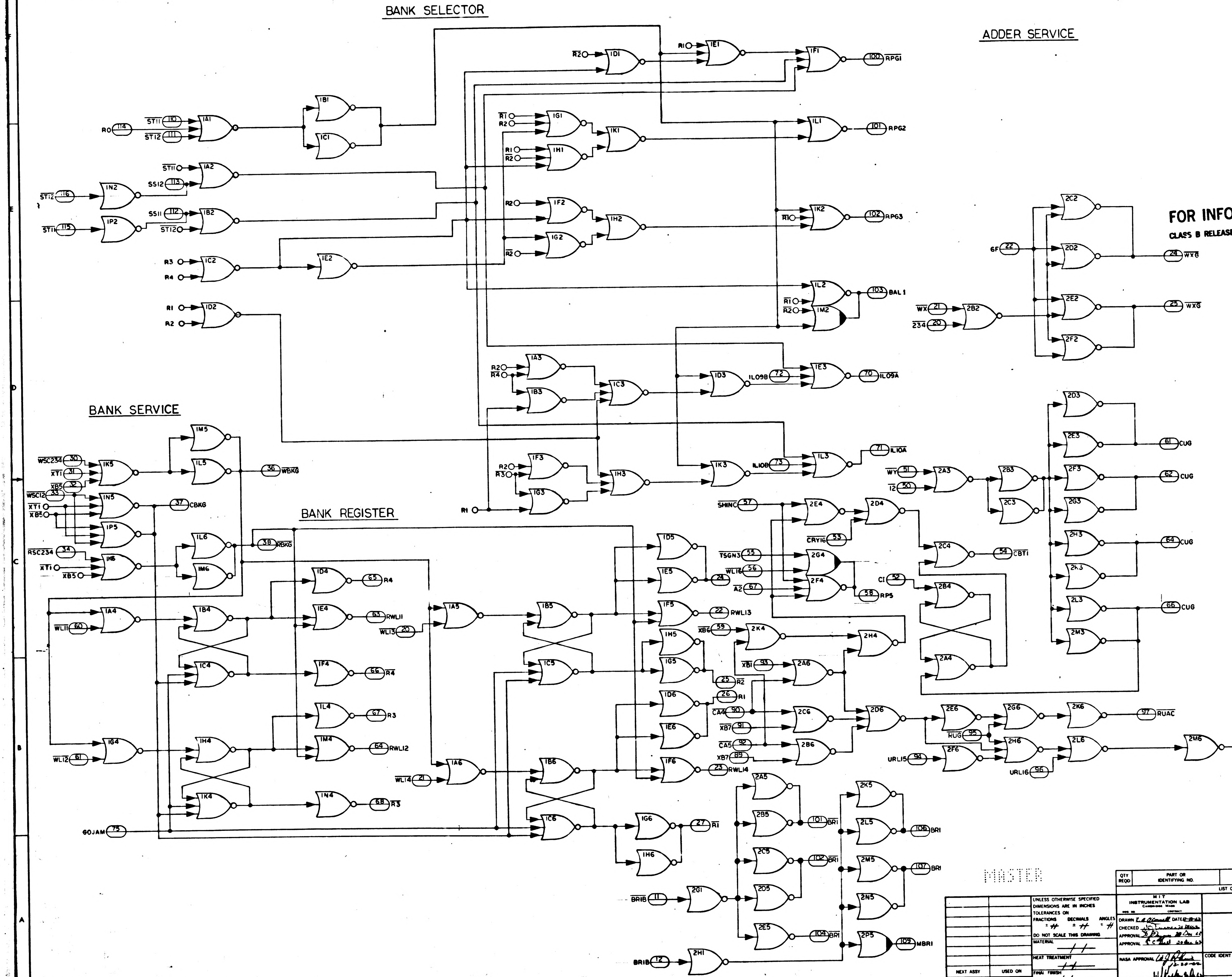
CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006512
SCALE —
WT
SHEET OF

1006512 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
A	CHANGED PER TDRR 0028	1-21-63	ECH	WK
B	CHANGED PER TDRR 00524	2-2-63	ECH	WK
C	CHANGED PER TDRR 00913	4-5-63	ECH	LL



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ADDER SERVICE
BANK SERVICE
BANK REGISTER
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ST11 110
ST12 111
ST12 116
ST11 115
SS12 113
SS11 112
R3
R4
R1
R2
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1B1
1C1
1A2
1B2
1N2
1P2
1C2
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1D2
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1E1
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1K3
1L3
100 RPG1
101 RPG2
102 RPG3
103 BAL 1
IL09B 72
70 IL09A
IL10B 73
71 IL10A
WSC234 30
XT1 31
XB5 32
WSC12 33
XT1
XB5
RSC234 34
XT1
XB5
1K5
1M5
1L5
1N5
1P5
1L6
1M6
1K6
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37 CBKG
38 RBKG
WL11 60
WL12 61
60JAM 75
WL13 20
WL14 21
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1B4
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1G4
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1E4
1F4
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1A5
1B5
1C5
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1B6
1C6
65 R4
63 RWL11
66 R4
67 R3
64 RWL12
68 R3
1D5
1E5
1F5
1H5
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1F6
1G6
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24
22 RWL13
25 R2
26 R1
23 RWL14
27 R1
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2D2
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2F2
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2L3
2M3
61 CUG
62 CUG
64 CUG
66 CUG
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12 50
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2B3
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SHINC 57
CRY16 53
TSGN3 55
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2A4
54 CBT1
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2D6
2E6
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2H6
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2M6
RUG 95
URL15 94
URL16 96
97 RUAC
98 UWL16
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2E5
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2L5
2M5
2N5
2P5
BR1B 11
BR1B 12
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101 BR1
102 BR1
104 BR1
106 BR1
107 BR1
109 MBR1

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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MATERIAL //
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FINAL FINISH //

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CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN E A O'Connell DATE 12-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK D

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006512
SCALE —
WT
SHEET OF

1006512 C

INCHES
PHOTOGRAPHIC SCALE ONLY

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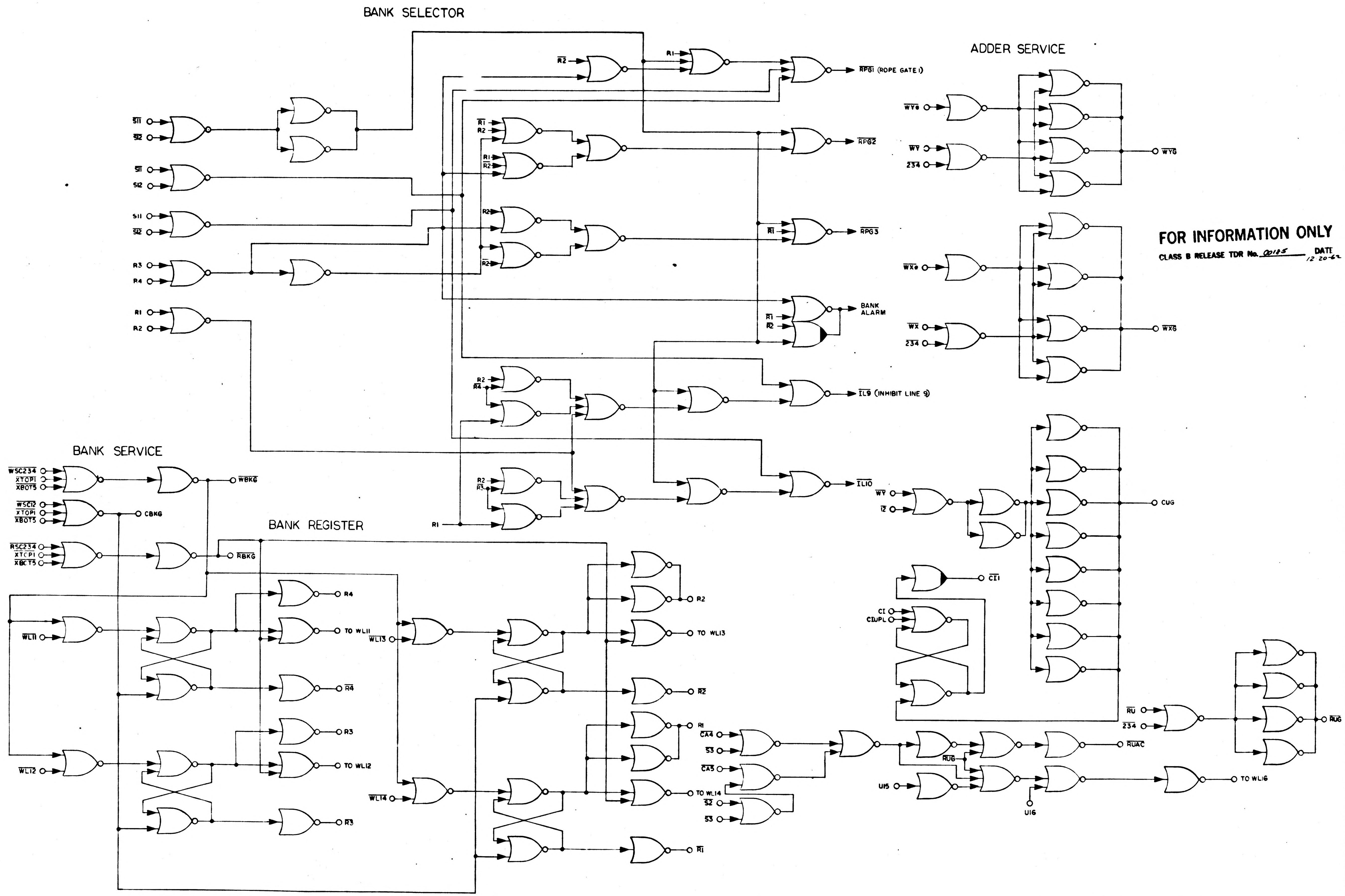
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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$\overline{S11}$
S12
S11
$\overline{S12}$
R3
R4
R1
R2
$\overline{R2}$
R1
$\overline{RPG1}$ (ROPE GATE 1)
$\overline{R1}$
R2
R1
$\overline{R2}$
$\overline{RPG2}$
R2
$\overline{R2}$
$\overline{R1}$
$\overline{RPG3}$
$\overline{R1}$
$\overline{R2}$
BANK ALARM
R2
$\overline{R4}$
$\overline{IL9}$ (INHIBIT LINE 9)
R2
$\overline{R3}$
R1
$\overline{IL10}$
ADDER SERVICE
$\overline{WY\#}$
$\overline{WY}$
$\overline{234}$
$\overline{WYG}$
$\overline{WX\#}$
$\overline{WX}$
$\overline{234}$
$\overline{WXG}$
$\overline{WY}$
$\overline{I2}$
CUG
$\overline{CI1}$
CI
CIUPL
$\overline{RU}$
$\overline{234}$
$\overline{RUG}$
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$\overline{WSC234}$
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$\overline{XBOT5}$
$\overline{WBKG}$
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$\overline{RBKG}$
BANK REGISTER
$\overline{WL11}$
R4
TO WL11
$\overline{R4}$
$\overline{WL12}$
R3
TO WL12
$\overline{R3}$
$\overline{WL13}$
R2
TO WL13
$\overline{R2}$
$\overline{WL14}$
R1
TO WL14
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$\overline{CA4}$
$\overline{S3}$
$\overline{CA5}$
$\overline{S2}$
S3
$\overline{RUAC}$
$\overline{RUG}$
U15
U16
TO WL16

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1006512

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY | USED ON
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DIMENSIONS ARE IN INCHES
TOLERANCES ON
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DWG NO CONTRACT
DRAWN E. A. O'Connell DATE 12-18-62
CHECKED [illegible] 20 Dec 62
APPROVAL [illegible] 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL [illegible] 12-20-62
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK D

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006512
SCALE —
WT
SHEET OF

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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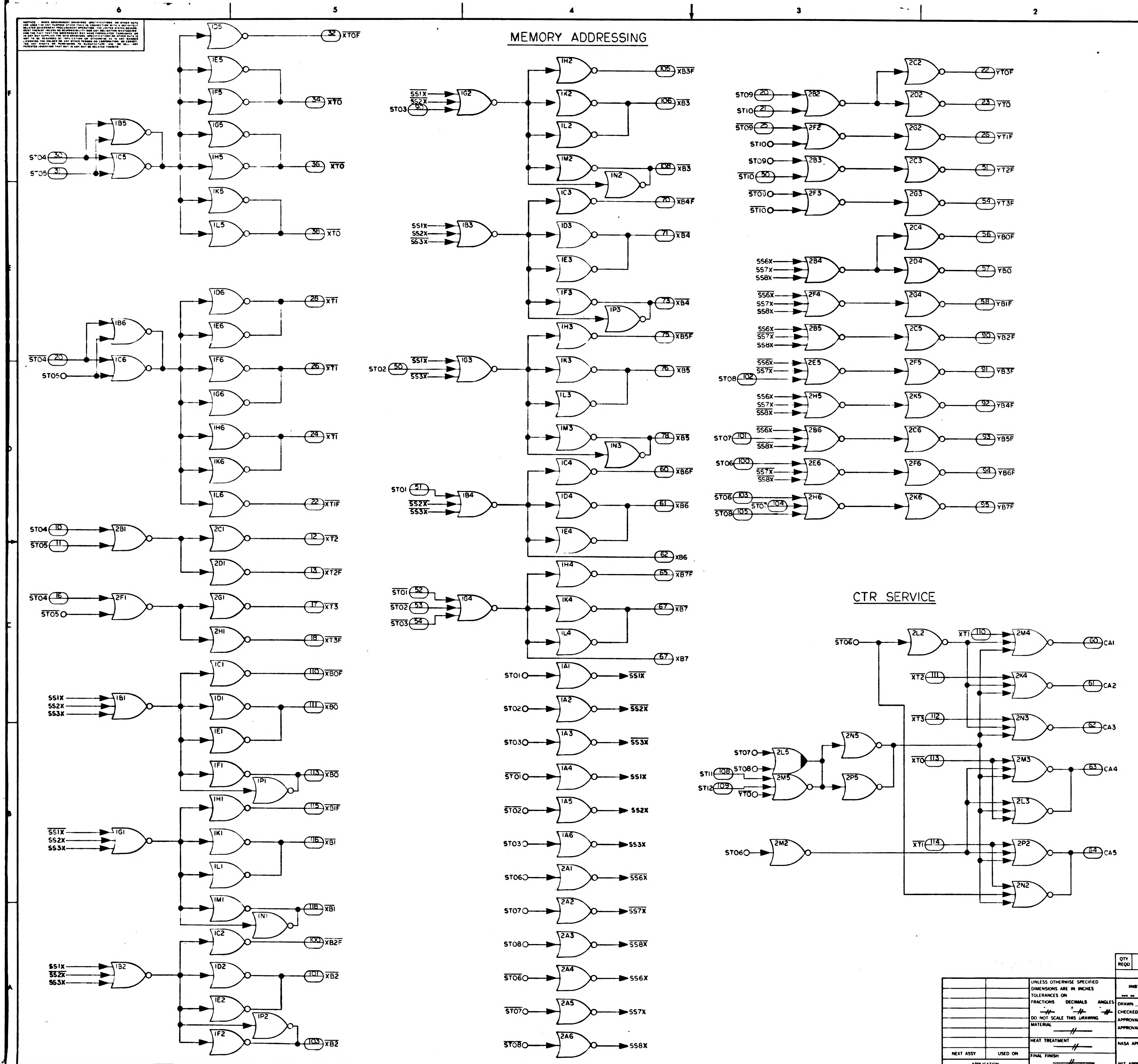

MEMORY ADDRESSING
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1K5
1L5
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34 XT0
36 XT0
38 XT0
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ST05
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1C6
1D6
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1H6
1K6
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24 XT1
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ST05
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106 XB3
108 XB3
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1C3
1D3
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1F3
1P3
70 XB4F
71 XB4
73 XB4
ST02 50
SS1X
SS3X
1G3
1H3
1K3
1L3
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1K4
1L4
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67 XB7
67 XB7
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ST02
ST03
ST01
ST02
ST03
ST06
ST07
ST08
ST06
ST07
ST08
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1A6
2A1
2A2
2A3
2A4
2A5
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SS2X
SS3X
SS1X
SS2X
SS3X
SS6X
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SS8X
SS6X
SS7X
SS8X
ST09 20
ST10 21
ST09 25
ST10
ST09
ST10 50
ST03
ST10
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2F2
2B3
2F3
2C2
2D2
2G2
2C3
2G3
22 YT0F
23 YT0
25 YT1F
51 YT2F
54 YT3F
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SS7X
SS8X
2B4
2F4
2B5
2E5
2H5
2B6
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2H6
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ST08 105
ST07 104
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2D4
2G4
2C5
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2K5
2C6
2F6
2K6
56 YB0F
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91 YB3F
92 YB4F
93 YB5F
94 YB6F
95 YB7F
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XT2 111
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XT1 114
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2K4
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2L3
2P2
2N2
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63 CA4
64 CA5
ST07
ST08
ST11 108
ST12 109
YT0
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2M5
2N5
2P5
ST06
2M2

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CLASS B RELEASE TDR No. 00175 DATE 12-20-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

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INSTRUMENTATION LAB
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CHECKED 20 DEC 62
APPROVAL
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "A"

CODE IDENT NO | SIZE E | NASA DRAWING NO 1006513
SCALE NONE | WT | SHEET 1 OF 1

1006513 A

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REVISIONS				
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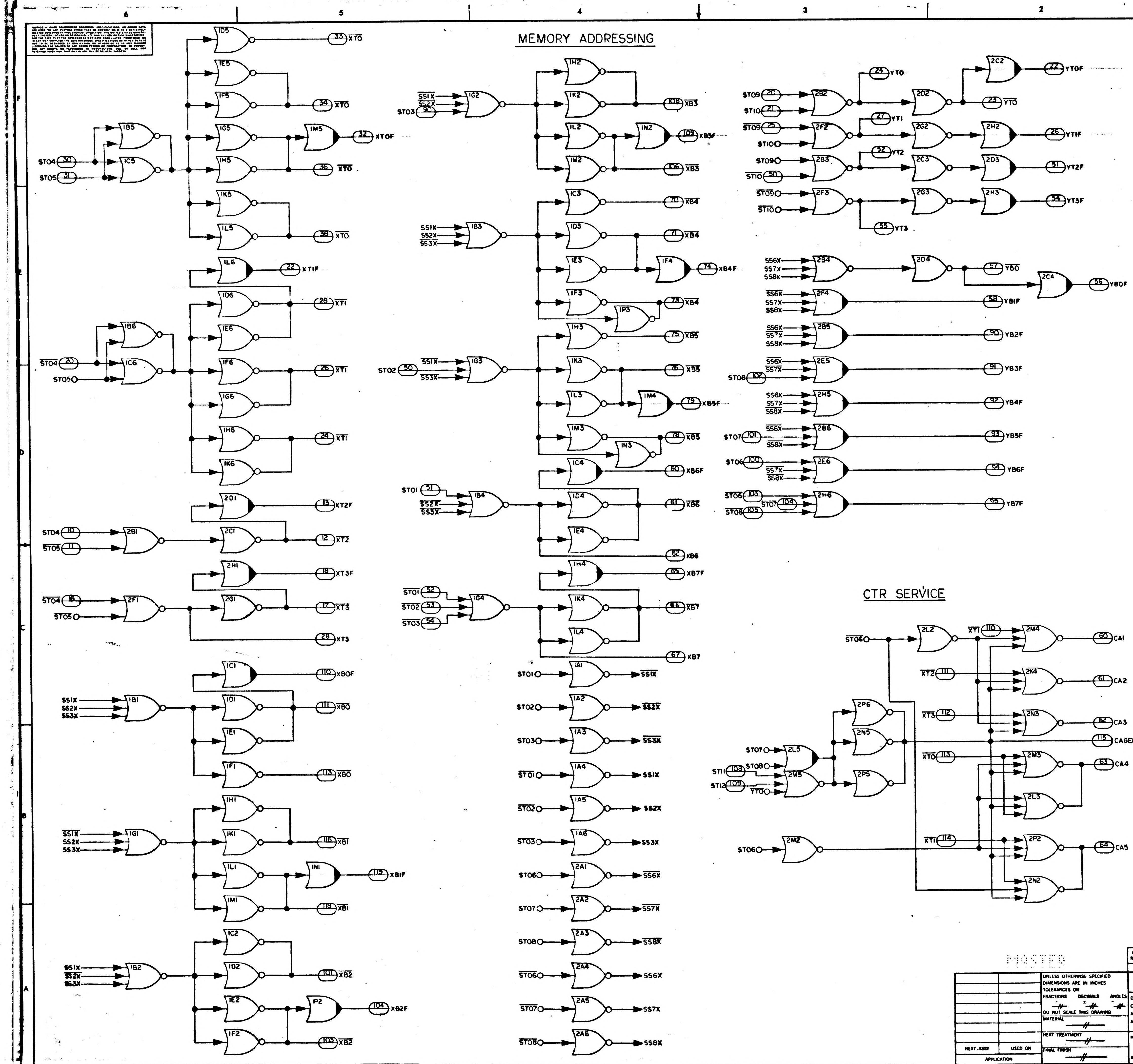
B	CHANGED PER TDRR 00516	3-6-63	ECA	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STO5 31
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34 XTO
32 XTOF
36 XTO
38 XTO
1L6 22 XT1F
1D6 1E6 1F6 1G6 1H6 1K6 1B6 1C6
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STO5
28 XT1
26 XT1
24 XT1
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2H1 2G1 2F1 18 XT3F 17 XT3 28 XT3
STO4 16 STO5
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STO2 1A2 SS2X
STO3 1A3 SS3X
STO1 1A4 SS1X
STO2 1A5 SS2X
STO3 1A6 SS3X
STO6 2A1 SS6X
STO7 2A2 SS7X
STO8 2A3 SS8X
STO6 2A4 SS6X
STO7 2A5 SS7X
STO8 2A6 SS8X
STO9 20 STO10 21 2B2 24 YTO 2D2 2C2 22 YTOF 23 YTO
STO9 25 STO10 2F2 27 YT1 2G2 2H2 26 YT1F
STO9 STO10 30 2B3 52 YT2 2C3 2D3 51 YT2F
STO9 STO10 2F3 2G3 2H3 53 YT3 54 YT3F
SS6X SS7X SS8X 2B4 2D4 57 YBO 2C4 56 YBOF
2F4 58 YB1F
2B5 90 YB2F
STO8 102 2E5 91 YB3F
2H5 92 YB4F
STO7 101 2B6 93 YB5F
STO6 100 2E6 94 YB6F
STO6 103 STO7 104 STO8 105 2H6 95 YB7F
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XT2 111 2K4 61 CA2
XT3 112 2N3 62 CA3
115 CAGEN
STO7 STO8 2L5 2M5 2P6 2N5 2P5
ST11 108 ST12 109 YTO
XTO 113 2M3 63 CA4
2L3
STO6 2M2 XT1 114 2P2 64 CA5
2N2
1006513 A

FOR INFORMATI[illegible] Y
CLASS B RELEASE TDR No.
DATE 12-20-62

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
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CHECKED W. Tarrants 20 Dec 62
APPROVAL E. Duggan 20 Dec 62
APPROVAL E. O'Neill 20 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL W. Hopp 20 Dec 62

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LOGIC FLOW
STICK "A"

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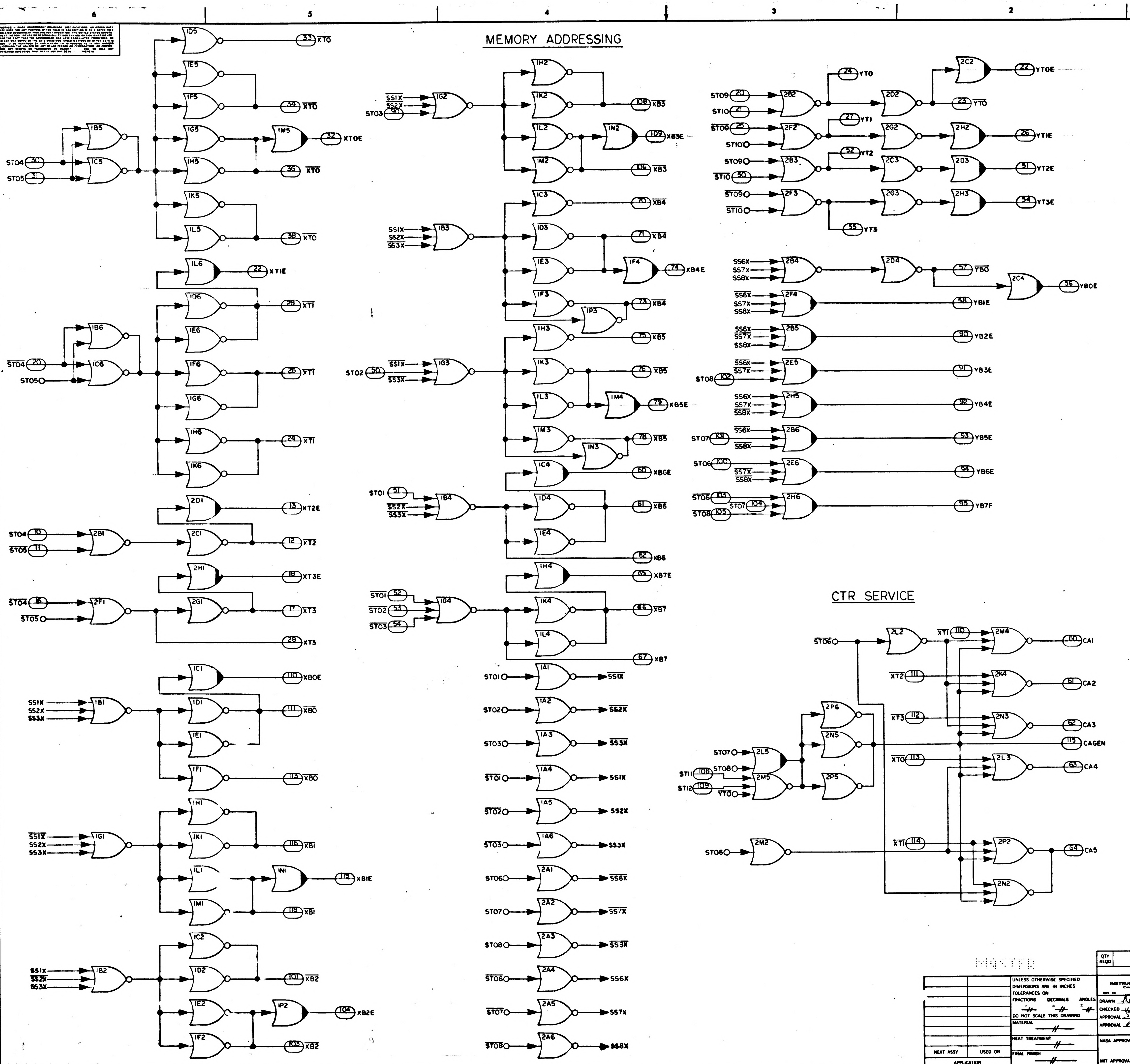
REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	CHANGED PER TDRR 0029	1-21-63	ECA	WR
B	CHANGED PER TDRR 00516	3-6-63	ECA	WK
C	CHANGED PER TDRR 00912	4-15-63	ECA	WK



MEMORY ADDRESSING
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XT1
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XT3E
XT3
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XB0
XB1
XB1E
XB2
XB2E
SS1X
SS2X
SS3X
ST01
ST02
ST03
XB3
XB3E
XB4
XB4E
XB5
XB5E
XB6E
XB6
XB7E
XB7
SS6X
SS7X
SS8X
ST06
ST07
ST08
ST09
ST10
YT0
YT0E
YT1
YT1E
YT2
YT2E
YT3
YT3E
YB0
YB0E
YB1E
YB2E
YB3E
YB4E
YB5E
YB6E
YB7F
ST11
ST12
CA1
CA2
CA3
CAGEN
CA4
CA5

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1006513 C

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
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APPROVAL
NASA APPROVAL 12-20-62
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HOUSTON, TEXAS

LOGIC FLOW
STICK "A"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006513
SCALE NONE
WT
SHEET 1 OF 1

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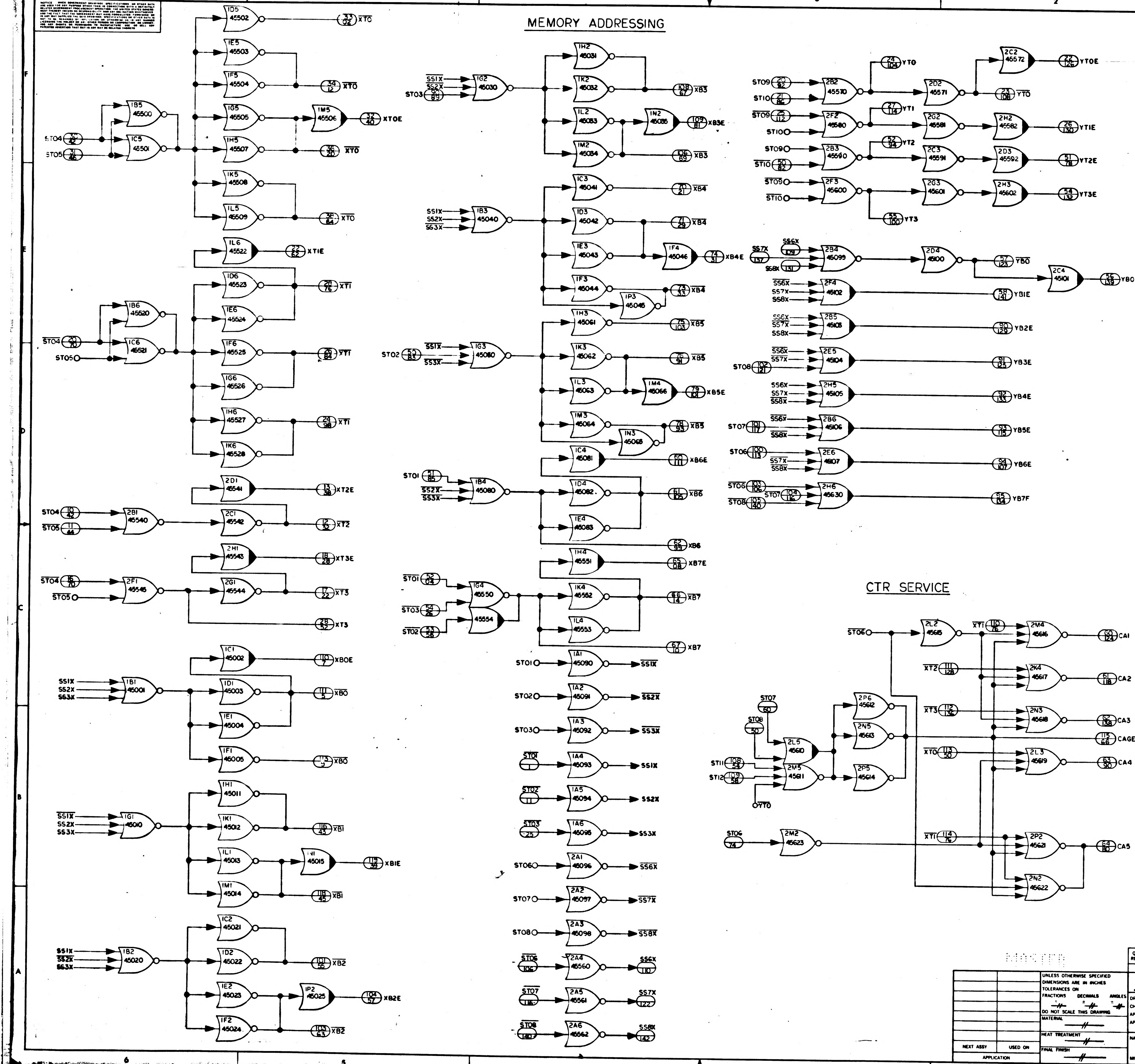
REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	CHANGED PER TDRR 0029	2-21-63	ECM	WR
B	CHANGED PER TDRR 00516	3-6-63	ECM	WR
C	CHANGED PER TDRR 00912	4-15-63	ECM	WR
D	CHANGED PER TDRR 01167	5-8-63	ECM	WR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CTR SERVICE
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XT1E
XT1
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XT2
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SS7X
SS8X
ST01
ST02
ST03
ST04
ST05
ST06
ST07
ST08
ST09
ST10
ST11
ST12
YT0
YT0E
YT1
YT1E
YT2
YT2E
YT3
YT3E
YB0
YB0E
YB1E
YB2E
YB3E
YB4E
YB5E
YB6E
YB7F
CA1
CA2
CA3
CAGEN
CA4
CA5

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Cambridge Mass
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DRAWN [illegible] DATE 12-19-62
CHECKED [illegible] 20 Dec 62
APPROVAL [illegible] 20 Dec 62
APPROVAL E O'Hall 20 Dec 62
NASA APPROVAL [illegible] 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

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LOGIC FLOW
STICK "A"

CODE IDENT NO
SIZE E
NASA DRAWING NO. 1006513
SCALE NONE
WT
SHEET 1 OF 1

1006513 D

INCHES
0 1 2
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REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	CHANGED PER TDRR 00289	2-21-63	ECH	WK
B	CHANGED PER TDRR 00516	3-6-63	ECH	WK
C	CHANGED PER TDRR 00912	4-15-63	ECH	WK
D	CHANGED PER TDRR 01167	5-8-63	ECH	WK
E	CHANGED PER TDRR 01252	5-15-63	ECH	WK

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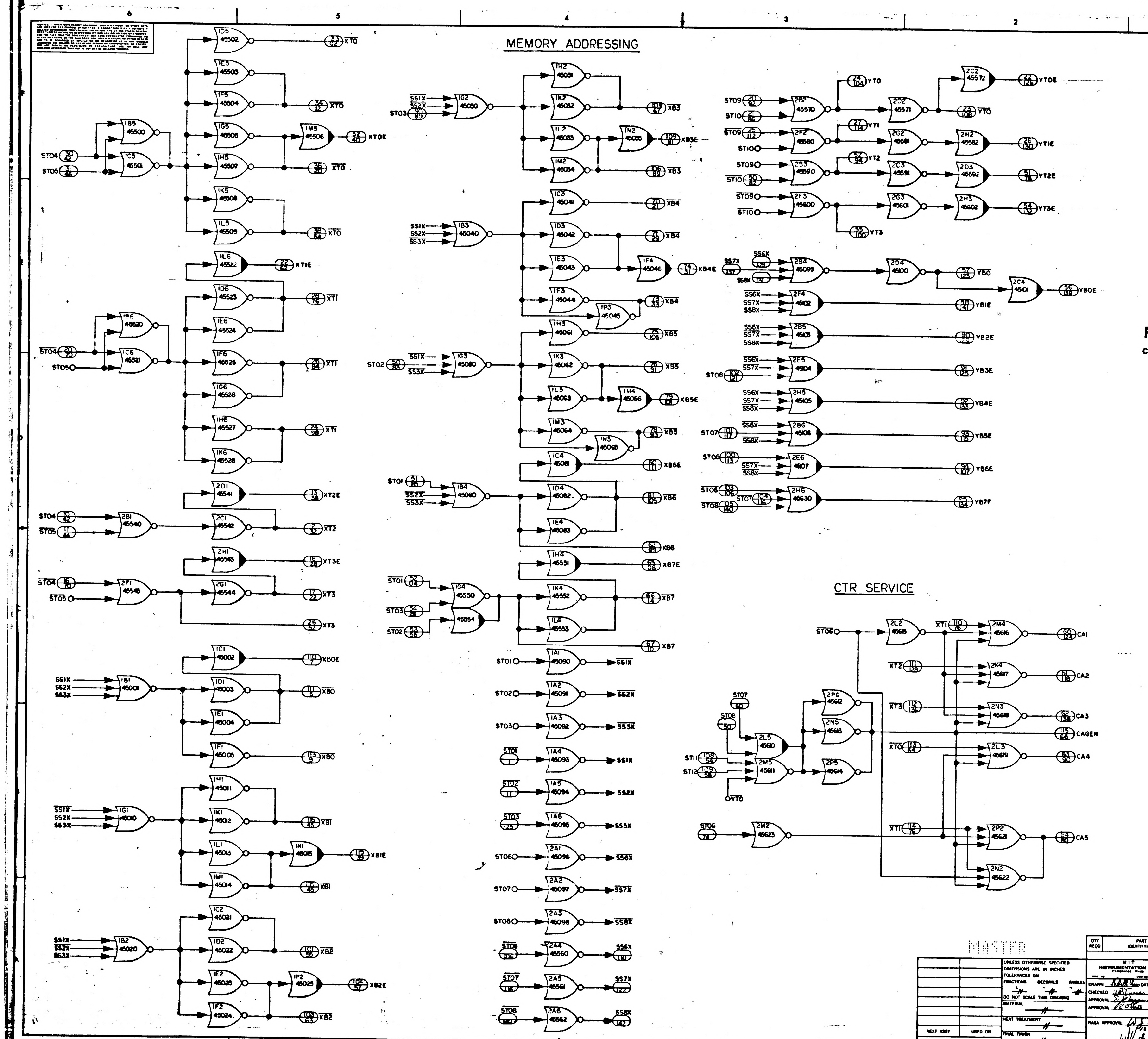
MEMORY ADDRESSING
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1E5 45503
1F5 45504
34/12 XT0
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1M5 45506
32/40 XT0E
1H5 45507
36/20 XT0
1K5 45508
1L5 45509
38/64 XT0
1B5 45500
1C5 45501
ST04 30/42
ST05 31/65
1L6 45522
22/62 XT1E
1D6 45523
28/76 XT1
1E6 45524
1F6 45525
25/84 XT1
1G6 45526
1H6 45527
24/98 XT1
1K6 45528
1B6 45520
1C6 45521
ST04 20/70
ST05
2D1 45541
13/38 XT2E
2C1 45542
12/30 XT2
2B1 45540
ST04 10/42
ST05 11/64
2H1 45543
18/28 XT3E
2G1 45544
17/22 XT3
2F1 45545
ST04 16/70
ST05
23/52 XT3
1C1 45002
110/7 XB0E
1D1 45003
111/4 XB0
1E1 45004
1F1 45005
113/5 XB0
1B1 45001
SS1X
SS2X
SS3X
1H1 45011
1K1 45012
116/43 XB1
1L1 45013
1N1 45015
119/39 XB1E
1M1 45014
118/48 XB1
1G1 45010
1C2 45021
1D2 45022
101/55 XB2
1E2 45023
1P2 45025
104/57 XB2E
1F2 45024
103/63 XB2
1B2 45020
1G2 45030
ST03 50/89
1H2 45031
1K2 45032
107/67 XB3
1L2 45033
1N2 45035
109/81 XB3E
1M2 45034
108/89 XB3
1C3 45041
70/21 XB4
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71/29 XB4
1E3 45043
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1M4 45066
79/101 XB5E
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1N3 45065
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1G3 45060
ST02 50/83
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80/111 XB6E
1D4 45082
81/105 XB6
1E4 45083
82/99 XB6
1B4 45080
ST01 51/85
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85/08 XB7E
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86/14 XB7
1L4 45553
67/10 XB7
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ST02 53/38
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ST03 1A3 45092 SS3X
ST01 1 1A4 45093 SS1X
ST02 11 1A5 45094 SS2X
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ST07 2A2 45097 SS7X
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ST06 106 2A4 45560 SS6X 110
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2B2 45570
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2D2 45571
2C2 45572
22/126 YT0E
23/108 YT0
ST09 25/112
ST10
2F2 45580
27/114 YT1
2G2 45581
2H2 45582
26/130 YT1E
ST09
ST10 50/82
2B3 45590
52/94 YT2
2C3 45591
2D3 45592
51/78 YT2E
ST09
ST10
2F3 45600
2G3 45601
2H3 45602
54/132 YT3E
55/100 YT3
SS7X 137
SS6X 109
SS8X 131
2B4 45099
2D4 45100
57/121 YB0
2C4 45101
56/139 YB0E
SS6X SS7X SS8X
2F4 45102
58/141 YB1E
2B5 45103
90/117 YB2E
2E5 45104
ST08 102/127
91/125 YB3E
2H5 45105
92/133 YB4E
2B6 45106
ST07 101/117
93/115 YB5E
2E6 45107
ST06 100/113
94/107 YB6E
2H6 45630
ST06 103/106
ST07 104/116
ST08 105/140
95/134 YB7F
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2L2 45615
XT1 110/76
2M4 45616
60/124 CA1
XT2 111/128
2K4 45617
61/118 CA2
XT3 112/132
2N3 45618
62/138 CA3
115/66 CAGEN
XT0 113/64
2L3 45619
63/90 CA4
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ST08 50
ST11 108/58
ST12 109/56
YT0
2L5 45610
2M5 45611
2P6 45612
2N5 45613
2P5 45614
ST06 74
2M2 45623
XT1 114/76
2P2 45621
64/80 CA5
2N2 45622

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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CONTRACT
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CHECKED 20 Dec 62
APPROVAL
APPROVAL
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

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HOUSTON, TEXAS

LOGIC FLOW
STICK "A"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006513
SCALE NONE
WT
SHEET 1 OF 1

1006513 F

INCHES
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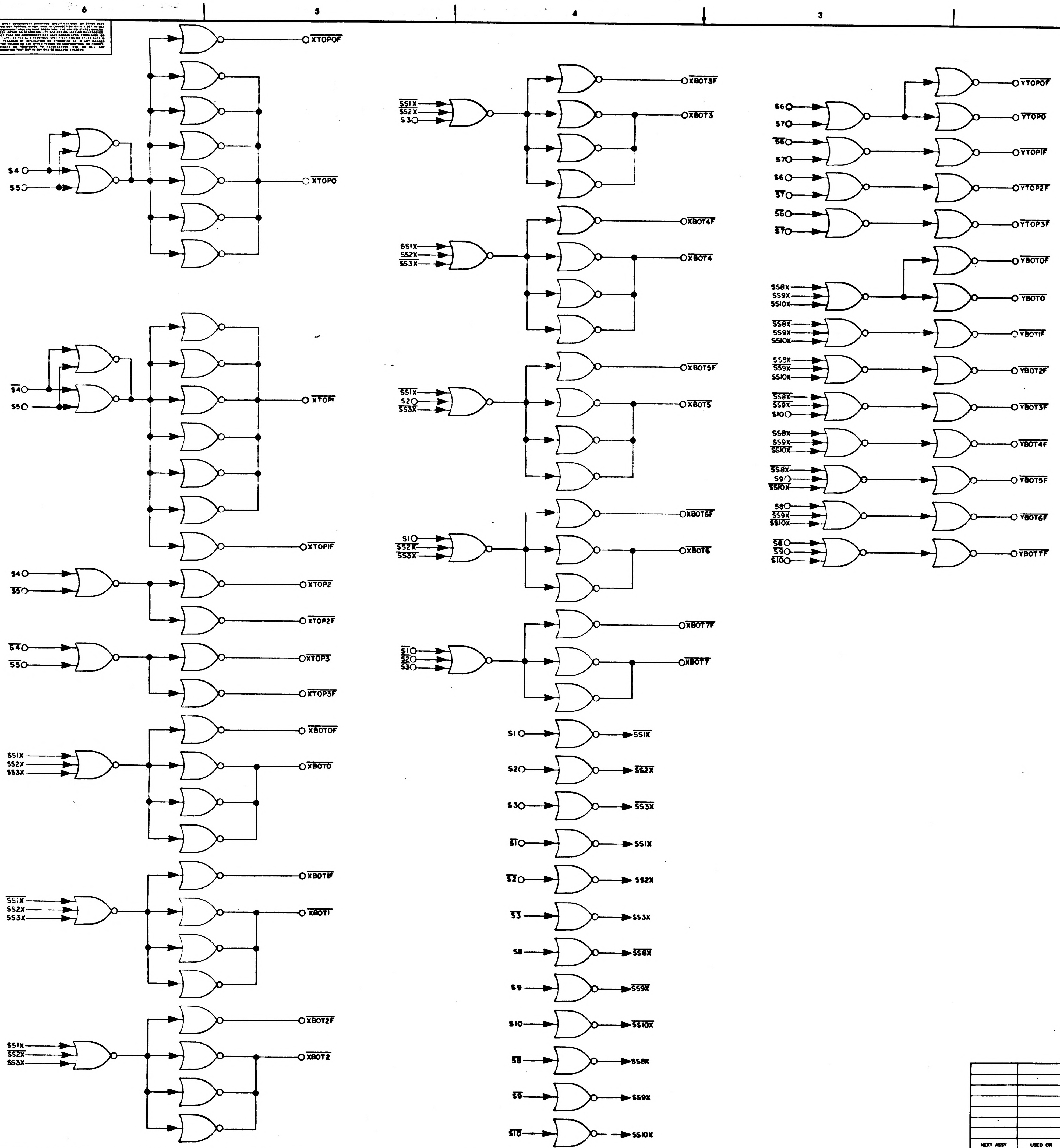
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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S5
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$\overline{S4}$
S5
$\overline{XTOPI}$
$\overline{XTOPIF}$
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SS1X
SS2X
SS3X
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$\overline{XBOTO}$
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SS2X
SS3X
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SS3X
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$\overline{XBOT2}$
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$\overline{SS2X}$
S3
$\overline{XBOT3F}$
$\overline{XBOT3}$
SS1X
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S2 → $\overline{SS2X}$
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S7
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CLASS B RELEASE TDR No. 00175 DATE 12-20-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

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TOLERANCES ON
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DO NOT SCALE THIS DRAWING
MATERIAL //
HEAT TREATMENT //
FINAL FINISH //

M.I.T.
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO CONTRACT
DRAWN DATE
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "A"

CODE IDENT NO | SIZE E | NASA DRAWING NO. 1006513
SCALE NONE | WT | SHEET 1 OF 1

1006513

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRK 00288		

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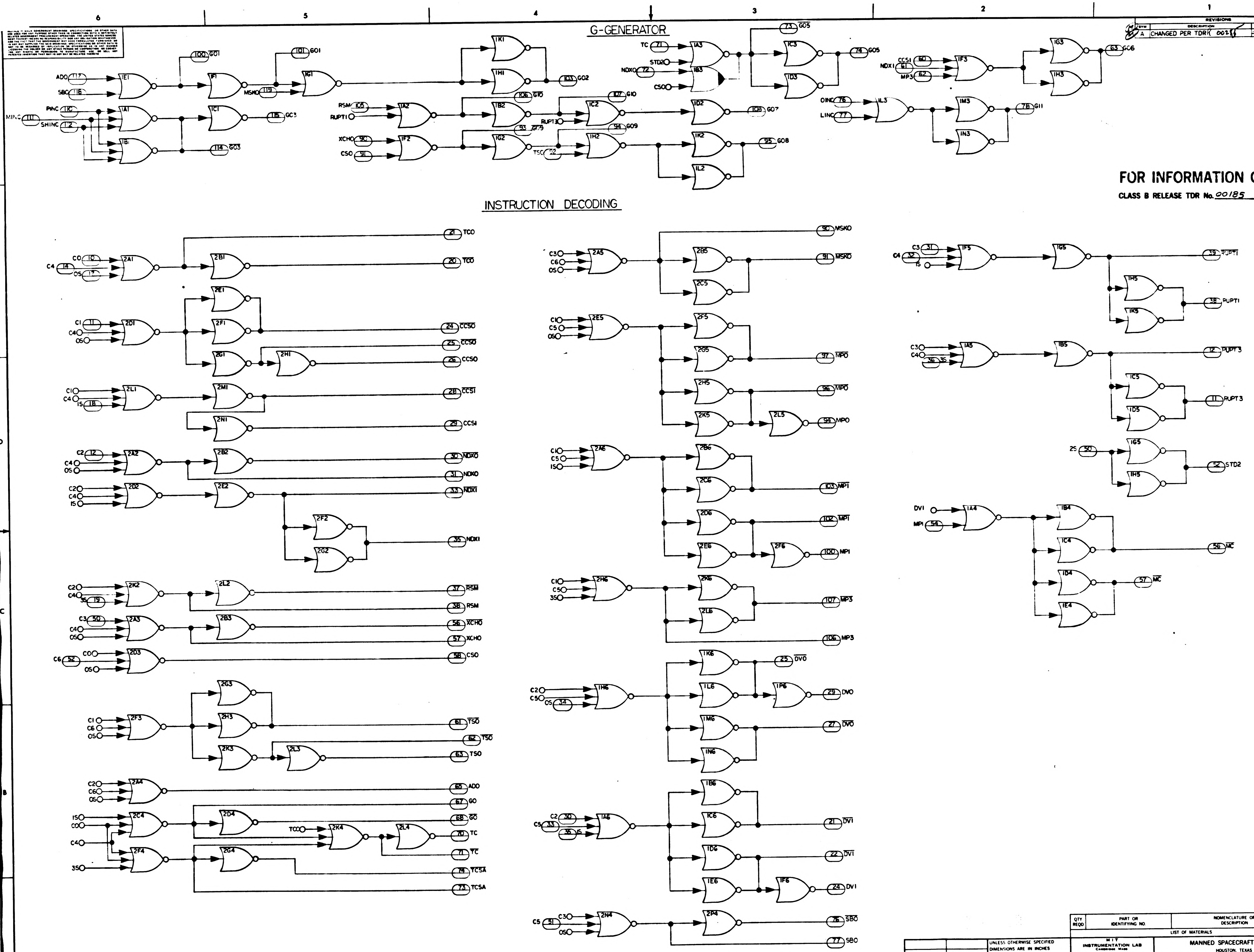
CLASS B RELEASE TDR No. 00185 DATE 12-20-62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94 G09
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1G2
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STD2
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1C3
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1K2
1L2
95 GO8
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MP3 62
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2B3
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2L4
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71 TC
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C6
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2B5
2C5
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91 MSKO
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C5
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2K5
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57 MC

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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DRAWN B.H. DATE 8-10-62
CHECKED NC [illegible]
APPROVAL [illegible] 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "E"

CODE IDENT NO
SIZE E
NASA DRAWING NO 1006514
SCALE —
WT
SHEET 1 OF 1

1006514

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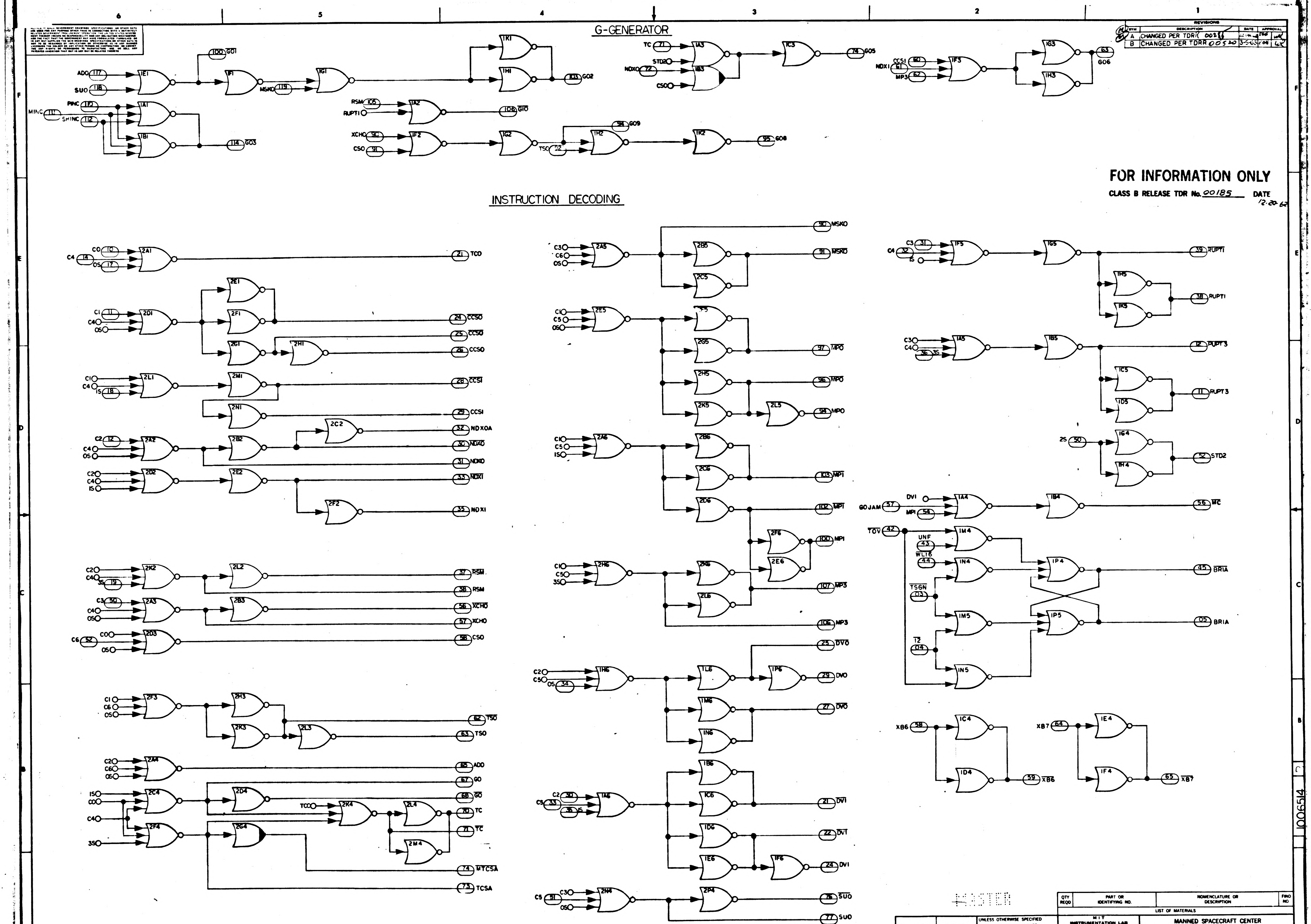
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
A	CHANGED PER TDRR 002			
B	CHANGED PER TDRR 00520	3-5-63		

G-GENERATOR

INSTRUCTION DECODING



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MINC 111
SHINC 112
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TSO 92
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1C3
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FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00185 DATE 12-20-62

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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MATERIAL —

HEAT TREATMENT —

FINAL FINISH —

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DWG NO CONTRACT

DRAWN Bell DATE 12-19-62
CHECKED W Duncan 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62

NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "E"

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006514

SCALE — | WT | SHEET 1 OF 1

1006514

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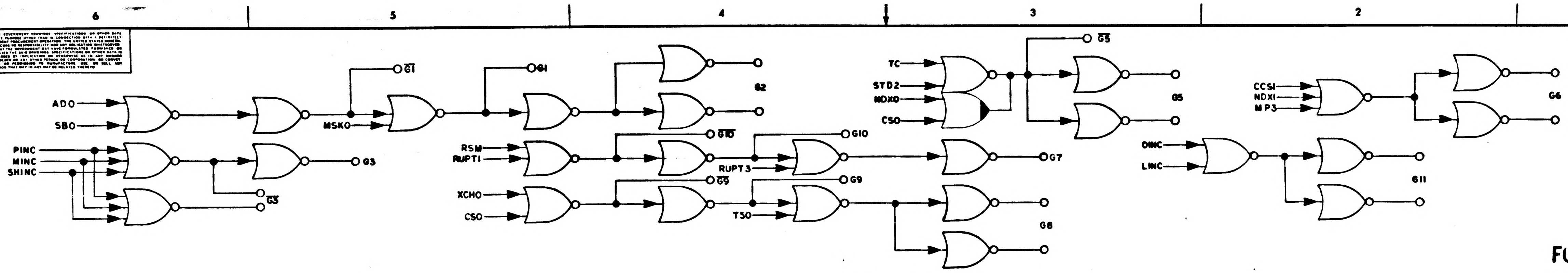
SYM	DESCRIPTION	DATE	APPROVAL

REVISIONS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G2
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CSO
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G10
RUPT3
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G9
TSO
G7
G8
TC
STD2
NDXO
CSO
$\overline{G5}$
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CCSI
NDXI
MP3
G6
OINC
LINC
G11

G-GENERATOR

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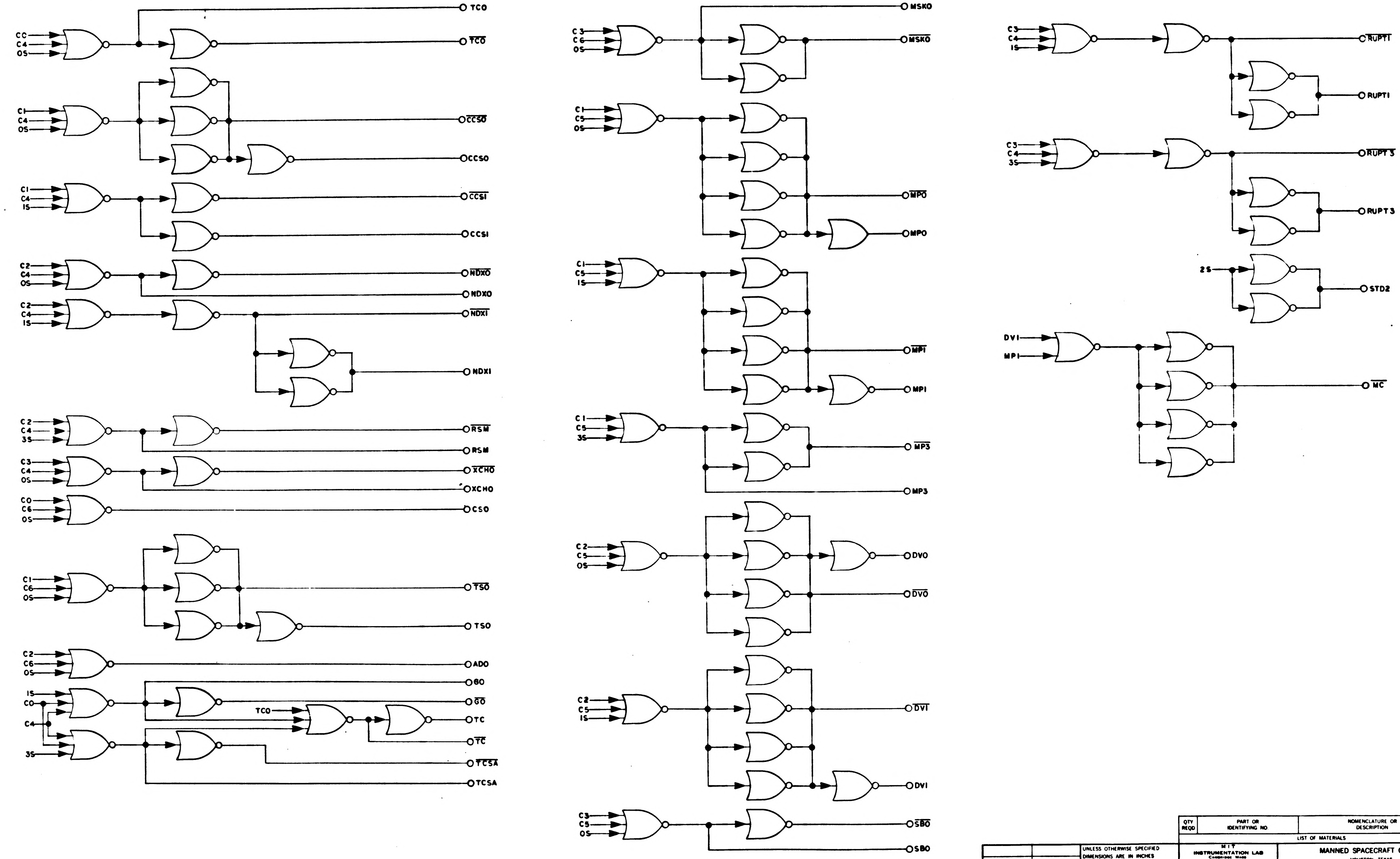
CLASS B RELEASE TDR No. 00185 DATE 12-20-62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DV1
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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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CONTRACT

DRAWN Bell DATE 2-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "E"

CODE IDENT NO
SIZE E
NASA DRAWING NO. 1006514
SCALE —
WT
SHEET 1 OF 1

1006514

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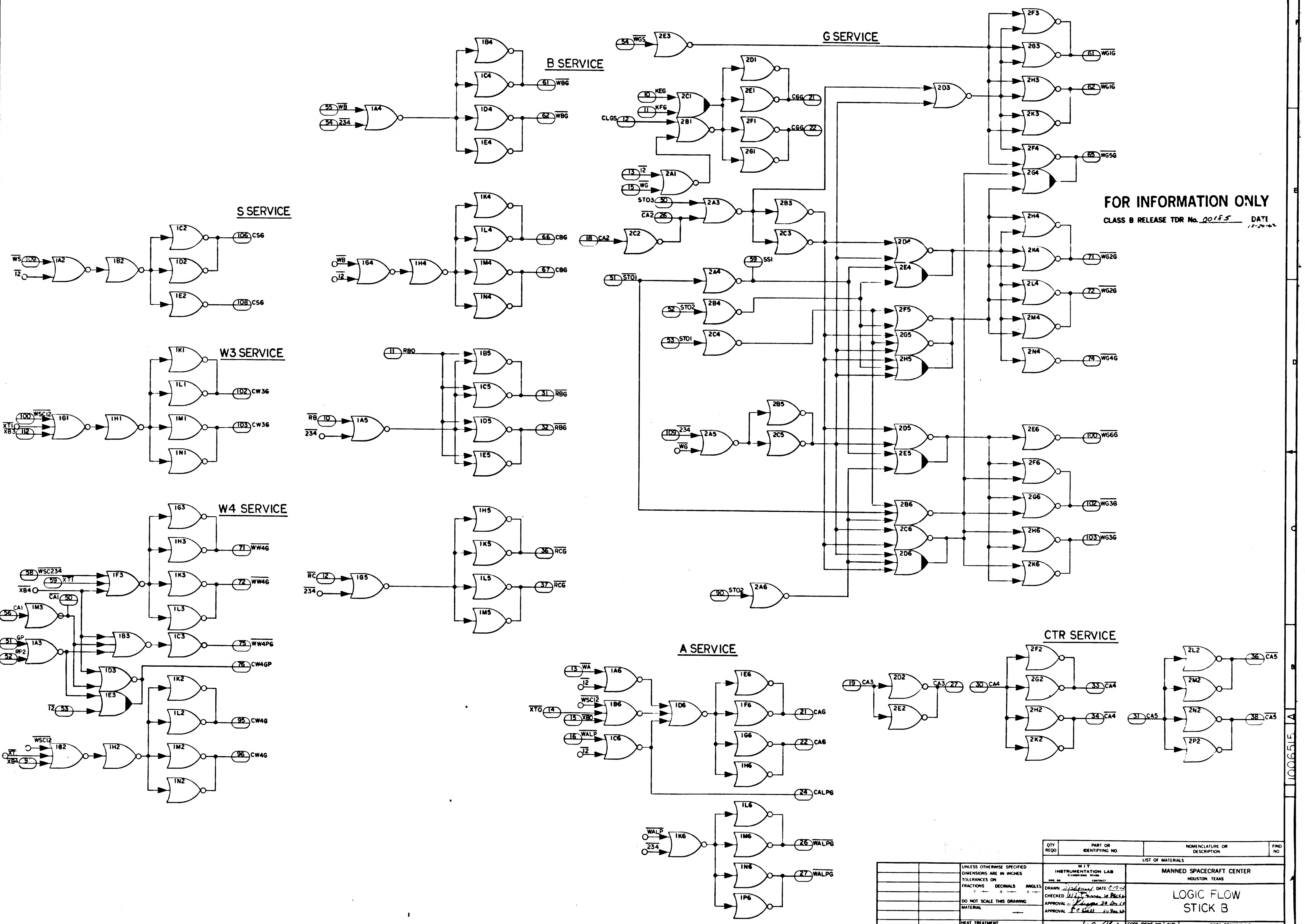
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRR NO. 00284		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W4 SERVICE
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G SERVICE
A SERVICE
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1B2
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1E2
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108 CSG
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XT1
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1M5
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37 RCG
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2E3
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2F1
2G1
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CGG 22
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2C3
18 CA2
2C2
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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

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CAMBRIDGE MASS
DWG NO CONTRACT

DRAWN Wiskeman DATE 2-19-62
CHECKED W. J. [illegible] 20 Dec 62
APPROVAL [illegible] 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK B

CODE IDENT NO. SIZE E NASA DRAWING NO 1006515
SCALE WT SHEET OF

1006515 A

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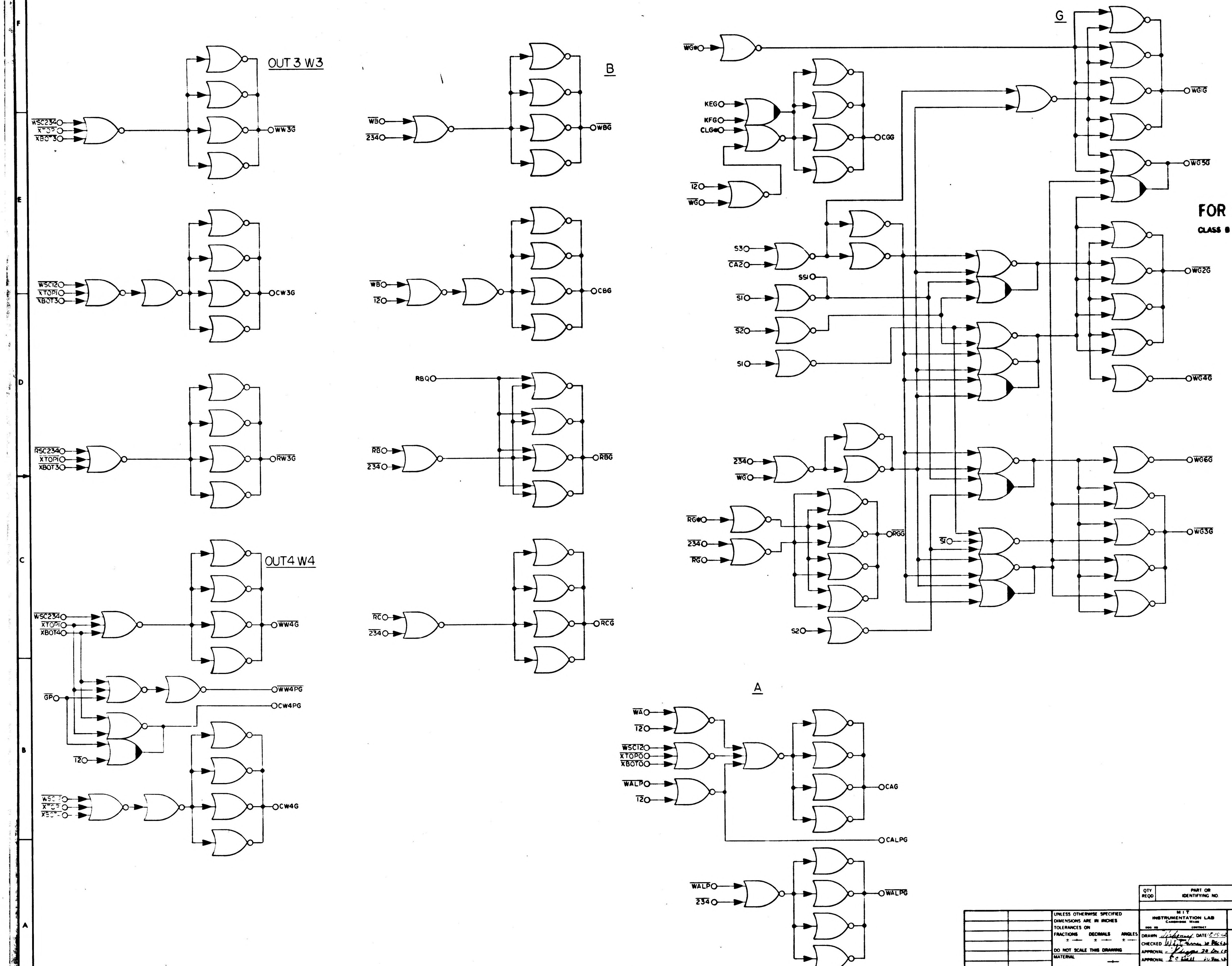
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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$\overline{WG*}$
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KFG
CLG*
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CLASS B RELEASE TDR No. 00185 DATE 12-20-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT

DRAWN DATE 12-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK B

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006515
SCALE
WT
SHEET OF

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SYM	DESCRIPTION	DATE	APPROVAL
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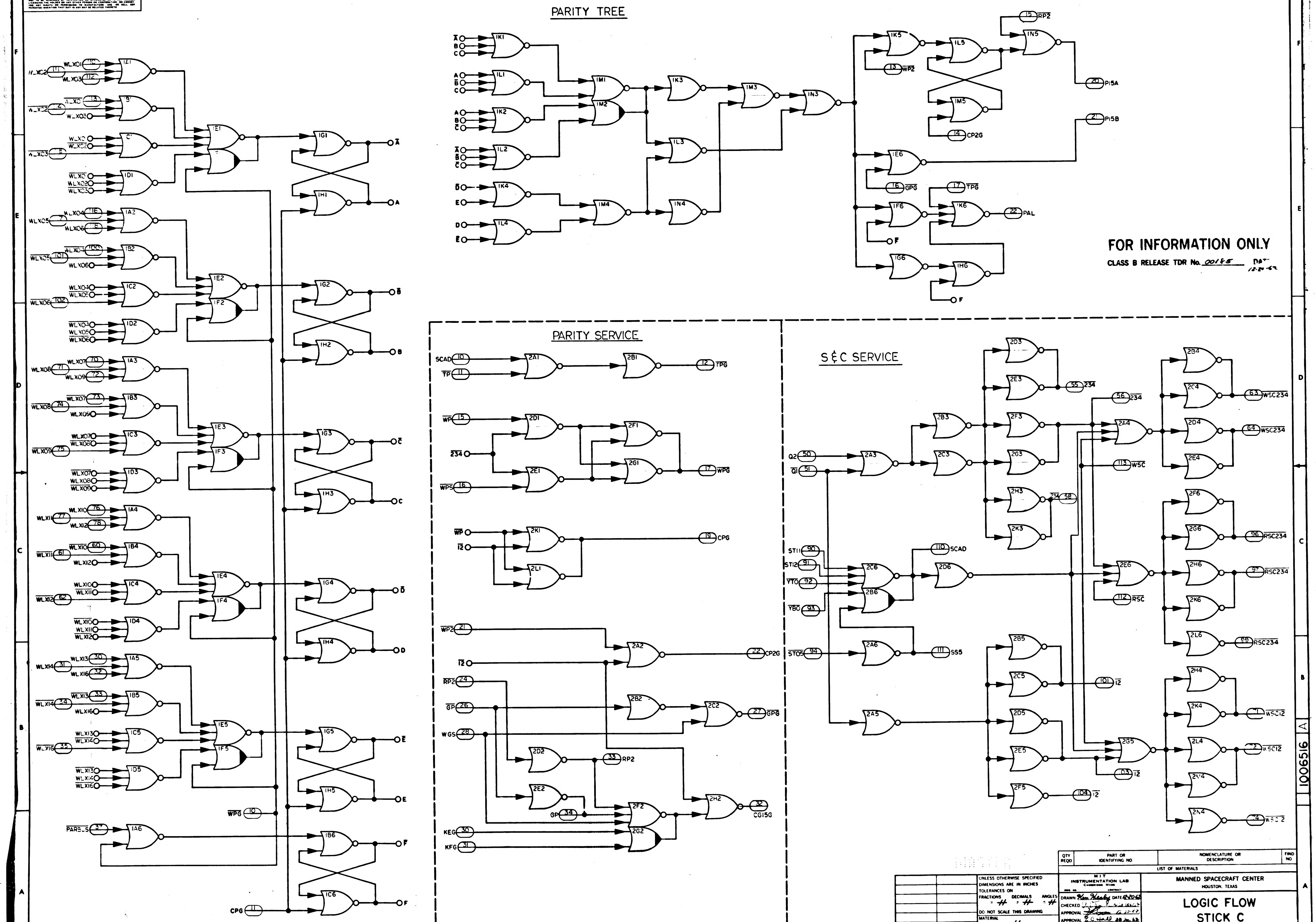
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WLX01 WLX03 WLX02 WLX04 WLX05 WLX06 WLX07 WLX08 WLX09 WLX10 WLX11 WLX12 WLX13 WLX14 WLX16
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WPG
CPG
A B C D E F
15 RP2
13 WP2
14 CP2G
20 P15A
21 P15B
16 GPG
17 TPG
22 PAL
SCAD TP WP 234 WPS 12
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17 WPG
19 CPG
WP2 RP2 GP WGS KEG KFG
22 CP2G
27 GPG
33 RP2
32 CG15G
GP 34
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56 234
63 WSC234
64 WSC234
113 WSC
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Q1 51
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ST12 91
YT0 92
YB0 93
ST05 94
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111 SS5
112 RSC
96 RSC234
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103 12
104 12
WSC12
WSC12
WSC12

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CLASS B RELEASE TDR No. 00185 DATE 12-20-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING
MATERIAL #
HEAT TREATMENT #
FINAL FINISH #

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO
CONTRACT
DRAWN Ken Healy DATE 12-20-62
CHECKED [illegible] 12-20-62
APPROVAL [illegible] 12-20-62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW STICK C

CODE IDENT NO
SIZE E
NASA DRAWING NO 1006516
SCALE #
WT
SHEET 1 OF 1

1006516 A

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REVISIONS

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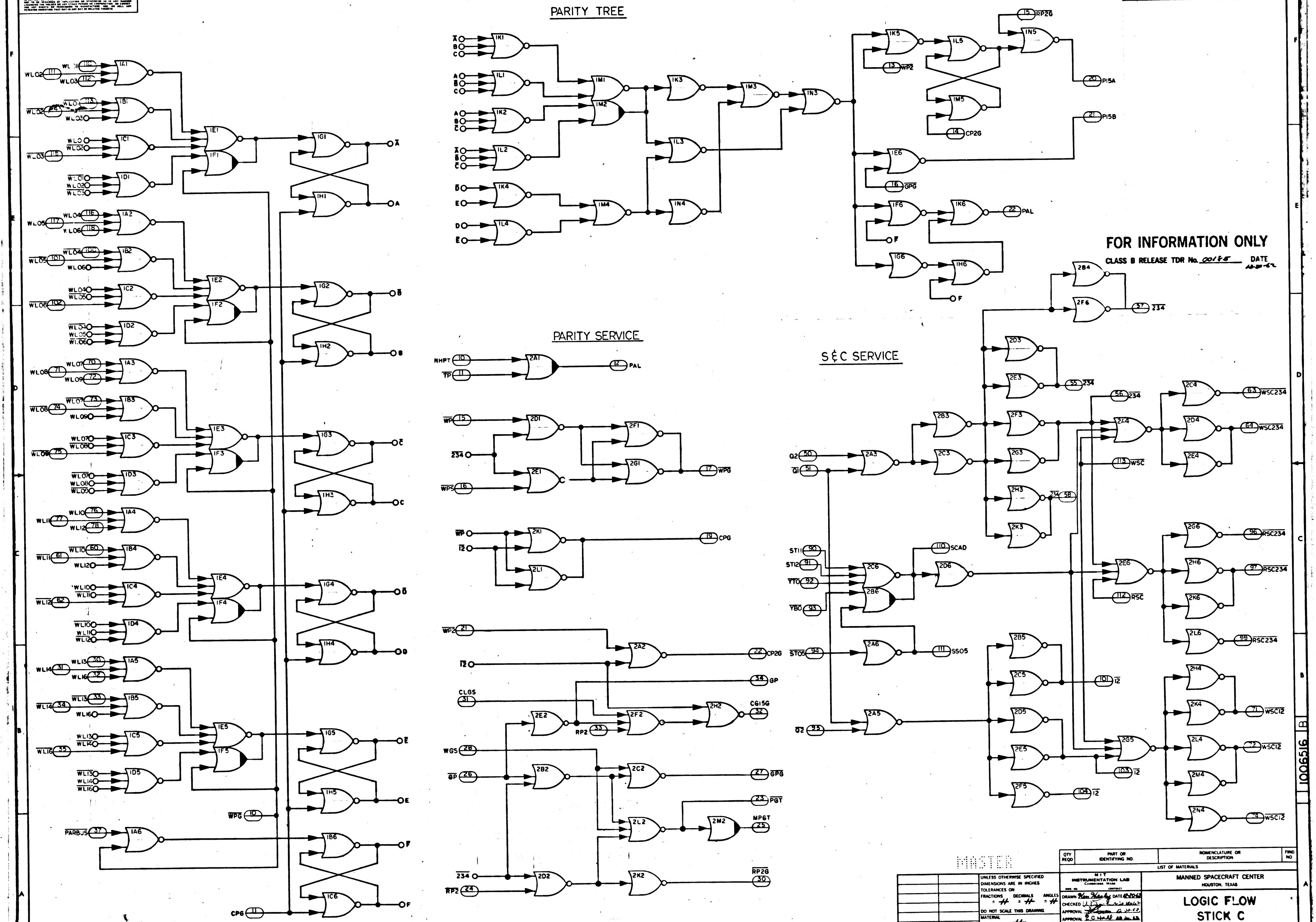
B	REVISED PER TDRR 00519	2-28-63		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PARITY SERVICE
S&C SERVICE
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CPG
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CP2G
GP
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RSC
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Q2
Q1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00185 DATE 12-20-62

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DIMENSIONS ARE IN INCHES
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MATERIAL #
HEAT TREATMENT #
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DRAWN Ken Healy DATE 12-20-62
CHECKED 12-20-62
APPROVAL 12-20-62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W J R 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK C

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006516

SCALE # WT SHEET 1 OF 1

1006516 B

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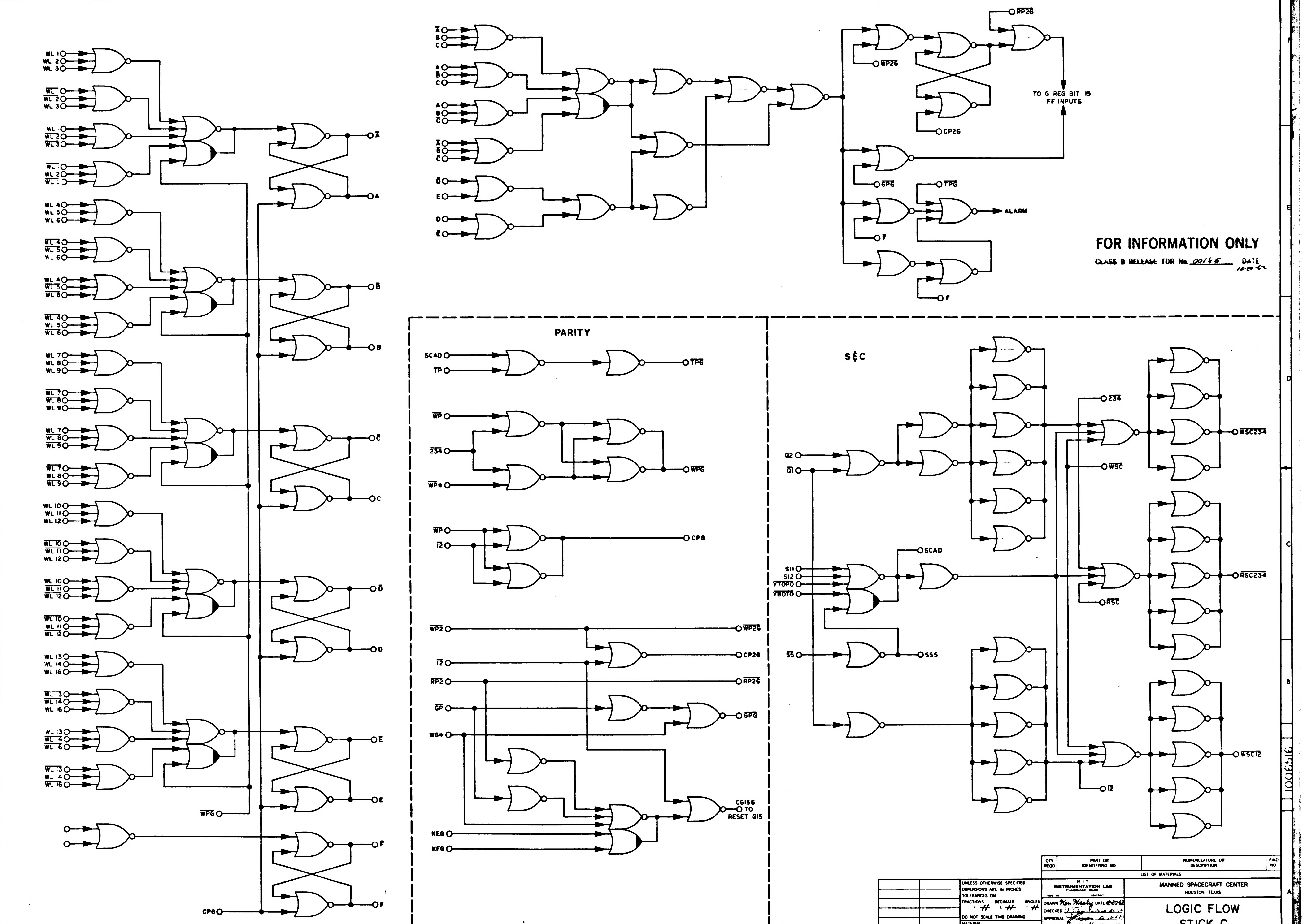
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



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PARITY
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WG*
KEG
KFG
CG15G
TO RESET G15
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Q2
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S12
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CLASS B RELEASE TDR No. 00185 DATE 12-20-62

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
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APPROVAL
APPROVAL E C Hall
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK C

CODE IDENT NO	SIZE	NASA DRAWING NO
	E	1006516

SCALE // WT SHEET 1 OF 1

1006516

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REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
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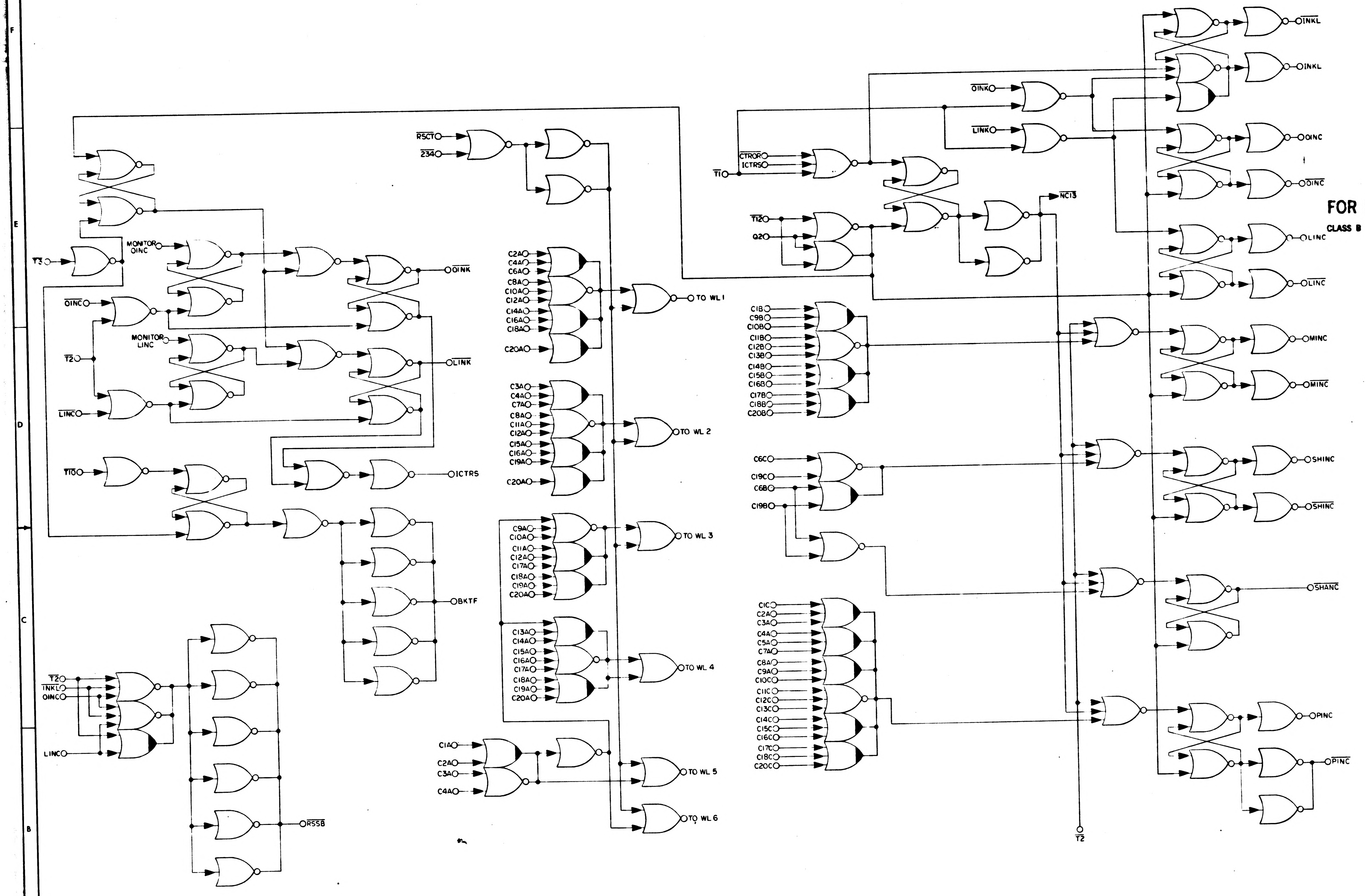
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LINC
RSSB
R5CT
234
C2A
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C18A
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C14A
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C20A
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C3A
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TO WL 5
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CTROR
ICTRS
T1
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Q2
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LINK
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C10C
C11C
C12C
C13C
C14C
C15C
C16C
C17C
C18C
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T2
INKL
INKL
OINC
OINC
LINC
LINC
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MINC
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SHINC
SHANC
PINC
PINC

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00185 DATE 12-20-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
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APPLICATION	

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MATERIAL
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN DATE 1-8-63
CHECKED 1-8-63
APPROVAL
APPROVAL Eldon C Hall 9 Jan 63
NASA APPROVAL W J Rhine 1-9-63
MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK F

CODE IDENT NO | SIZE E | NASA DRAWING NO 1006517
SCALE — | WT | SHEET OF

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00[illegible]	1-8-63	W.T.	WR
B	CHANGED PER TDRR 00313	1-30-63	ECH	[illegible]

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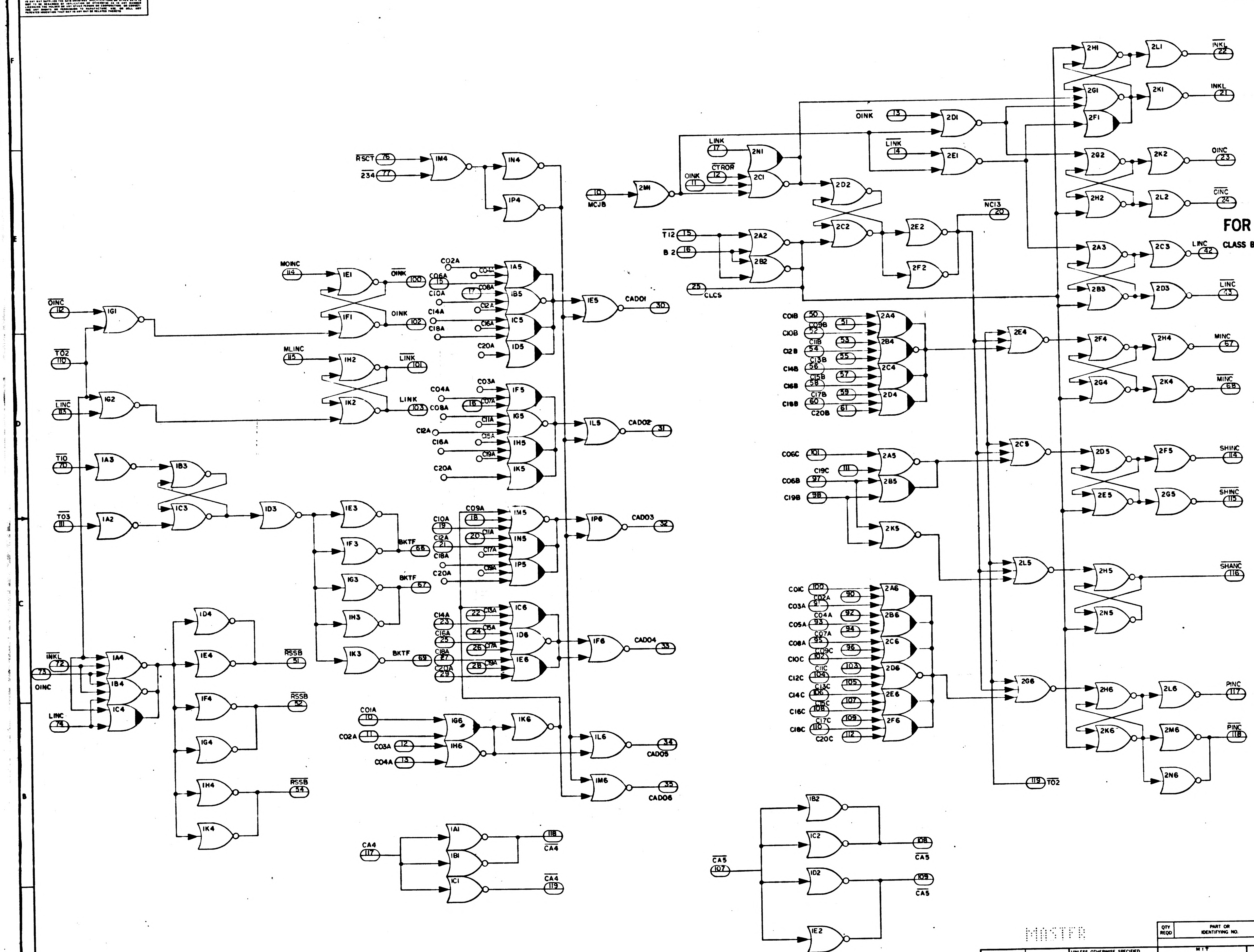
CLASS B RELEASE TDR No. 00185 DATE
12-20-62



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CTROR 12
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OINK 13
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LINK 14
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2F2
NC13 20
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108 CA5
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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN Mahoney DATE 1-8-63
CHECKED [illegible] 1-8-63
APPROVAL
APPROVAL Eldon C. Hall 9 Jan 63
NASA APPROVAL W. J. Rhine 1-9-63
MIT APPROVAL [illegible] 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK F

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006517
SCALE | WT | SHEET OF

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00226	1-8-63		
B	CHANGED PER TDRR 0033	-30-63		
C	CHANGED PER TDRR 00523	2-27-63		

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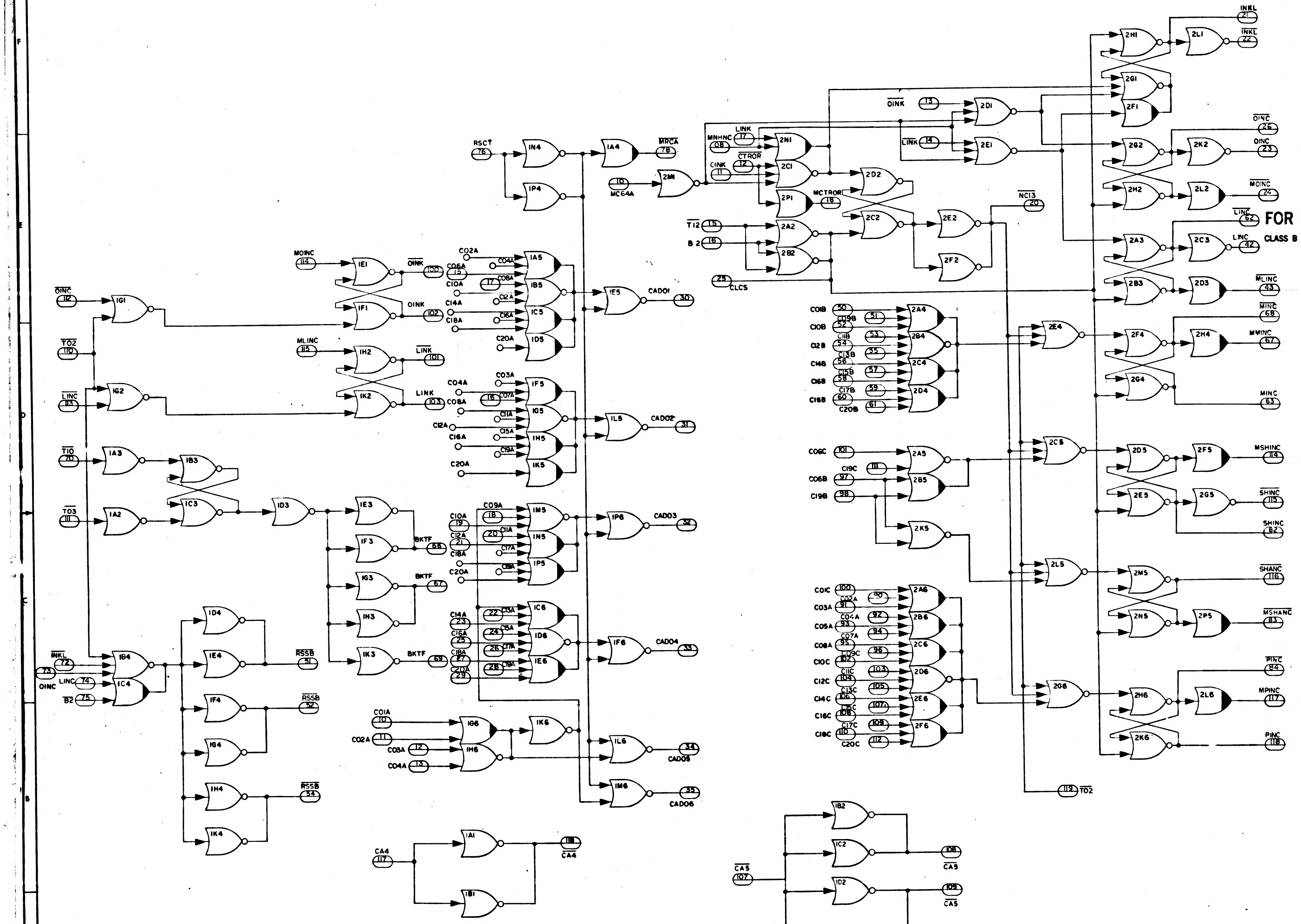
CLASS B RELEASE TDR No. 00185 DATE 12-20-62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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DOC NO CONTRACT
DRAWN Mahoney DATE 1-8-63
CHECKED 1-8-63
APPROVAL
APPROVAL 9 Jan 63
NASA APPROVAL 1-8-63
MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK F

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006517
SCALE —
WT
SHEET OF

1006517 C

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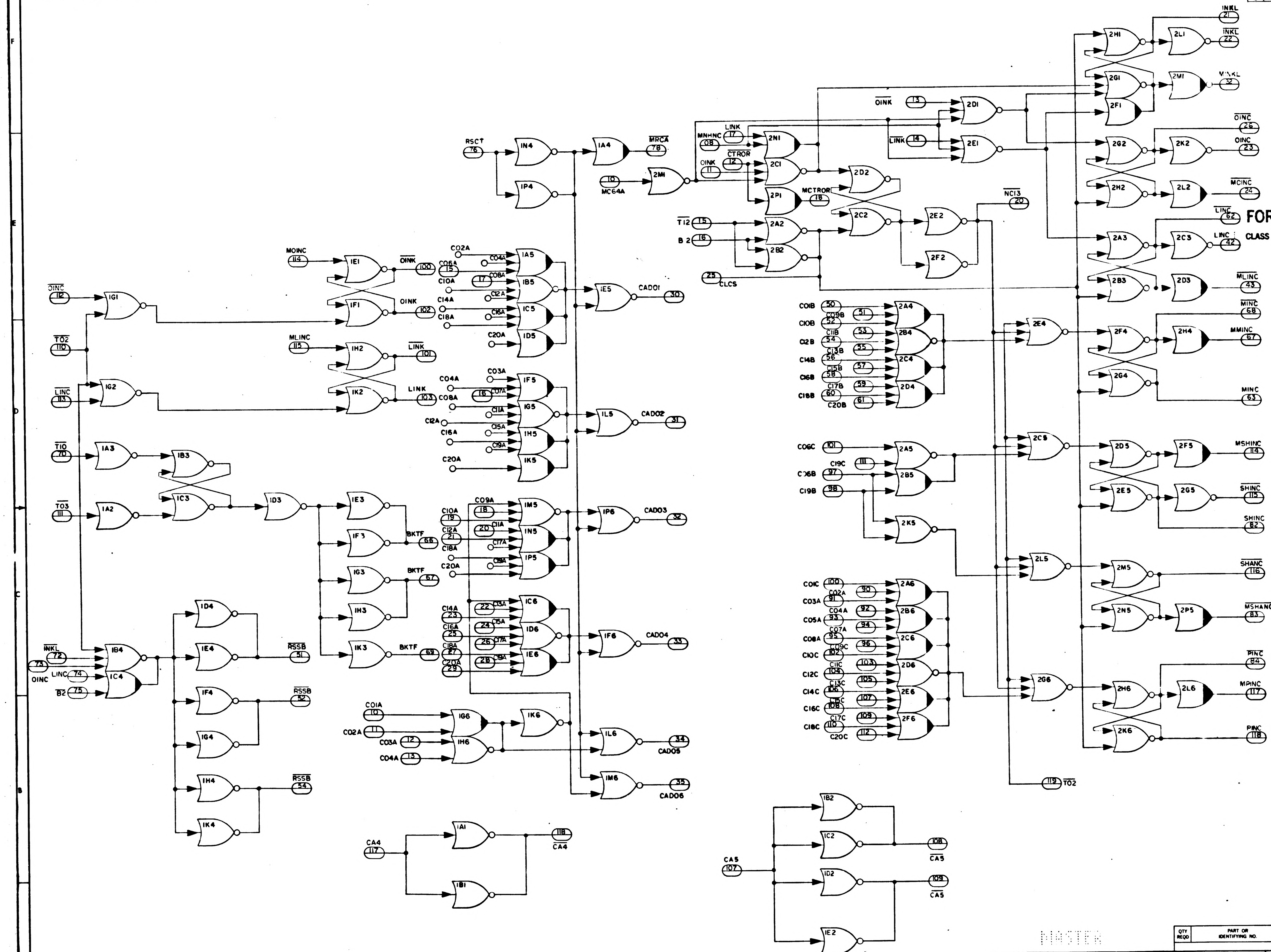
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR [illegible]	1 6 63		
B	CHANGED PER TDRR 003.3	1-30-63	ECH	
C	CHANGED PER TDRR 00523	2-27-63	ECH	
D	CHANGED PER TDRR 00915	[illegible]		

FOR INFORMATION ON

CLASS B RELEASE TDR No. 00185

12-20-62



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108 CA5
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MASTER

NEXT ASSY	USED ON
APPLICATION	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
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MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT

DRAWN Mahoney DATE 1-8-63
CHECKED [illegible] 1-8-63
APPROVAL
APPROVAL Eldon C. Hall 9 Jan 63
NASA APPROVAL [illegible] 1-9-63
MIT APPROVAL [illegible] 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

LOGIC FLOW
STICK F

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006517
SCALE —
WT
SHEET OF

INCHES
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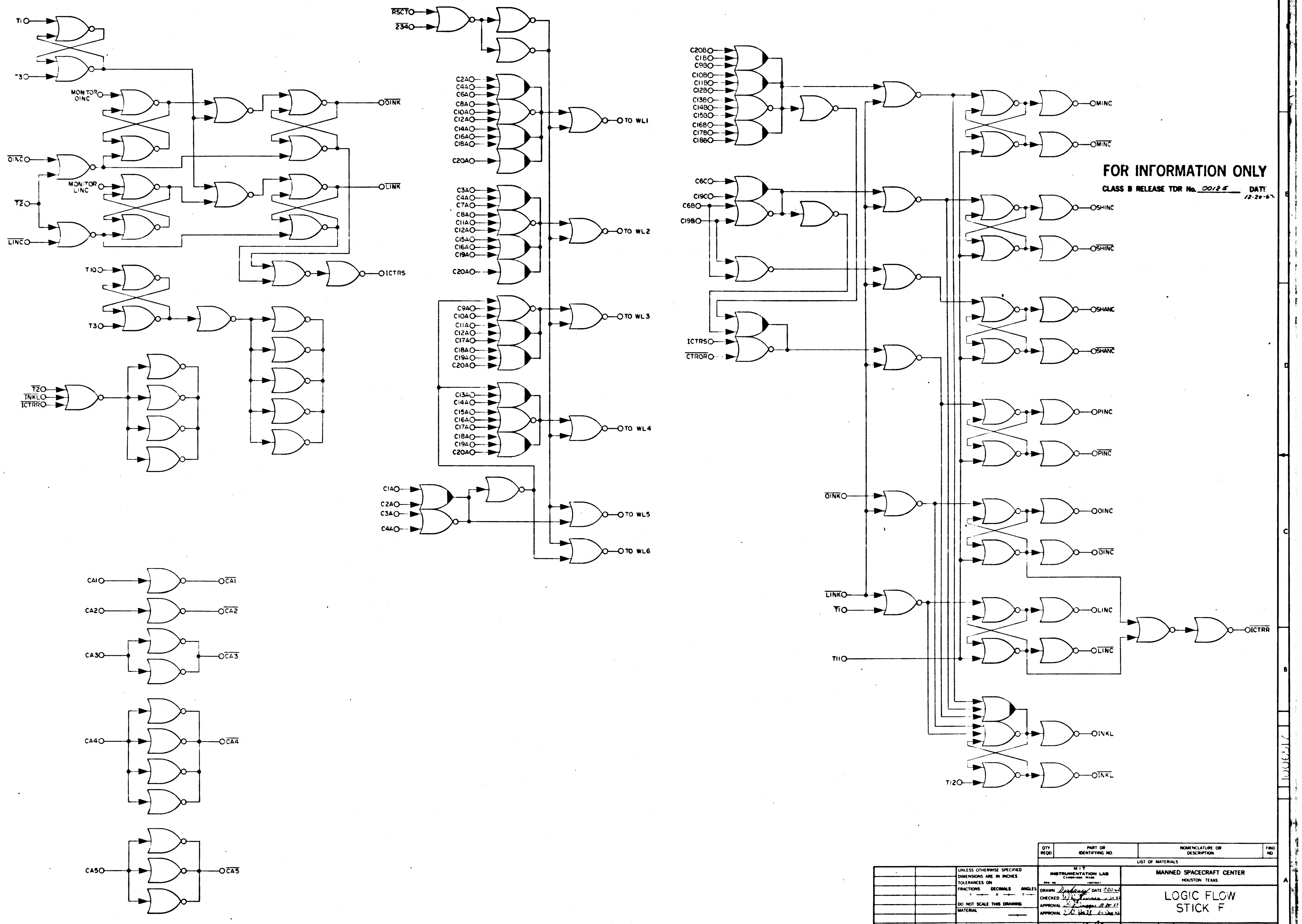
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00185 DATE 12-20-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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CAMBRIDGE MASS
DWG NO CONTRACT

DRAWN Mahoney DATE 12-20-62
CHECKED 12-20-62
APPROVAL 12-20-62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK F

CODE IDENT NO
SIZE E
NASA DRAWING NO 1006517
SCALE
WT
SHEET OF

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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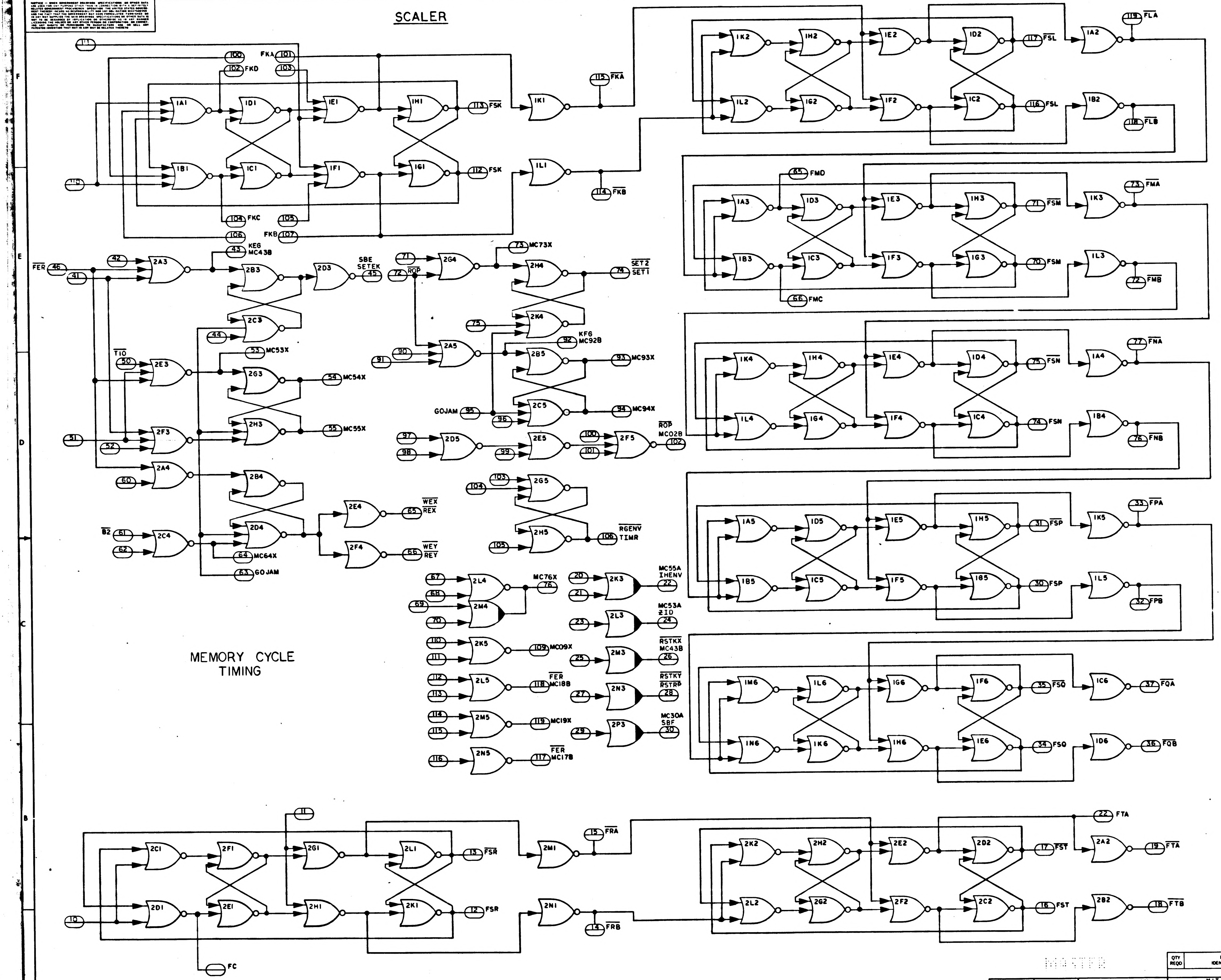
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MASTER

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LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT

DRAWN J. Fahey DATE 12-20-62
CHECKED W. Turner 8 JAN 63
APPROVAL W. Turner 12 FEB 63
APPROVAL Eldon C Hall 12 FEB 63
NASA APPROVAL W J Rhine 1-9-63
MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "G"

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006518
SCALE — WT SHEET 1 OF 1

E 1006518 A

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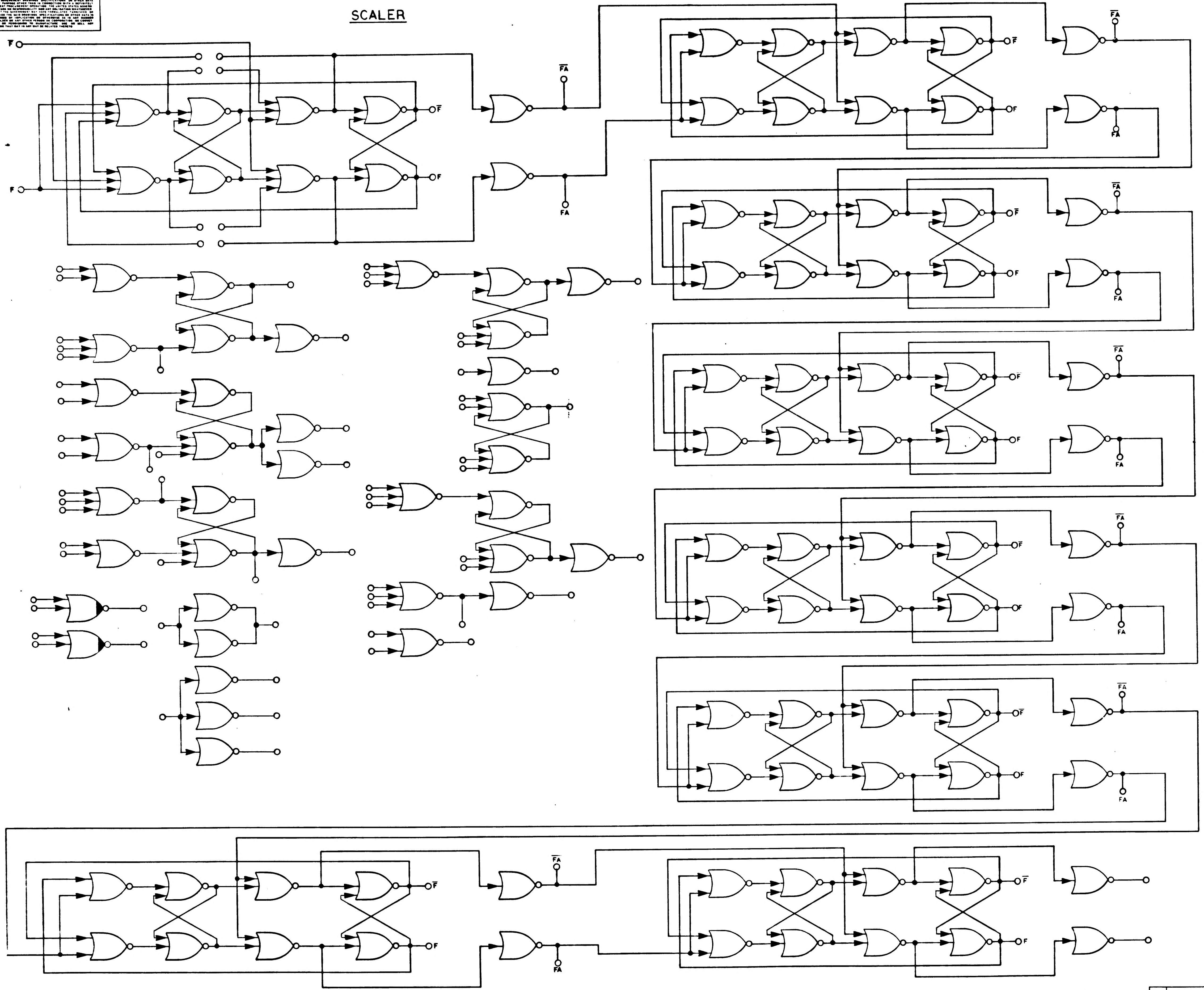
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



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HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN Z. Fabiany DATE 12-20-62
CHECKED W.J. Turner 8 JAN 63
APPROVAL
APPROVAL Eldon C Hall 8 Jan 63
NASA APPROVAL W.J. Rhine 1-9-63
MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "G"

CODE IDENT NO
SIZE E
NASA DRAWING NO 1006518
SCALE —
WT
SHEET 1 OF 1

1006518

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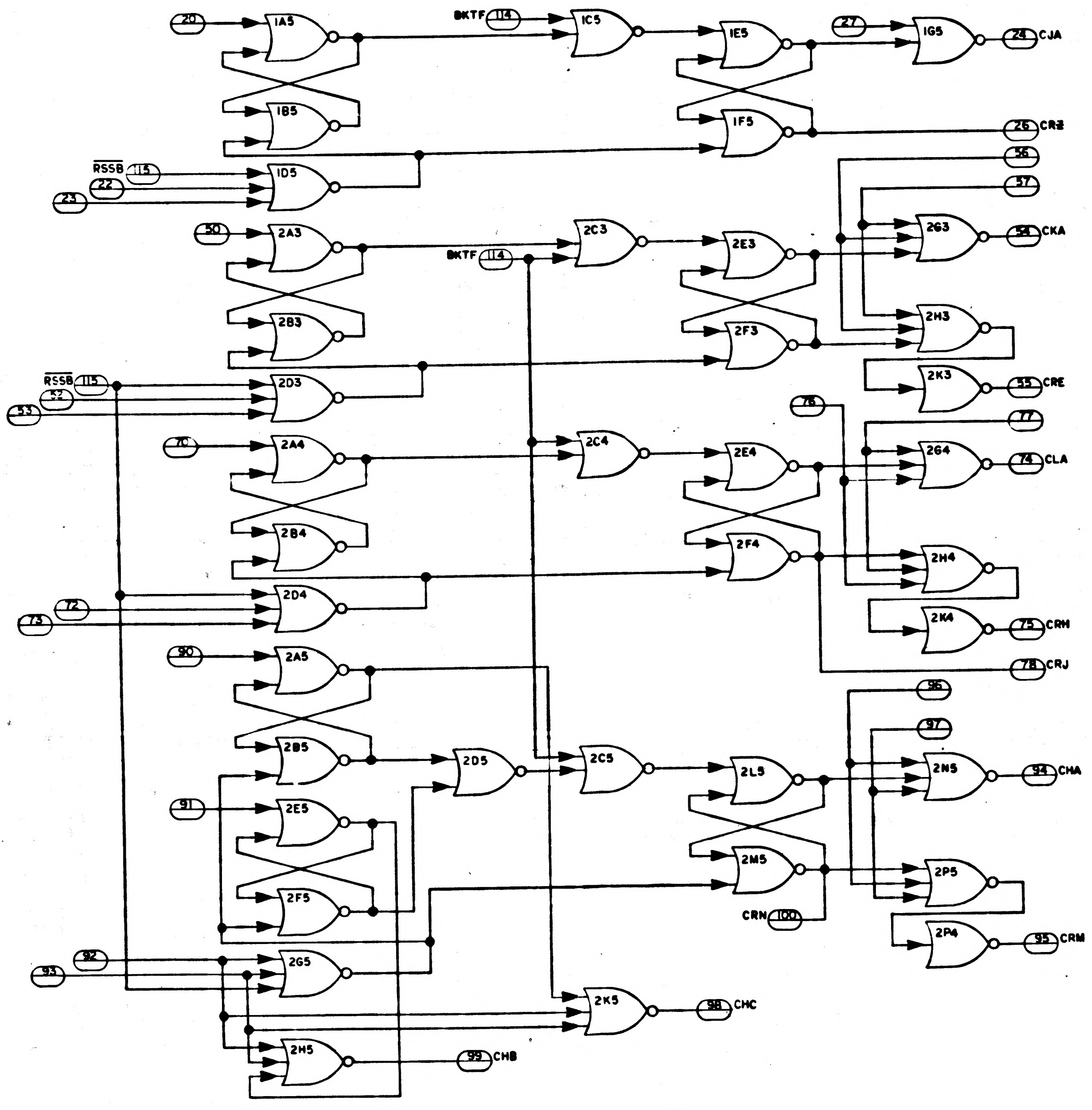
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRR 50310	30 Jan 63	RC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1E5
1F5
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1G5
24 CJA
26 CRZ
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23
1D5
50
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2B3
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2E3
2F3
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57
2G3
54 CKA
2H3
2K3
55 CRE
$\overline{RSSB}$ 115
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53
2D3
70
2A4
2B4
2C4
2E4
2F4
76
77
2G4
74 CLA
2H4
2K4
75 CRH
78 CRJ
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2D4
90
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2B5
2D5
2C5
2L5
2M5
CRN 100
96
97
2N5
94 CHA
2P5
2P4
95 CRM
91
2E5
2F5
92
93
2G5
2K5
98 CHC
2H5
99 CHB

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00226 DATE 1-9-63

1006519 A

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION

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DO NOT SCALE THIS DRAWING
MATERIAL —
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FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN J. Bell DATE 12-27-62
CHECKED 3 JAN 63
APPROVAL
APPROVAL Eldon C. Hall 9 Jan 63
NASA APPROVAL 1-9-63
MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "H"

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006519
SCALE NONE | WT | SHEET 1 OF 2

SYM	DESCRIPTION	DATE	APPROVAL	
A	CHANGED PER TDRR 00310	1/26/63		WK

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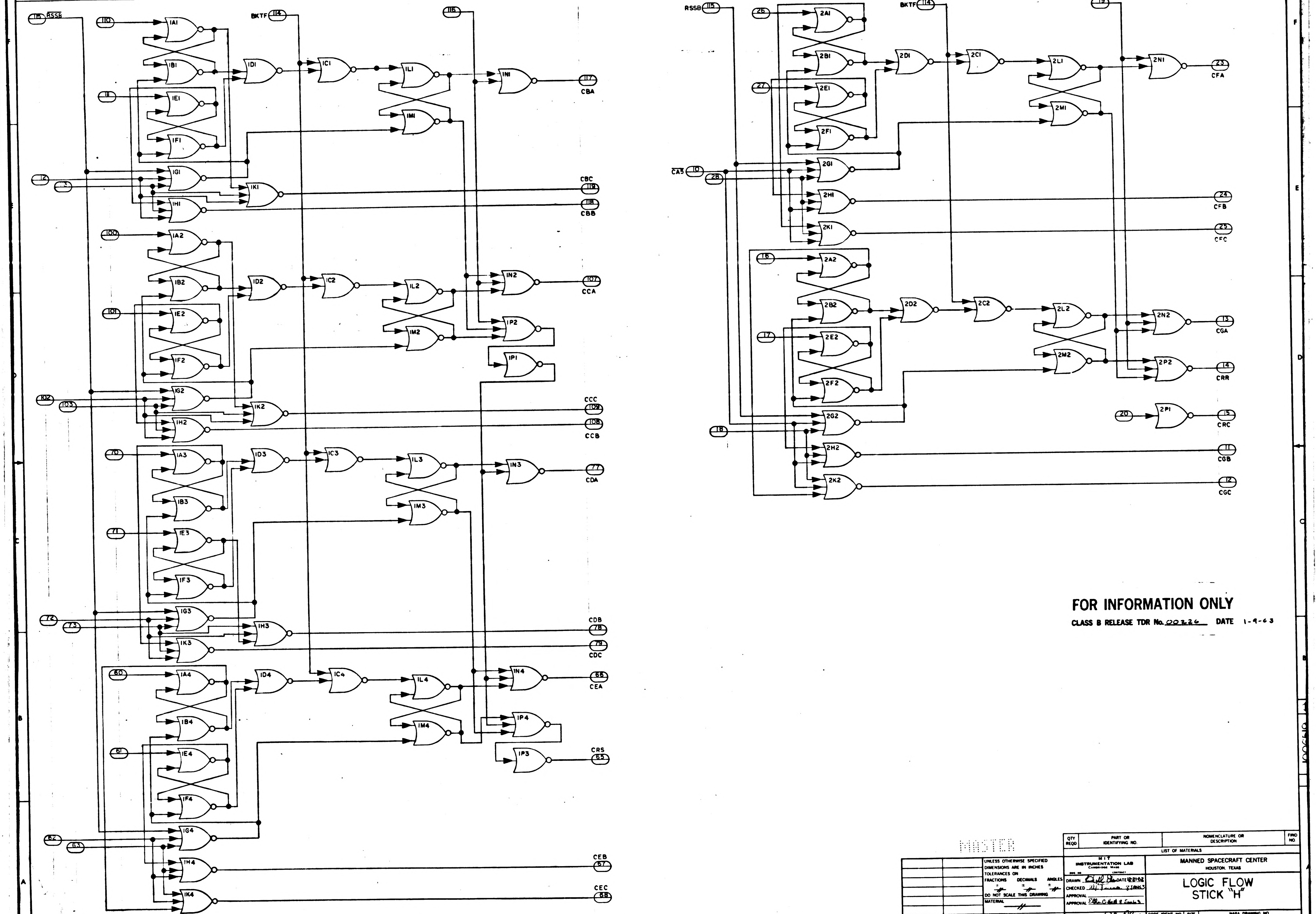

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1C2
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1H2
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1M3
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1K3
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79 CDC
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1D4
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CEC 68
RSSB 115
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15 CRC
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2H2
2K2
11 CGB
12 CGC

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CLASS B RELEASE TDR No. 00226 DATE 1-9-63

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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INSTRUMENTATION LAB
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DRAWN DATE 12-21-62
CHECKED 8 JAN 63
APPROVAL
APPROVAL 8 Jan 63
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MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "H"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006519
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS				
SYM	DESCRIPTION		DATE	APPROVAL
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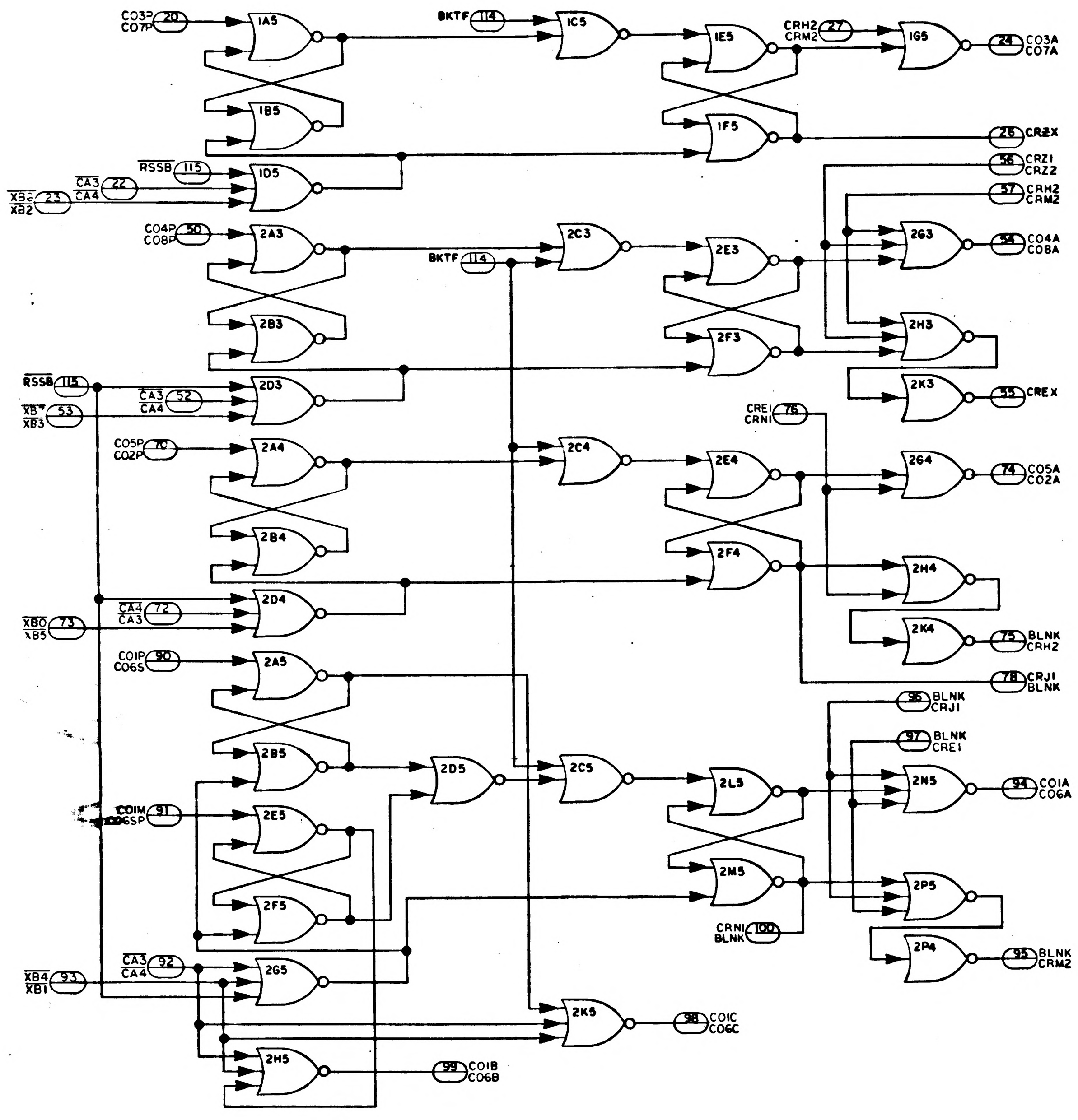
B	CHANGED PER TDRR	00521		ECH WR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CRH2 27 CRM2
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RSSB 115
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CA3 22 CA4
XB2 23 XB2
56 CRZ1 CRZ2
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CO4P 50 CO8P
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2B3
2C3
BKTF 114
2E3
2F3
2G3
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2H3
2K3
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RSSB 115
CA3 52 CA4
XB7 53 XB3
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CO5P 70 CO2P
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2B4
2C4
2E4
2F4
CRE1 76 CRN1
2G4
74 CO5A CO2A
2H4
2K4
75 BLNK CRH2
78 CRJ1 BLNK
CA4 72 CA3
XB0 73 XB5
2D4
CO1P 90 CO6S
2A5
2B5
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2P5
2P4
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CA3 92 CA4
XB4 93 XB1
2G5
2K5
98 CO1C CO6C
2H5
99 CO1B CO6B

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CLASS B RELEASE TDR No. 00226 DATE 1-9-63

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

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APPLICATION	

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO / CONTRACT
DRAWN J. Bell DATE 12-27-62
CHECKED [illegible] 1-Jan-63
APPROVAL
APPROVAL Eldon C Hall 8 Jan 63
NASA APPROVAL 1-9-63
MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "H"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006519
SCALE NONE
WT
SHEET 1 OF 2

1006519 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

M

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
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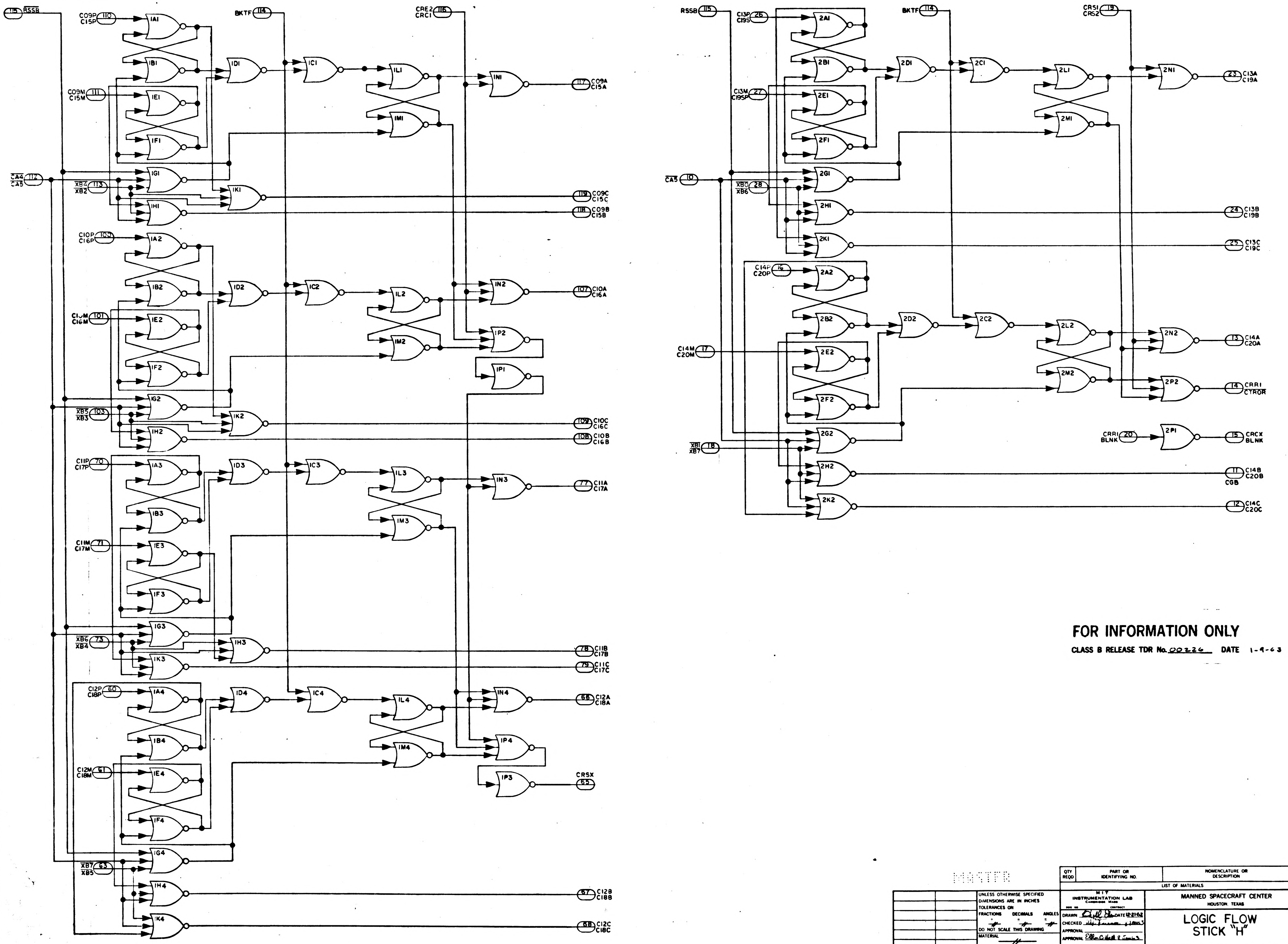
B	CHANGED PER TDRR 00521			WK.



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1F1
1M1
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XB4 XB2 113
1G1
1K1
1H1
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1B2
1D2
1C2
1L2
1N2
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1K2
1H2
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108 C10B C16B
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1B3
1D3
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1L3
1N3
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1F3
1M3
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79 C11C C17C
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1L4
1N4
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1E4
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68 C12C C18C
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2M1
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C14M C20M 17
2E2
2F2
2M2
2P2
14 CRR1 CTROR
CRR1 BLNK 20
2P1
15 CRCX BLNK
XB1 XB7 18
2G2
2H2
11 C14B C20B
CGB
2K2
12 C14C C20C

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CLASS B RELEASE TDR No. 00226 DATE 1-9-63

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LIST OF MATERIALS

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DWG NO CONTRACT
DRAWN DATE 12-21-62
CHECKED 3 JAN 63
APPROVAL
APPROVAL Ellen C Hall 8 Jan 63
NASA APPROVAL W J R 1-9-63
MIT APPROVAL 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "H"

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006519
SCALE NONE WT SHEET 2 OF 2

E 1006519 H

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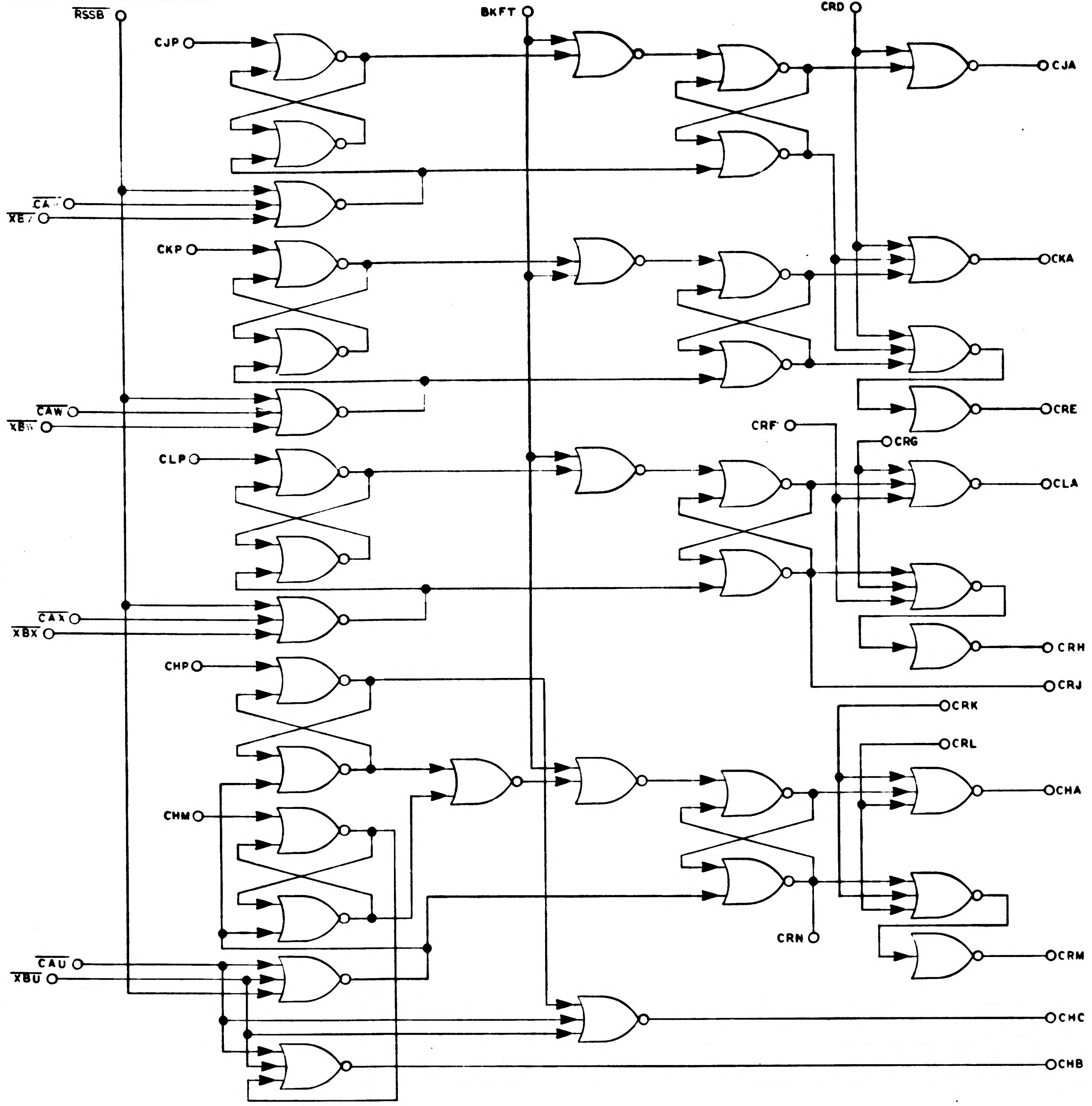
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



TERMINAL	DESTINATION STICK 1	DESTINATION STICK 2
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$\overline{CAR}$	$\overline{CA4}$	$\overline{CA5}$
$\overline{CAU}$	$\overline{CA3}$	$\overline{CA4}$
$\overline{CAV}$	$\overline{CA3}$	$\overline{CA4}$
$\overline{CAW}$	$\overline{CA3}$	$\overline{CA4}$
$\overline{CAX}$	$\overline{CA4}$	$\overline{CA3}$
$\overline{XBN}$	$\overline{XBOT4}$	$\overline{XBOT2}$
$\overline{XBM}$	$\overline{XBOT5}$	$\overline{XBOT3}$
$\overline{XBP}$	$\overline{XBOT6}$	$\overline{XBOT4}$
$\overline{XBR}$	$\overline{XBOT7}$	$\overline{XBOT5}$
$\overline{XBS}$	$\overline{XBOT0}$	$\overline{XBOT6}$
$\overline{XBT}$	$\overline{XBOTT}$	$\overline{XBOT7}$
$\overline{XBU}$	$\overline{XBOT4}$	$\overline{XBOTT}$
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CBM	C9M	C15M
CBA	C9A	C15A
CBB	C9B	C15B
CBC	N/C	C15C
CCP	C10P	C16P
CCM	C10M	C16M
CCA	C10A	C16A
CCB	C10B	C16B
CCC	C10C	C16C
CDP	C11P	C17P
CDM	C11M	C17M
CDA	C11A	C17A
CDB	C11B	C17B
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CGB	C14B	C20B
CGC	C14C	C20C
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CHB	C1B	C6B
CHC	C1C	C6C
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CJA	C3A	C7A
CKP	C4P	C8P
CKA	C4A	C8A
CLP	C5P	C2P
CLA	C5A	C2A
CRA	2-CRE	1-CRC
CRB	1-CRR	N/C
CRC	2-CRA	N/C
CRD	2-CRH	2-CRM
CRE	1-CRF/2-CRL	1-CRA
CRF	1-CRE/2 CRL	1-CRN
CRG	N/C	1CTRS
CRH	N/C	1-CRD
CRJ	2-CRK	N/C
CRK	1CTRS	1-CRJ
CRL	N/C	1-CRE/1-CRF
CRM	N/C	2-CRD
CRN	2-CRF	N/C
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$\overline{RSSB}$	$\overline{RSSB}$	$\overline{RSSB}$
BKTF	BKTF	BKTF

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CLASS B RELEASE TDR No. 00226 DATE 1-9-63

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LIST OF MATERIALS

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INSTRUMENTATION LAB
Cambridge Mass
DWG NO CONTRACT
DRAWN T. Bell DATE 12-27-62
CHECKED D. Turner 1-4-63
APPROVAL
APPROVAL Eldon C Hall 3 Jan 63
NASA APPROVAL W J Rhine 1-9-63
MIT APPROVAL W Kupfer 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

LOGIC FLOW STICK "H"

CODE IDENT NO | SIZE E | NASA DRAWING NO 1006519
SCALE NONE | WT | SHEET 1 OF 2

1006519

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

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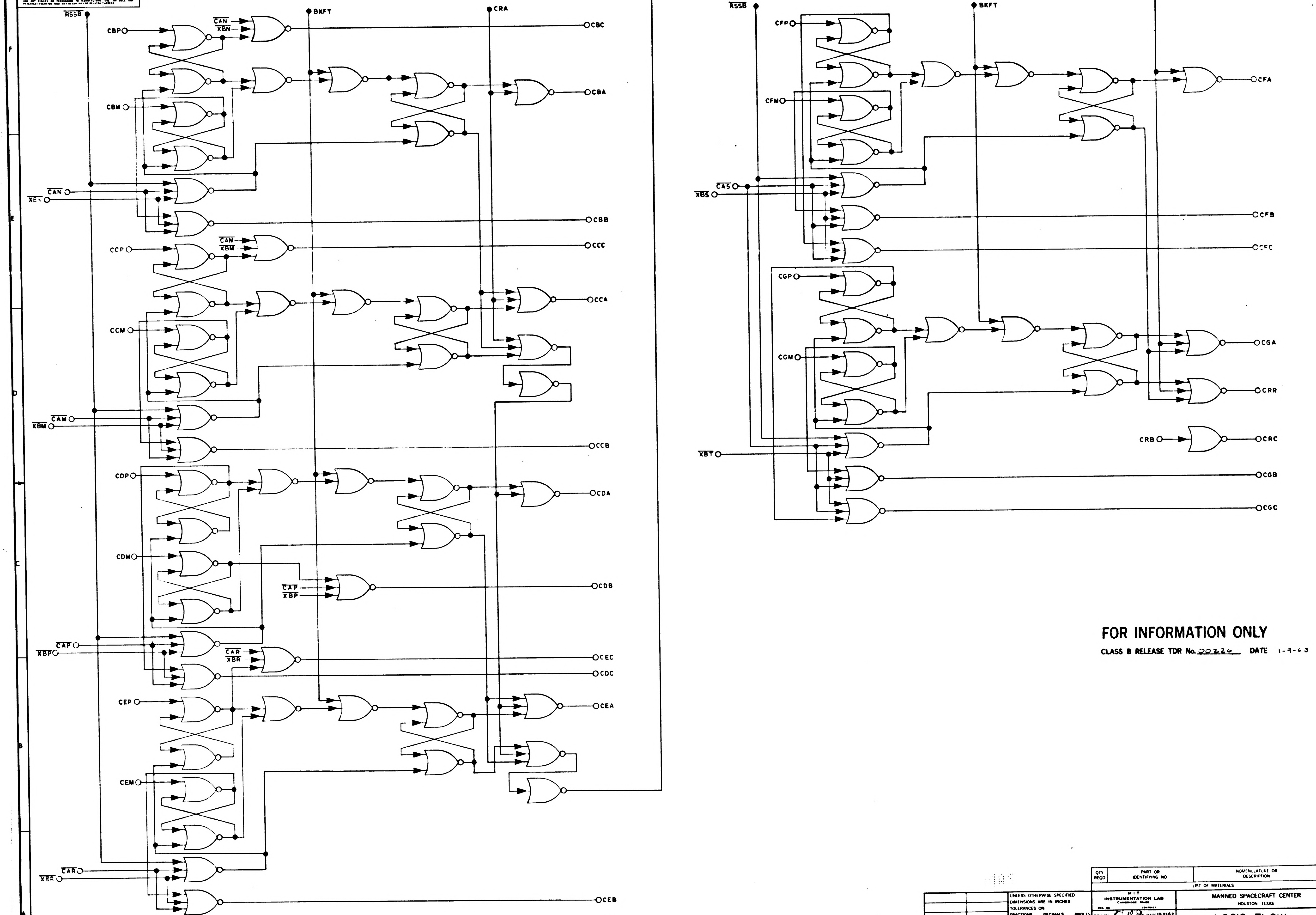
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CCB
CDP
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CAR
XBR
CEC
CDC
CEP
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CAR
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CEB
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BKFT
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CFM
CAS
XBS
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CFC
CGP
CGM
CGA
CRR
CRB
CRC
XBT
CGB
CGC

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DWG NO CONTRACT
DRAWN [illegible] DATE 12-21-62
CHECKED [illegible] 2 JAN 63
APPROVAL
APPROVAL Ellen C Hall 2 Jan 63
NASA APPROVAL [illegible] 1-9-63
MIT APPROVAL [illegible] 9 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

LOGIC FLOW
STICK "H"

CODE IDENT NO
SIZE E
NASA DRAWING NO 1006519
SCALE NONE WT SHEET 2 OF 2

1006519

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN WITH CHANGES PER TDRR 04170	10-24-63	
C	REVISED PER TDRR 04520	11-6-63	WK

REF DESIGNATION	PART NO.	DESCRIPTION	VALUE	TOL	RATING
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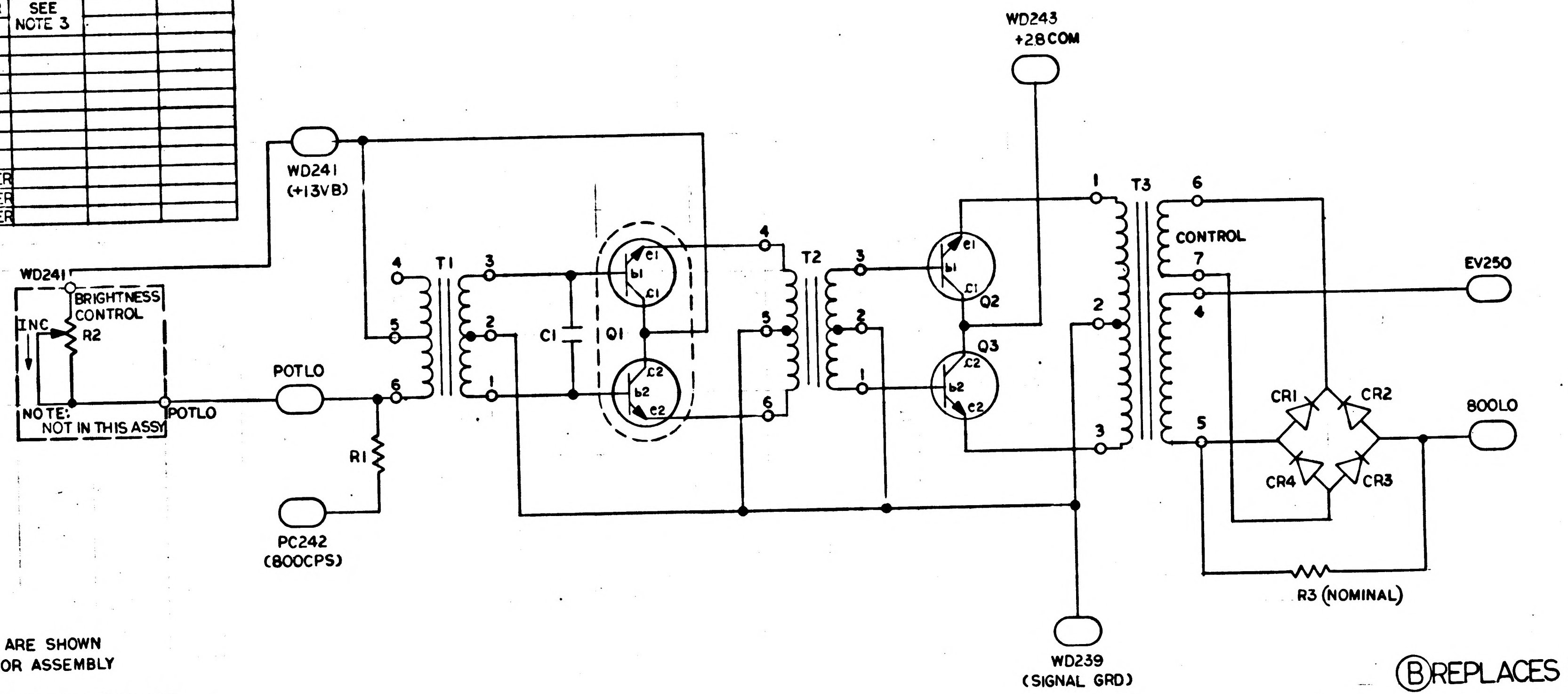
R2	1006736	NOT ON THIS ASSY			
R3	1006750	RESISTOR	SEE TABLE	2%	1/4W
C1	1006793-19	CAPACITOR	.0033		50V
Q1	1010376-1	TRANSISTOR			
Q2	1010269-2	TRANSISTOR	SEE NOTE 3		
Q3	1010269-2	TRANSISTOR			
CR1	1006751	DIODE			
CR2	1006751	DIODE			
CR3	1006751	DIODE			
CR4	1006751	DIODE			
T1	1010291-4	TRANSFORMER			
T2	1010291-4	TRANSFORMER			
T3	1006726	TRANSFORMER			



Ⓑ REPLACES REV A WITH CHANGES

NOTES
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN PREFIX THEM WITH UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. Q2 AND Q3 ARE MATCHED PAIRS

REFERENCE
1 ASSEMBLY DRAWING NO. 1003532

R3	DASH NO.	VALUE
1006750	-19	300
	-22	390
	-25	510
	-27	620
	-28	680
	-29	750
	-30	820
	-31	910
	-32	1000
	-34	1200
	-36	1500

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN B Jensen DATE 18OCT63
CHECKED 11 Oct 63
APPROVAL
APPROVAL 23 Oct 63
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 24 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC
POWER SUPPLY ASSEMBLY
AGC DSKY NAV & MAIN

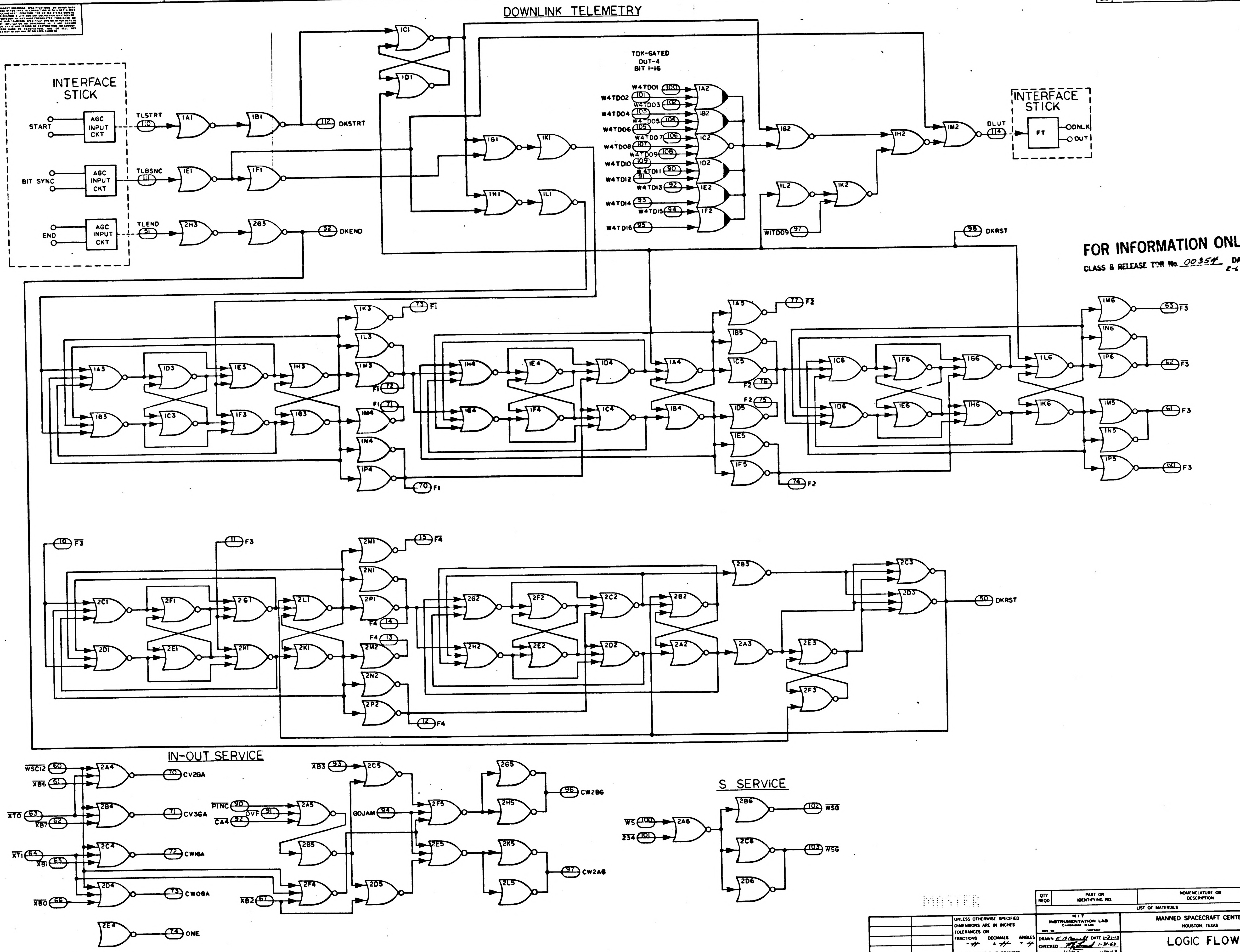
CODE IDENT NO. ——
SIZE D
NASA DRAWING NO. 1006163
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006163 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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INTERFACE STICK
START
BIT SYNC
END
AGC INPUT CKT
TLSTRT 110
TLBSNC 111
TLEND 51
1A1
1B1
112 DKSTRT
1E1
1F1
2H3
2G3
52 DKEND
1C1
1D1
1G1
1K1
1M1
1L1
TDK-GATED
OUT-4
BIT 1-16
W4TD01 100
W4TD02 101
W4TD03 102
W4TD04 103
W4TD05 104
W4TD06 105
W4TD07 106
W4TD08 107
W4TD09 108
W4TD10 109
W4TD11 90
W4TD12 91
W4TD13 92
W4TD14 93
W4TD15 94
W4TD16 95
1A2
1B2
1C2
1D2
1E2
1F2
1G2
1H2
1L2
1K2
W1TD09 97
1M2
DLUT 114
INTERFACE STICK
FT
DNLK
OUT
98 DKRST
1A3
1D3
1E3
1H3
1B3
1C3
1F3
1G3
1K3
73 F1
1L3
1M3
F1 72
F1 71
1M4
1N4
1P4
70 F1
1H4
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1D4
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1C4
1A4
1B4
1A5
77 F2
1B5
1C5
F2 76
F2 75
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1E5
1F5
74 F2
1C6
1F6
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1N6
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1N5
1P5
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2C1
2F1
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2L1
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2E1
2H1
2K1
2M1
15 F4
2N1
2P1
F4 14
F4 13
2M2
2N2
2P2
12 F4
2G2
2F2
2C2
2B2
2H2
2E2
2D2
2A2
2B3
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2E3
2F3
2C3
2D3
50 DKRST
IN-OUT SERVICE
WSC12 60
XB6 61
XT0 63
XB7 62
XT1 64
XB1 65
XB0 66
2A4
70 CV2GA
2B4
71 CV3GA
2C4
72 CW1GA
2D4
73 CW0GA
2E4
74 ONE
PINC 90
OVF 91
CA4 92
2A5
2B5
XB3 93
2C5
GOJAM 94
XB2 67
2F4
2D5
2F5
2E5
2G5
2H5
96 CW2B6
2K5
2L5
97 CW2A6
S SERVICE
WS 100
234 101
2A6
2B6
2C6
2D6
102 W5G
103 W5G

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00354 DATE 2-6-63

E 1006522

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± // DECIMALS ± // ANGLES ± //
DO NOT SCALE THIS DRAWING
MATERIAL //
HEAT TREATMENT //
FINAL FINISH //

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN E O Connell DATE 1-21-63
CHECKED W Ford 1-31-63
APPROVAL W E Turner 1 Feb 63
APPROVAL Eldon C Hall 4 Feb 63
NASA APPROVAL William J Lang 6 Feb 63
MIT APPROVAL W Kupfer 6 Feb 63

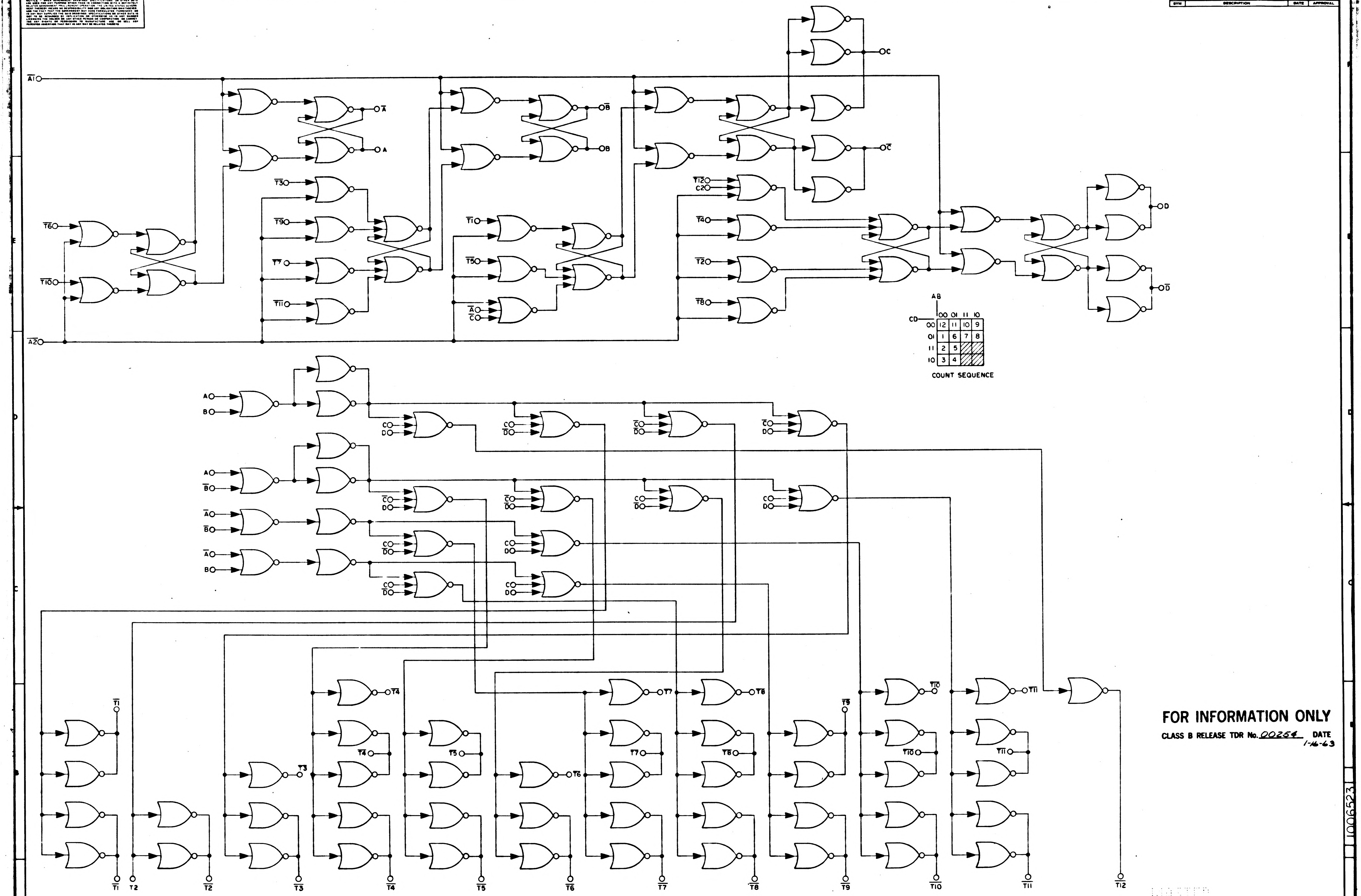
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK M

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006522
SCALE | WT | SHEET OF

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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$\overline{T5}$
$\overline{A}$
A
C
$\overline{T12}$
C2
$\overline{T4}$
$\overline{T2}$
$\overline{T8}$
$\overline{A}$
A
$\overline{B}$
B
$\overline{C}$
C
D
$\overline{D}$
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$\overline{T4}$
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T9
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$\overline{T11}$
T12

CD \ AB	00	01	11	10
00	12	11	10	9
01	1	6	7	8
11	2	5	▨	▨
10	3	4	▨	▨

COUNT SEQUENCE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00254 DATE 1-16-63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARS PERSCRIBED BY MIL-D-70327

TIME PULSE GENERATOR
IT COUNTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN Mahoney DATE 1-9-63
CHECKED Joe Martin 1-15-63
APPROVAL W. Turner 15 Jan 63
APPROVAL Eldon C Hall 15 Jan 63
NASA APPROVAL 1/16/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

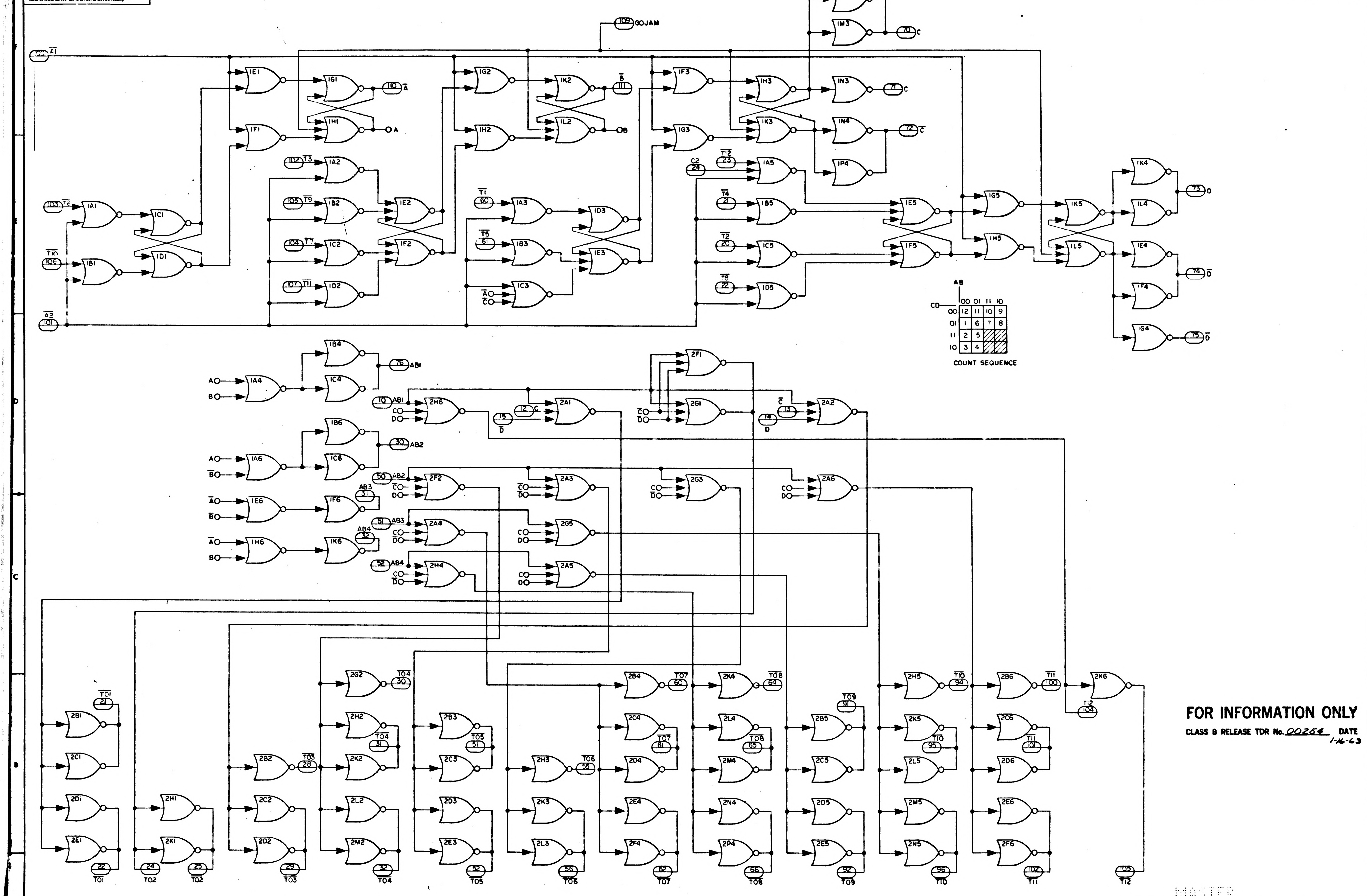
LOGIC FLOW
STICK J

CODE IDENT NO
SIZE E
NASA DRAWING NO 1006523
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00311	1-28-63	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103 $\overline{T6}$
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1G2
1H2
1K2
1L2
111 $\overline{B}$
B
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1K3
1L3
1M3
1N3
1N4
1P4
70 C
71 C
72 $\overline{C}$
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1B1
1C1
1D1
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$\overline{C}$
24 C2
23 $\overline{T12}$
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20 $\overline{T2}$
22 $\overline{T8}$
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1D5
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1K5
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1F4
1G4
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75 $\overline{D}$
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1B4
1C4
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1B6
1C6
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1E6
1F6
31 AB3
1H6
1K6
32 AB4
10 AB1
50 AB2
51 AB3
52 AB4
2H6
2F2
2A4
2H4
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15 $\overline{D}$
13 $\overline{C}$
14 D
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2F1
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2D1
2E1
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2K1
24 T02
25 $\overline{T02}$
2B2
2C2
2D2
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2L2
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2L4
2M4
2N4
2P4
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2N5
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2B6
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2E6
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100 $\overline{T11}$
101 $\overline{T11}$
102 $\overline{T11}$
2K6
104 T12
105 T12

CD \ AB	00	01	11	10
00	12	11	10	9
01	1	6	7	8
11	2	5	▨	▨
10	3	4	▨	▨

COUNT SEQUENCE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00254 DATE 1-16-63

1006523 A

MASTER

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PERSCRIBED BY MIL-D-70327

TIME PULSE GENERATOR
IT COUNTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT

DRAWN Mahoney DATE 1-9-63
CHECKED Joe Martin 1-15-63
APPROVAL W. Turner 15 Jan 63
APPROVAL Eldon C Hall 15 Jan 63
NASA APPROVAL 4/6/63
MIT APPROVAL

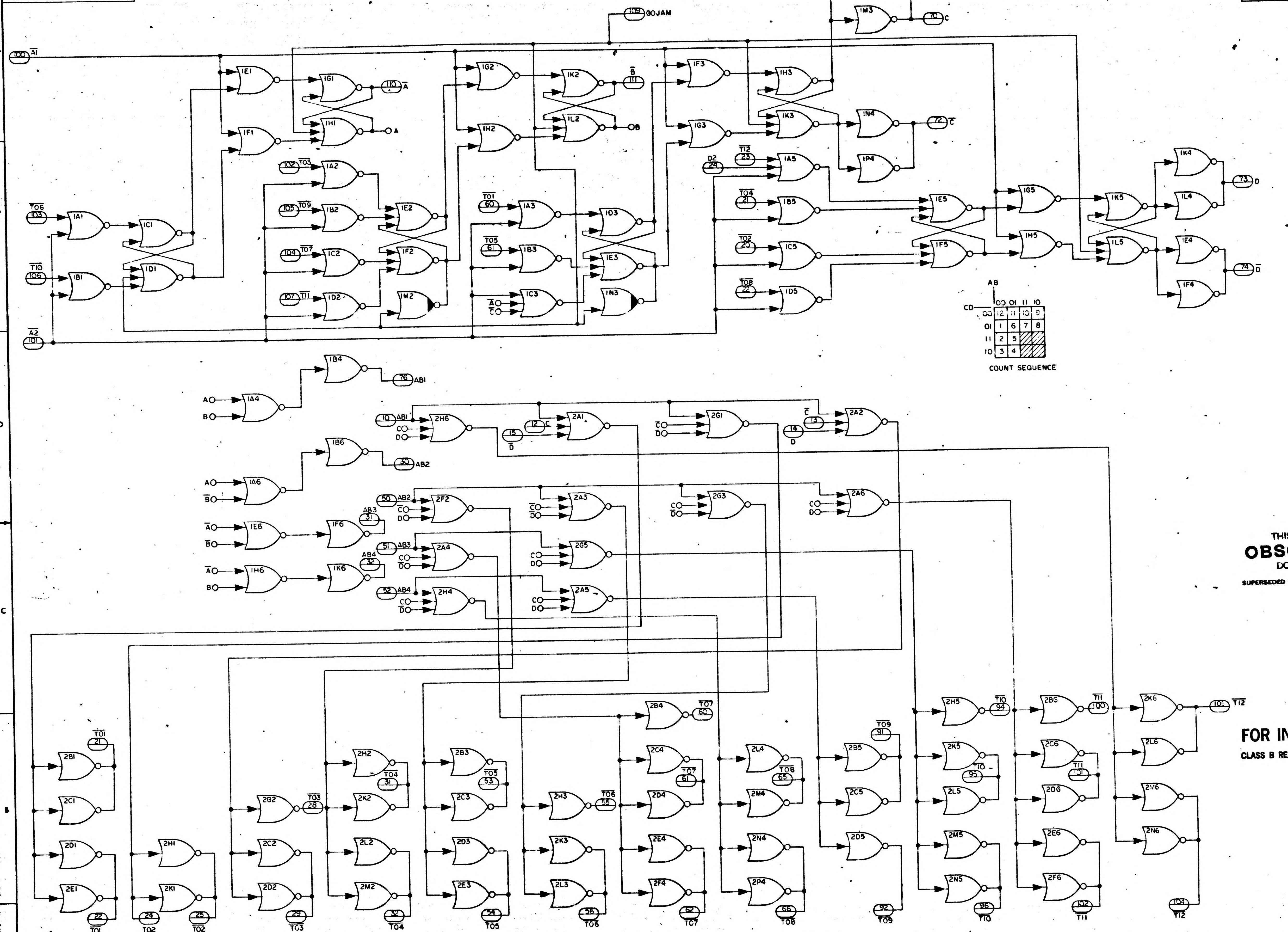
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK J

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006523
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED PER TDRR 00311	1-28-63	ECH	WK
B	REVISED PER TDRR 00527	3-4-63	ECH	WK
C	REVISED PER TDRR 00914		ECH	WK
D	OBSOLETED PER TDRR 03140	9-18-63		WK



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1H1
110 Ā
A
1G2
1H2
1K2
1L2
111 B̄
B
1F3
1G3
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1K3
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1P4
72 C̄
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105 T09
104 T07
107 T11
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1M2
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1B1
1C1
1D1
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A2 101
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T05 61
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1C3
1D3
1E3
1N3
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T02 25
T08 26
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1K5
1L5
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1L4
1E4
1F4
73 D
74 D̄
1A4
1B4
79 AB1
1A6
1B6
30 AB2
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1F6
AB3 31
1H6
1K6
AB4 32
10 AB1
2H6
15 D̄
12 C
2A1
2G1
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13 C̄
2A2
50 AB2
2F2
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51 AB3
2A4
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T01 21
22 T01
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2K1
24 T02
25 T02
2B2
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T03 28
29 T03
2H2
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2L2
2M2
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2D3
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2L6
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103 T12
104 T12

CD \ AB	00	01	11	10
00	12	11	10	9
01	1	6	7	8
11	2	5	▨	▨
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COUNT SEQUENCE

THIS DRAWING
OBSOLETE
DO NOT USE
SUPERSEDED BY 1006549

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00254 DATE 1-16-63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PERSCRIBED BY MIL-D-70327

TIME PULSE GENERATOR
IT COUNTER

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT
DRAWN Mahoney DATE 1-9-63
CHECKED Joe Martin 1-15-63
APPROVAL W E Lucas 11 JAN 63
APPROVAL Eldon C Hall 15 Jan 63
NASA APPROVAL 4/16/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

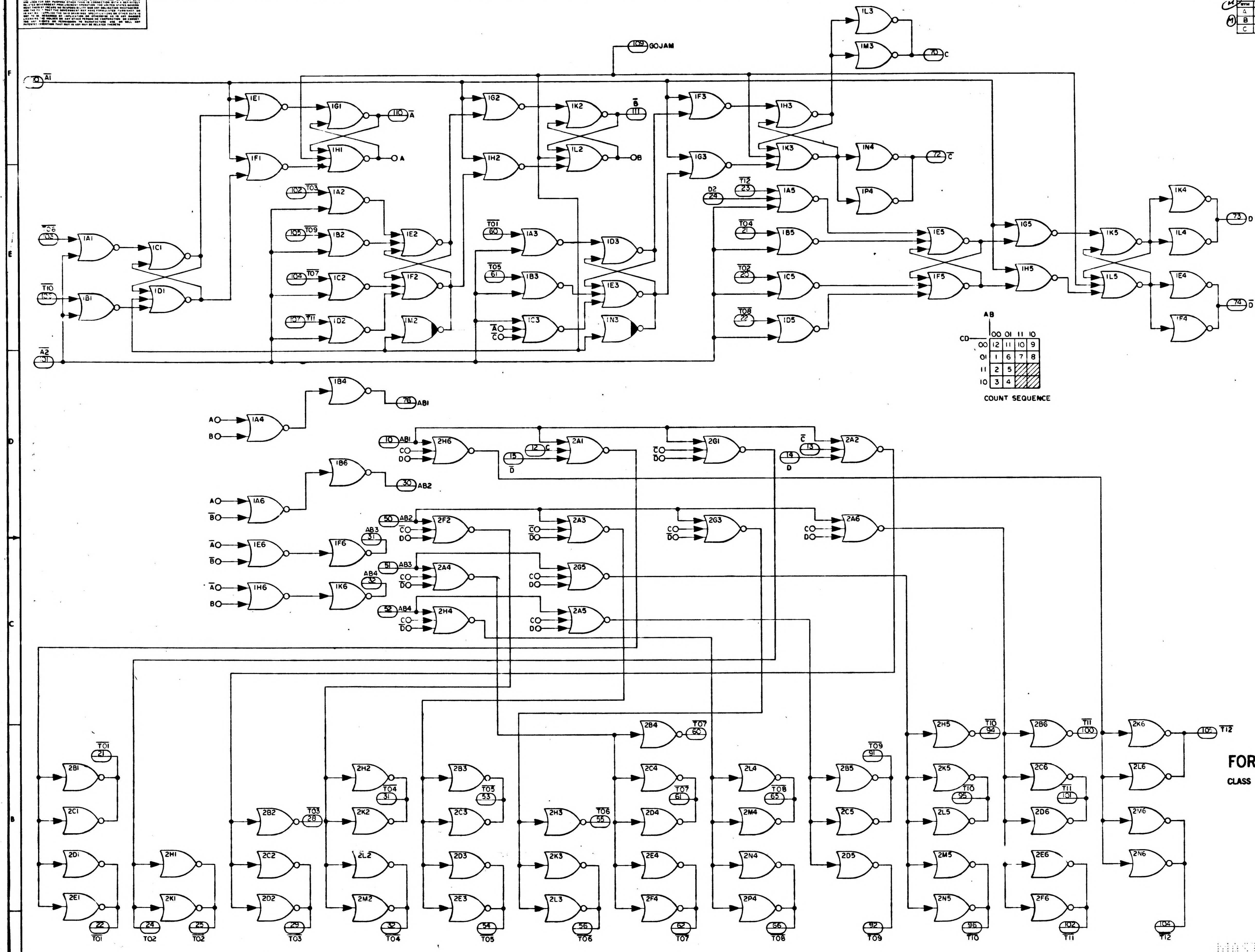
LOGIC FLOW
STICK J

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006523
SCALE
WT
SHEET 1 OF 1

1006523 D

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00311	2-28-63	ECH
B	REVISED PER TDRR 00527	3-4-63	ECH
C	REVISED PER TDRR 00914		ECH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52 AB4
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13 C
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15 D
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T10 95
T10 96
T11 100
T11 101
T11 102
T12 105
T12 104
T03 102
T09 105
T07 104
T11 107
T01 60
T05 61
T12 23
D2 24
T04 21
T02 20
T08 22

CD \ AB	00	01	11	10
00	12	11	10	9
01	1	6	7	8
11	2	5	▨	▨
10	3	4	▨	▨

COUNT SEQUENCE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00264 DATE 1-16-63

1006523 C

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PERSCRIBED BY MIL-D-70327

TIME PULSE GENERATOR

IT COUNTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
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MATERIAL —
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DRAWN Mahoney DATE 1-9-63
CHECKED J. Martin 1-15-63
APPROVAL 15 Jan 63
APPROVAL Eldon C Hall 15 Jan 63
NASA APPROVAL 4/1/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK J

CODE IDENT NO | SIZE E | NASA DRAWING NO 1006523
SCALE — | WT | SHEET 1 OF 1

INCHES
PHOTOGRAPHIC SCALE ONLY

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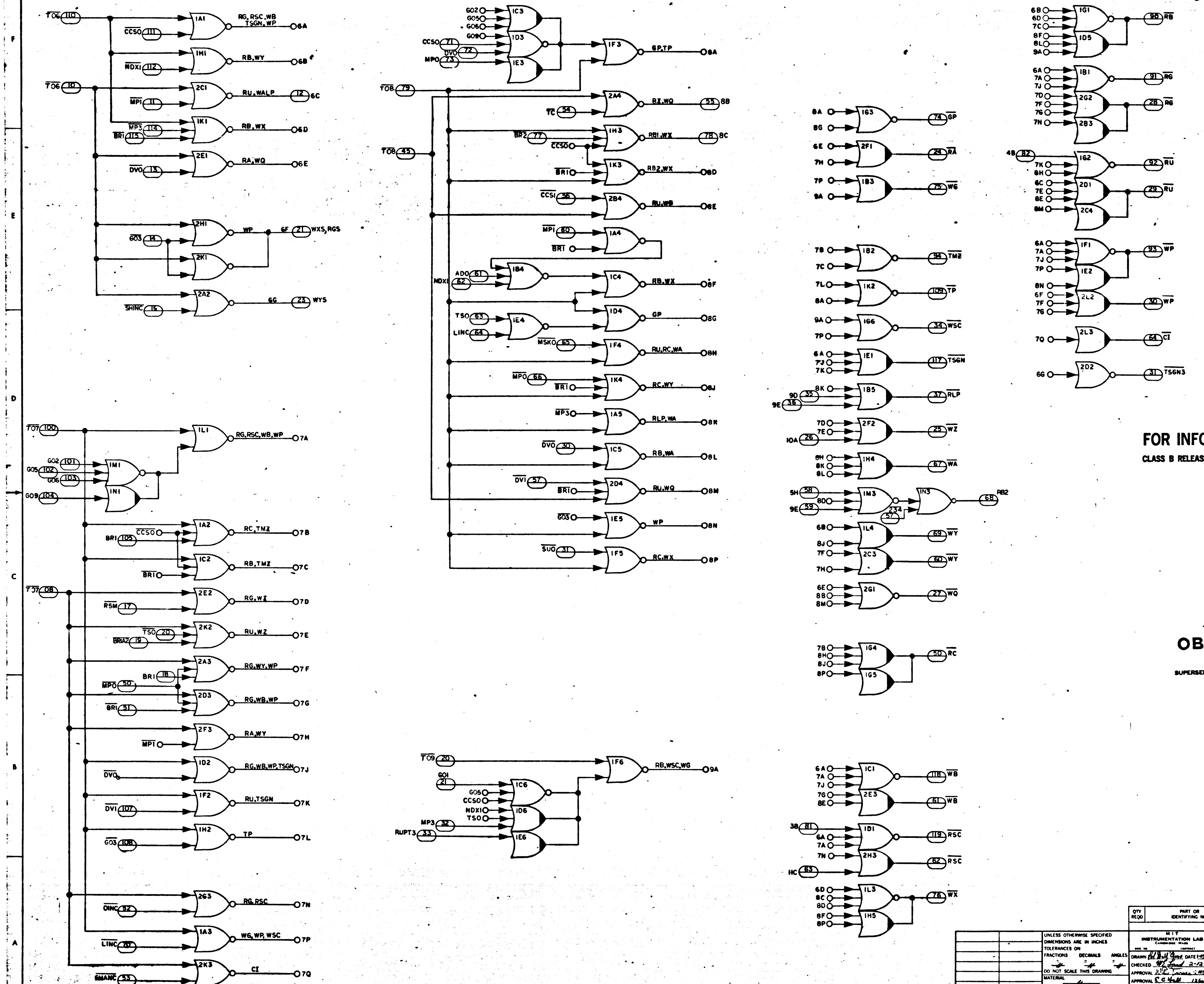
CONTROL PULSE 2

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED PER TDRR 00517	3-6-63		WK
B	REVISED PER TDRR 00936	4-26-63	CGH	WK
C	OBSOLETED PER TDRR 03146	9-13-63		WK



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$\overline{CCSO}$ 111
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RG, RSC, WB TSGN, WP
6A
1H1
$\overline{NDXI}$ 112
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6B
$\overline{T06}$ 10
2C1
$\overline{MPI}$ 11
RU, WALP
12 6C
1K1
$\overline{MP3}$ 114
$\overline{BRI}$ 115
RB, WX
6D
2E1
$\overline{DVO}$ 13
RA, WQ
6E
2H1
$\overline{G03}$ 14
WP
6F 21 WXS, RGS
2K1
2A2
$\overline{SHINC}$ 15
6G 23 WYS
$\overline{T07}$ 100
1L1
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7A
G02 101
G05 102
G06 103
G09 104
1M1
1N1
1A2
$\overline{CCSO}$
BRI 105
RC, TMZ
7B
1C2
$\overline{BRI}$
RB, TMZ
7C
$\overline{T07}$ 08
2E2
$\overline{RSM}$ 17
RG, WZ
7D
2K2
$\overline{TSO}$ 20
$\overline{BRIA2}$ 19
RU, WZ
7E
2A3
BRI 18
RG, WY, WP
7F
$\overline{MPO}$ 50
2D3
$\overline{BRI}$ 51
RG, WB, WP
7G
2F3
$\overline{MPI}$
RA, WY
7H
1D2
$\overline{DVO}$
RG, WB, WP, TSGN
7J
1F2
$\overline{DVI}$ 107
RU, TSGN
7K
1H2
$\overline{G03}$ 108
TP
7L
2G3
$\overline{OINC}$ 52
RG, RSC
7N
1A3
$\overline{LINC}$ 70
WG, WP, WSC
7P
2K3
$\overline{SMANC}$ 53
CI
7Q
G02
G05
G06
G09
1C3
1D3
1E3
CCSO 71
DVO 72
MPO 73
1F3
GP, TP
8A
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$\overline{TC}$ 54
RZ, WQ
55 8B
1H3
$\overline{BR2}$ 77
$\overline{CCSO}$
RB1, WX
78 8C
$\overline{T08}$ 45
1K3
$\overline{BRI}$
RB2, WX
8D
2B4
$\overline{CCSI}$ 56
RU, WB
8E
1A4
$\overline{MPI}$ 60
$\overline{BRI}$
1B4
ADO 61
NDXI 62
1C4
RB, WX
8F
1D4
GP
8G
1E4
TSO 63
LINC 64
1F4
$\overline{MSKO}$ 65
RU, RC, WA
8H
1K4
$\overline{MPO}$ 66
$\overline{BRI}$
RC, WY
8J
1A5
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RLP, WA
8K
1C5
$\overline{DVO}$ 30
RB, WA
8L
2D4
$\overline{DVI}$ 57
$\overline{BRI}$
RU, WQ
8M
1E5
$\overline{G03}$
WP
8N
1F5
$\overline{SUO}$ 31
RC, WX
8P
$\overline{T09}$ 20
1F6
RB, WSC, WG
9A
G01 21
G05
CCSO
NDXI
TSO
1C6
1D6
1E6
MP3 32
RUPT3 33
8A
8G
1G3
74 $\overline{GP}$
6E
7H
2F1
24 $\overline{RA}$
7P
9A
1B3
75 $\overline{WG}$
7B
7C
1B2
94 $\overline{TMZ}$
7L
8A
1K2
109 $\overline{TP}$
9A
7P
1G6
34 $\overline{WSC}$
6A
7J
7K
1E1
117 $\overline{TSGN}$
8K
9D 35
9E 36
1B5
37 $\overline{RLP}$
7D
7E
10A 26
2F2
25 $\overline{WZ}$
8H
8K
8L
1H4
67 $\overline{WA}$
5H 58
8D
9E 59
1M3
1N3
234
57
68 RB2
6B
8J
1L4
69 $\overline{WY}$
7F
7H
2C3
60 $\overline{WY}$
6E
8B
8M
2G1
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7B
8H
8J
8P
1G4
1G5
50 $\overline{RC}$
6A
7A
7J
1C1
118 $\overline{WB}$
7G
8E
2E3
61 $\overline{WB}$
3B 81
6A
7A
1D1
119 $\overline{RSC}$
7N
HC 63
2H3
62 $\overline{RSC}$
6D
8C
8D
8F
8P
1L3
1H5
76 $\overline{WX}$
6B
6D
7C
8F
8L
9A
1G1
1D5
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7A
7J
7D
7F
7G
7N
1B1
91 $\overline{RG}$
2G2
2B3
28 $\overline{RG}$
4B 82
7K
8H
6C
7E
8E
8M
1G2
92 $\overline{RU}$
2D1
2C4
29 $\overline{RU}$
6A
7A
7J
7P
8N
6F
7F
7G
1F1
1E2
93 $\overline{WP}$
2L2
30 $\overline{WP}$
7Q
2L3
64 $\overline{CI}$
6G
2D2
31 $\overline{TSGN3}$

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CLASS B RELEASE TDR No. 00391 DATE 13Feb63

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LIST OF MATERIALS

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CHECKED 2-12-63
APPROVAL 12Feb63
APPROVAL E C Hall 13Feb63
NASA APPROVAL 2-7-63
MIT APPROVAL

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HOUSTON, TEXAS

LOGIC FLOW
STICK "P"

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006524
SCALE — WT SHEET 1 OF 1

1006524

INCHES
0 1 2
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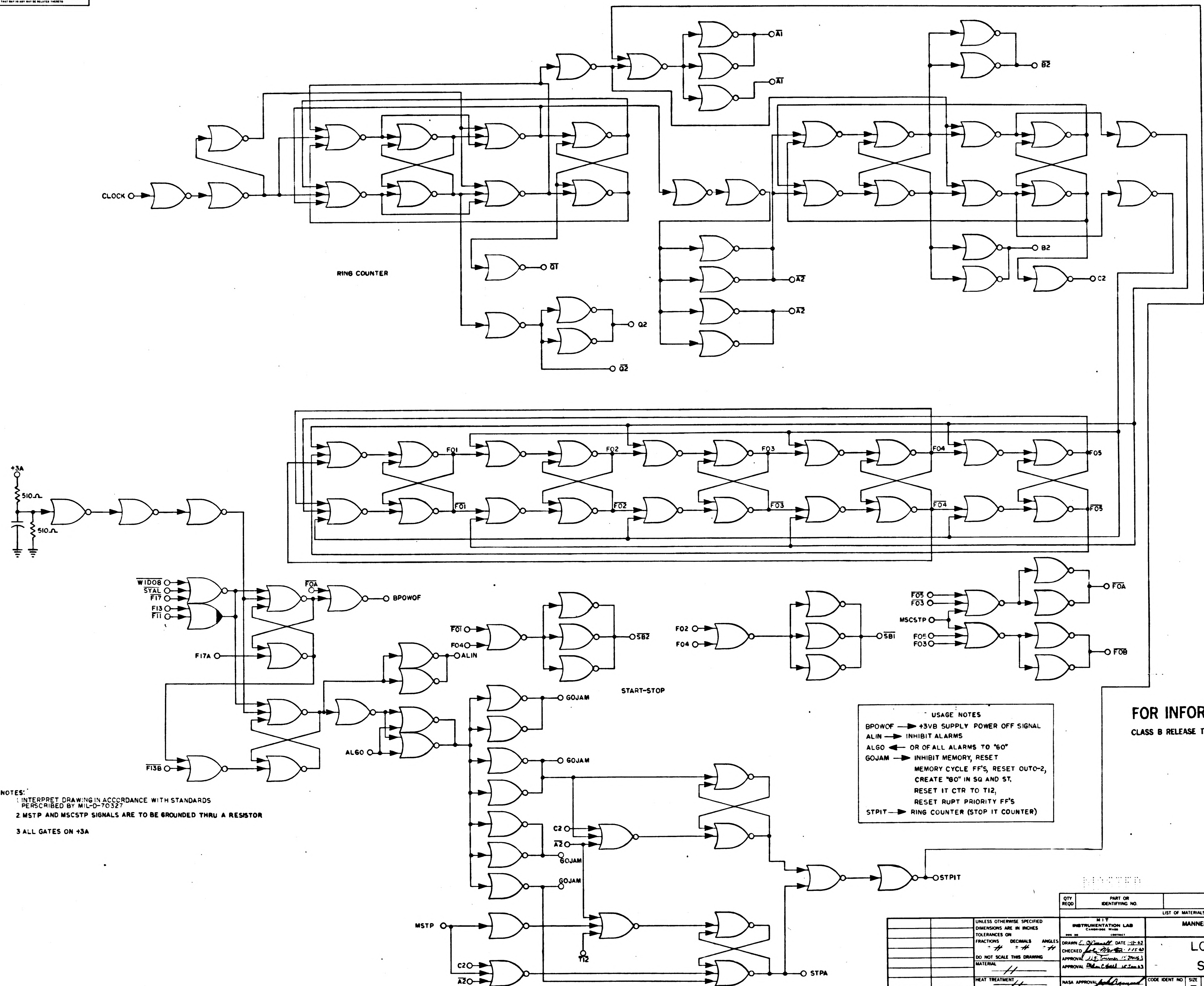
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



CLOCK
RING COUNTER
$\overline{Q1}$
Q2
$\overline{Q2}$
$\overline{A1}$
$\overline{A1}$
$\overline{B2}$
B2
$\overline{A2}$
$\overline{A2}$
C2
+3A
510Ω
510Ω
F01
$\overline{F01}$
F02
$\overline{F02}$
F03
$\overline{F03}$
F04
$\overline{F04}$
F05
$\overline{F05}$
$\overline{WIDO8}$
$\overline{SYAL}$
F17
F13
$\overline{F11}$
$\overline{F0A}$
BPOWOF
F17A
$\overline{F01}$
F04
ALIN
$\overline{SB2}$
F02
F04
$\overline{SB1}$
$\overline{F05}$
F03
MSCSTP
F05
F03
$\overline{F0A}$
$\overline{F0B}$
START-STOP
GOJAM
AL60
GOJAM
$\overline{F13B}$
C2
$\overline{A2}$
GOJAM
GOJAM
T12
MSTP
C2
$\overline{A2}$
STPIT
STPA

USAGE NOTES

BPOWOF → +3VB SUPPLY POWER OFF SIGNAL
ALIN → INHIBIT ALARMS
ALGO ← OR OF ALL ALARMS TO "60"
GOJAM → INHIBIT MEMORY, RESET
MEMORY CYCLE FF'S, RESET OUTO-2,
CREATE "60" IN SQ AND ST,
RESET IT CTR TO T12,
RESET RUPT PRIORITY FF'S
STPIT → RING COUNTER (STOP IT COUNTER)

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PERSCRIBED BY MIL-D-70327
2. MSTP AND MSCSTP SIGNALS ARE TO BE GROUNDED THRU A RESISTOR
3. ALL GATES ON +3A

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LIST OF MATERIALS

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DRAWN E. O'Connell DATE 1-11-63
CHECKED [illegible] 1-15-63
APPROVAL [illegible] 15 JAN 63
APPROVAL [illegible] 15 Jan 63
NASA APPROVAL [illegible] 1/16/63
MIT APPROVAL [illegible]

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HOUSTON, TEXAS

LOGIC FLOW
STICK "N"

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006525
SCALE
WT
SHEET 1 OF 1

1006525

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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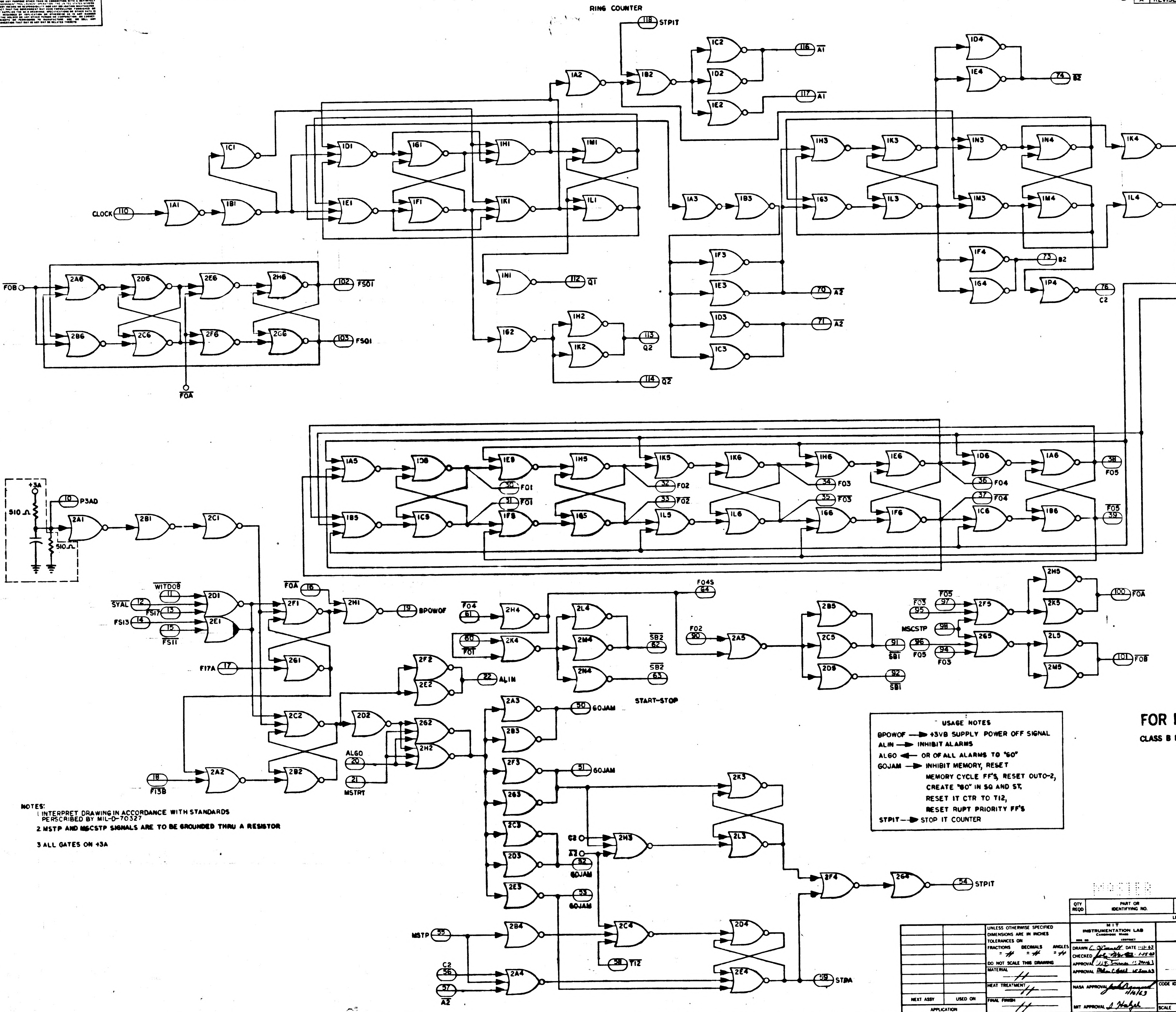
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CLOCK 110
1A1
1B1
1C1
1D1
1E1
1G1
1F1
1H1
1K1
1M1
1L1
1A2
1B2
1C2
1D2
1E2
116 A1
117 A1
1N1
112 Q1
1G2
1H2
1K2
113 Q2
114 Q2
1A3
1B3
1F3
1E3
1D3
1C3
70 A2
71 A2
1H3
1G3
1K3
1L3
1N3
1M3
1N4
1M4
1K4
1L4
1D4
1E4
74 B2
1F4
1G4
73 B2
1P4
76 C2
FOB
2A6
2B6
2D6
2C6
2E6
2F6
2H6
2G6
102 FS01
103 FS01
FOA
1A5
1B5
1D5
1C5
1E5
1F5
1H5
1G5
1K5
1L5
1K6
1L6
1H6
1G6
1E6
1F6
1D6
1C6
1A6
1B6
30 F01
31 F01
32 F02
33 F02
34 F03
35 F03
36 F04
37 F04
38 F05
F05 39
+3A
10 P3AD
510 Ω
510 Ω
2A1
2B1
2C1
WITD08
SYAL 12
11
FS17 13
FS13 14
15
FS11
2D1
2E1
FOA 16
2F1
2G1
2H1
19 BPOWOF
F17A 17
2F2
2E2
22 ALIN
2C2
2B2
2D2
2G2
2H2
ALGO 20
21 MSTRT
18 F13B
2A2
F04 61
2H4
2K4
60
F01
F04S 64
2L4
2M4
2N4
SB2 62
SB2 63
F02 90
2A5
2B5
2C5
2D5
91 SB1
92 SB1
F03 95
F05 97
MSCSTP 98
96 F05
94 F03
2F5
2G5
2H5
2K5
2L5
2M5
100 FOA
101 FOB
START-STOP
2A3
2B3
50 GOJAM
2F3
51 GOJAM
2G3
2C3
2D3
2E3
C2
A2
2H3
52 GOJAM
53 GOJAM
2K3
2L3
2F4
2G4
54 STPIT
MSTP 55
2B4
C2 56
57 A2
2A4
2C4
58 T12
2D4
2E4
59 STBA

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PERSCRIBED BY MIL-D-70327
2. MSTP AND MSCSTP SIGNALS ARE TO BE GROUNDED THRU A RESISTOR
3. ALL GATES ON +3A

USAGE NOTES

BPOWOF ⟶ +3VB SUPPLY POWER OFF SIGNAL
ALIN ⟶ INHIBIT ALARMS
ALGO ⟵ OR OF ALL ALARMS TO "GO"
GOJAM ⟶ INHIBIT MEMORY, RESET MEMORY CYCLE FF'S, RESET OUTO-2, CREATE "GO" IN SQ AND ST, RESET IT CTR TO T12, RESET RUPT PRIORITY FF'S
STPIT ⟶ STOP IT COUNTER

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CLASS B RELEASE TDR No. 00844 DATE 1-16-63

MASTER

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LIST OF MATERIALS			

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FRACTIONS ± // DECIMALS ± // ANGLES ± //
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MATERIAL //
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DRAWN E. O'Connell DATE 1-11-63
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APPROVAL 16 Jan 63
NASA APPROVAL 1/16/63
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LOGIC FLOW STICK "N"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006525
SCALE
WT
SHEET 1 OF 1

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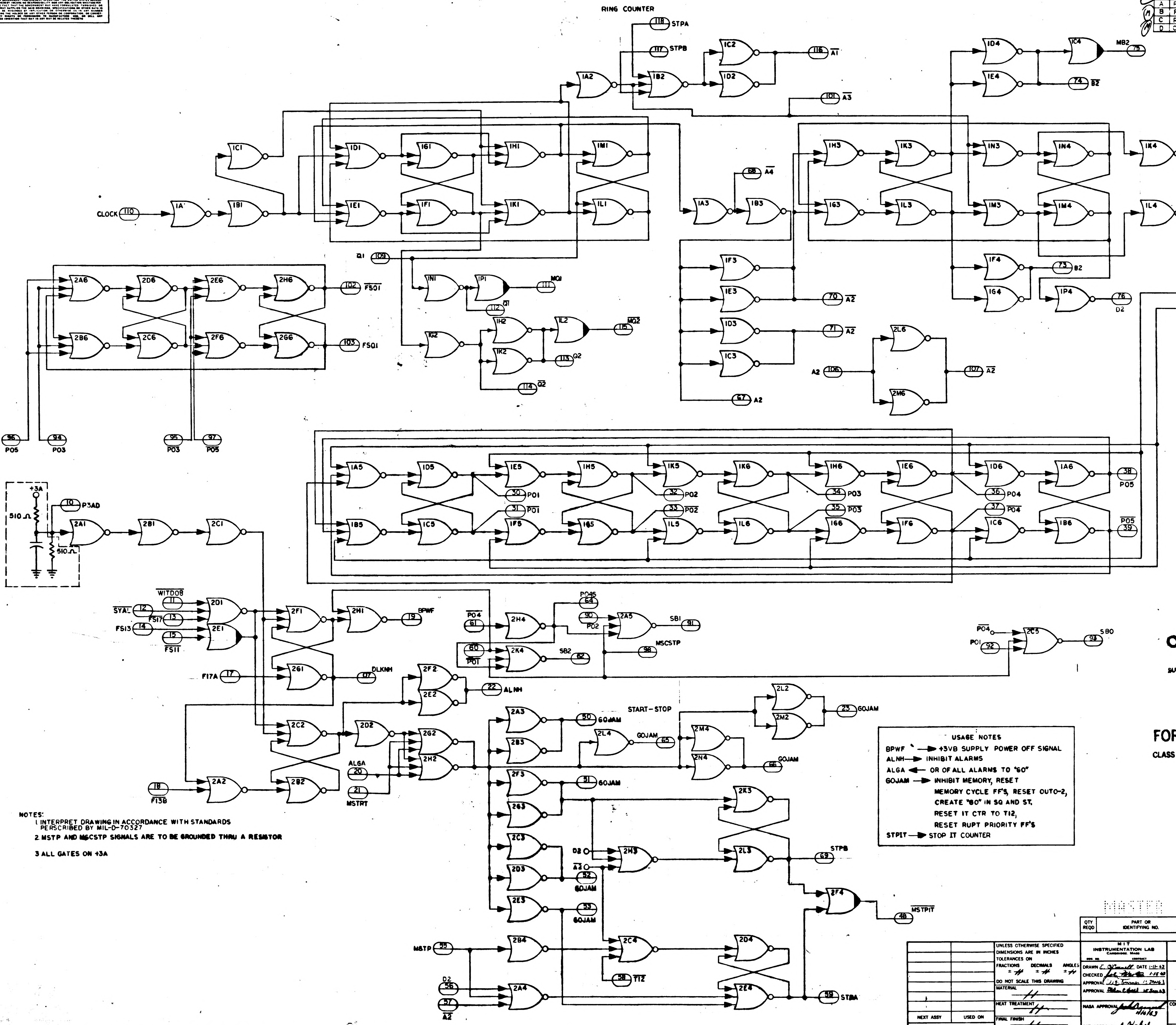
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED PER TDRR 00312	1-30-63	ECH	WK
B	REVISED PER TDRR 00529		ECH	WK
C	REVISED PER TDRR 01127	6-1-63	ECH	WK
D	OBSOLETED PER TDRR 03140			


RING COUNTER
STPA
STPB
A1
A3
MB2
B2
A4
A2
B2
D2
CLOCK 110
Q1 109
MQ1
Q1
MQ2
Q2
FS01
FSQ1
A2 106
P05
P03
P01
P02
P04
+3A
510 Ω
P3AD
WITD08
STAL
FS17
FS13
FS11
F17A
BPWF
DLKNH
ALNH
P045
SB1
MSCSTP
SB2
SB0
F13B
ALGA
MSTRT
START–STOP
GOJAM
STPB
D2
A3
T12
MSTP
STPIT
STPA

USAGE NOTES

BPWF → +3VB SUPPLY POWER OFF SIGNAL
ALNH → INHIBIT ALARMS
ALGA ← OR OF ALL ALARMS TO "60"
GOJAM → INHIBIT MEMORY, RESET MEMORY CYCLE FF'S, RESET OUTO-2, CREATE "60" IN SQ AND ST, RESET IT CTR TO T12, RESET RUPT PRIORITY FF'S
STPIT → STOP IT COUNTER

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PERSCRIBED BY MIL-D-70327
2. MSTP AND MSCSTP SIGNALS ARE TO BE GROUNDED THRU A RESISTOR
3. ALL GATES ON +3A

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± // DECIMALS ± // ANGLES ± //
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MATERIAL //
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DRAWN E. O'Connell DATE 1-11-63
CHECKED 1-15-63
APPROVAL 15 JAN 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

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HOUSTON, TEXAS

LOGIC FLOW
STICK "N"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006525
SCALE
WT
SHEET 1 OF 1

1006525 D

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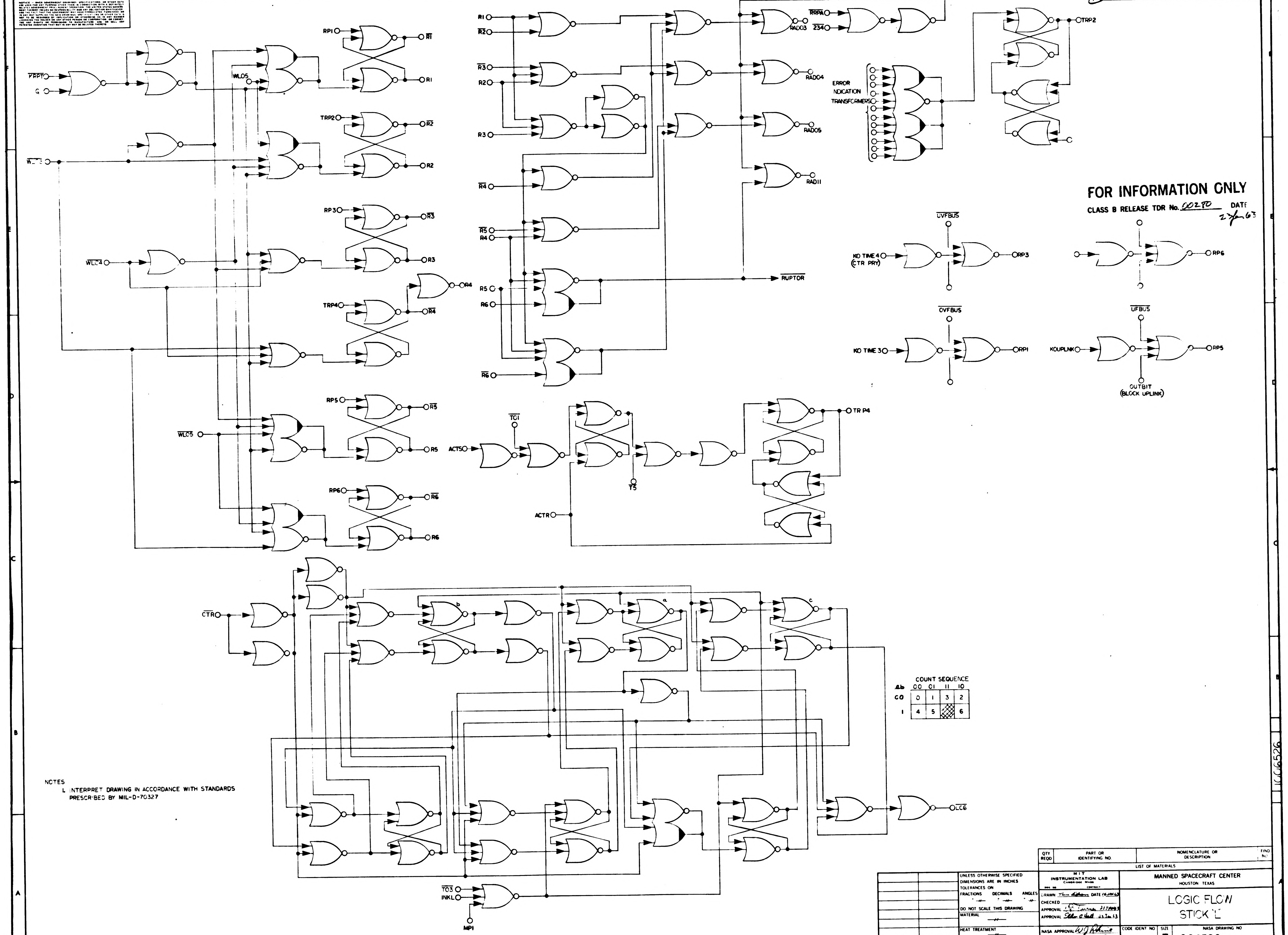
SYM	REVISIONS DESCRIPTION	DATE	APPROVAL


KRPT
G
WLO5
WLC3
WLC4
WLC5
RP1
R1
TRP2
R2
RP3
R3
R4
TRP4
RP5
R5
RP6
R6
RUPTOR
RADO3
RADO4
RADO5
RAD11
RRPA
234
ERROR
INDICATION
TRANSFORMERS
UVFBUS
KO TIME 4
(CTR PRY)
OVFBUS
KO TIME 3
UFBUS
KOUPLNK
OUTBIT
(BLOCK UPLINK)
TC1
ACTS
T5
ACTR
TR P4
CTR
b
a
c
LC6
TO3
INKL
MPI

COUNT SEQUENCE

ab c	00	01	11	10
0	0	1	3	2
1	4	5	▨	6

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CLASS B RELEASE TDR No. 00280 DATE 23 Jan 63

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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LIST OF MATERIALS

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APPLICATION	

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DIMENSIONS ARE IN INCHES
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MATERIAL —
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INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT

DRAWN Tom [illegible] DATE 16 JAN 63
CHECKED
APPROVAL [illegible] Turner 21 JAN 63
APPROVAL Eldon C Hall 23 Jan 63
NASA APPROVAL W J [illegible] 1-23-63
MIT APPROVAL [illegible] 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "L"

CODE IDENT NO
SIZE E
NASA DRAWING NO 1C06526
SCALE NONE
WT
SHEET 1 OF 1

1C06526

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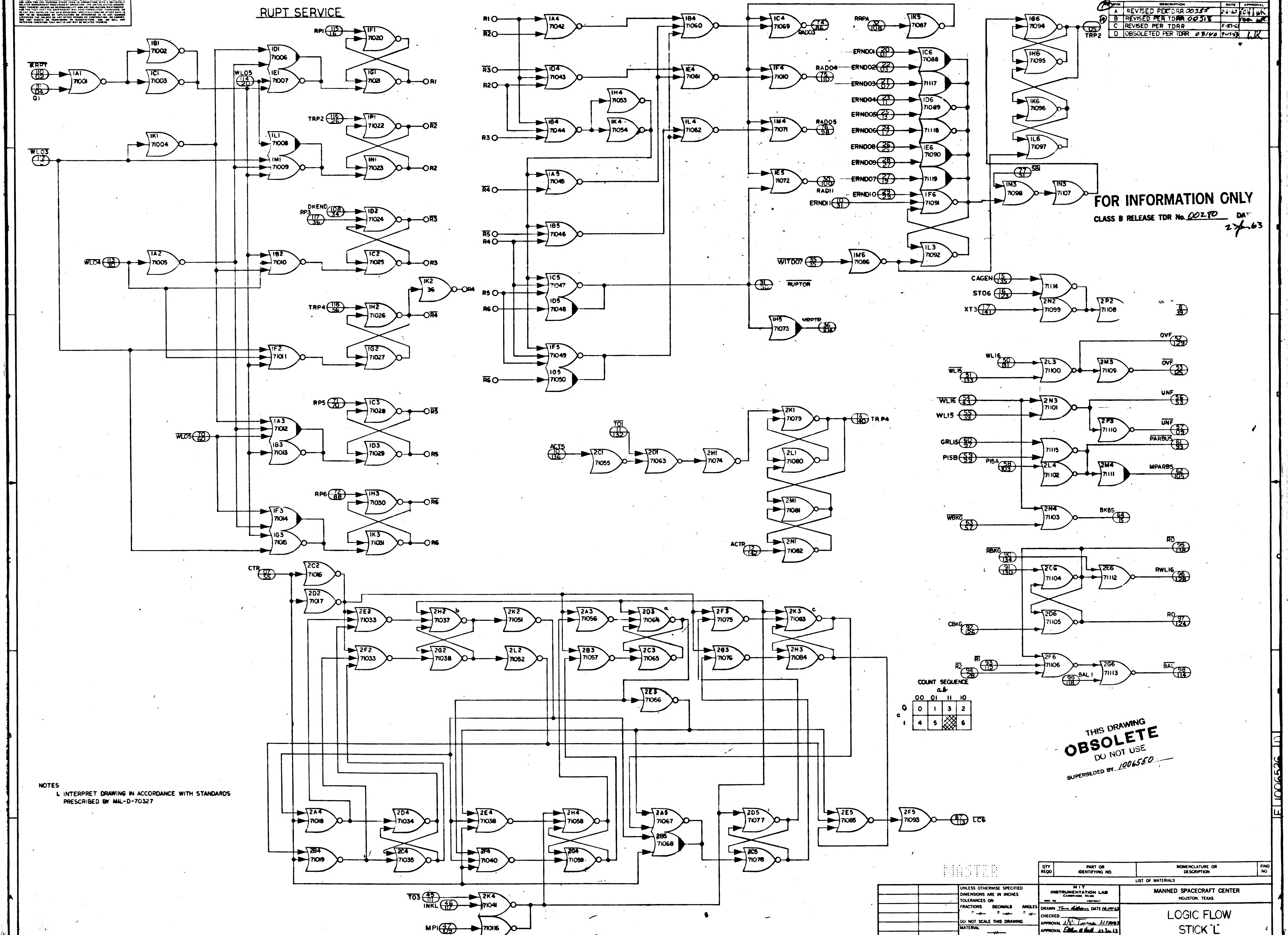
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00355	2-6-63	ECH WK
B	REVISED PER TDRR 00518		WK
C	REVISED PER TDRR	5-23-63	
D	OBSOLETED PER TDRR 03140	9-11-63	WK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R̄4
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R5
R6
R̄6
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IB1 71002
IC1 71003
IK1 71004
IA2 71005
ID1 71006
IE1 71007
IL1 71008
IM1 71009
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IG3 71015
IF1 71020
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IP1 71022
IN1 71023
ID2 71024
IC2 71025
IM2 71026
IG2 71027
IC3 71028
ID3 71029
IH3 71030
IK3 71031
IK2 36
IA4 71042
ID4 71043
IG4 71044
IA5 71045
IB5 71046
IC5 71047
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IF5 71049
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IM4 71053
IK4 71054
IB4 71060
IE4 71061
IL4 71062
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IF4 71070
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IH5 71073
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RAD04
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RAD11
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CAGEN
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XT3
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OVF
O̅V̅F̅
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PARBUS
GRL15
PI5B
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MPARBS
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RWL16
R̄O̅
RO
CBKG
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R̄2
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BAL 1
2G6 71113
B̄ĀL̄
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2C5 71078
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MPI
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71116
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b
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COUNT SEQUENCE
a b
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c
Q
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4 5 6

NOTES

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
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MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN Tom Gibbons DATE 16 JAN 63
CHECKED
APPROVAL W.B. Turner 21 JAN 63
APPROVAL Eldon C Hall 22 Jan 63
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK "L"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006526
SCALE NONE
WT
SHEET 1 OF 1

E 1006526 D

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			

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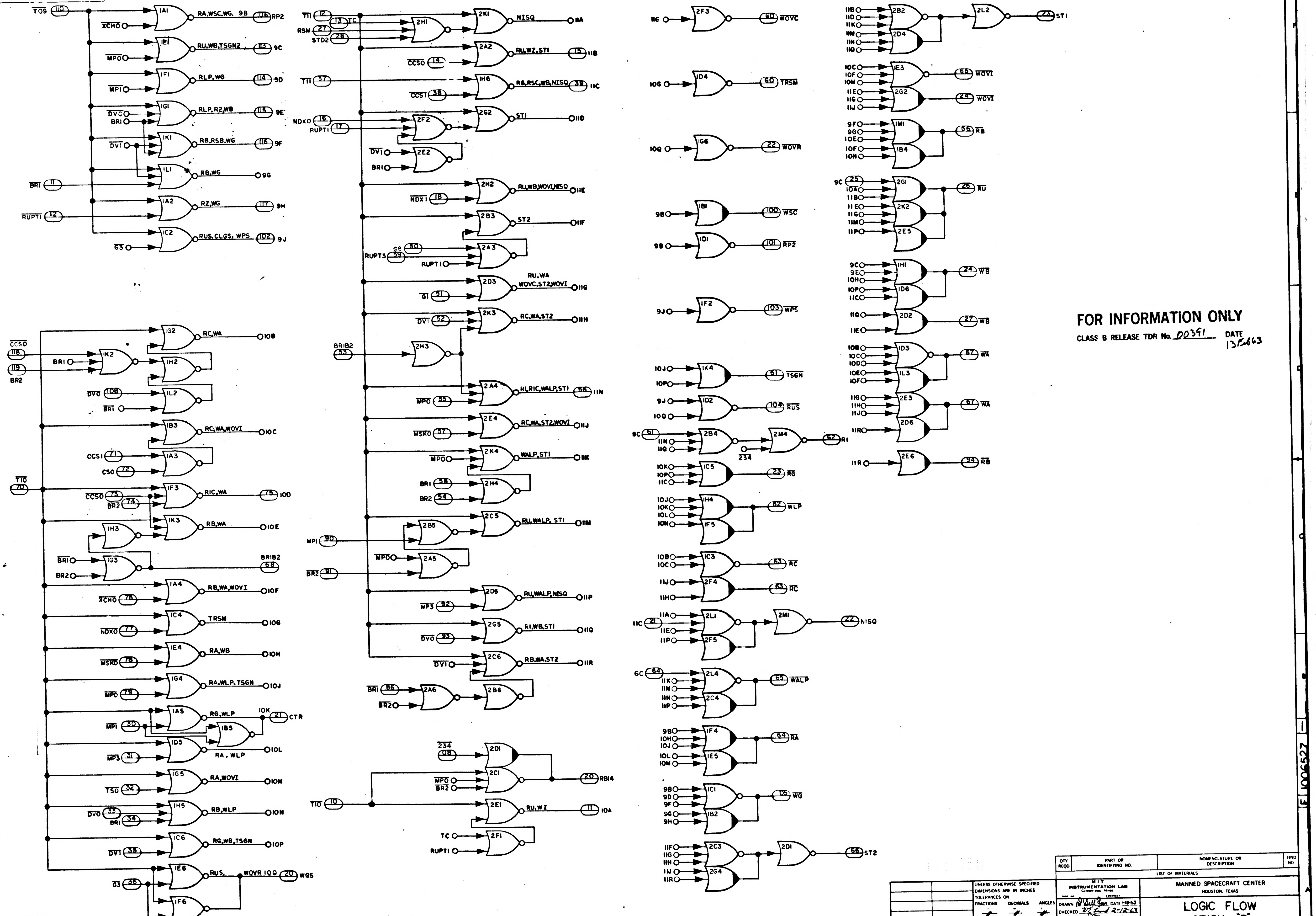
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MPO
MPI
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DVI
BRI 111
RUPTI 112
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1A1 RA,WSC,WG, 9B 108 RP2
1E1 RU,WB,TSGN2 113 9C
1F1 RLP,WG 114 9D
1G1 RLP,R2,WB 115 9E
1K1 RB,RSB,WG 116 9F
1L1 RB,WG 9G
1A2 RZ,WG 117 9H
1C2 RUS,CLGS,WPS 102 9J
TII 12
RSM 27
STD2 28
13 TC
2H1
2K1 NISQ 11A
2A2 RU,WZ,ST1 15 11B
CCS0 14
TII 37
1H6 RB,RSC,WB,NISQ 38 11C
CCS1 38
2G2 ST1 11D
NDXO 16
RUPTI 17
2F2
DVI
BRI
2E2
2H2 RU,WB,WOVI,NISQ 11E
NDXI 18
2B3 ST2 11F
RUPT3 G8 50 59
2A3
RUPTI
2D3 RU,WA WOVC,ST2,WOVI 11G
G1 51
2K3 RC,WA,ST2 11H
DVI 52
BRIB2 53
2H3
2A4 RI,RIC,WALP,ST1 56 11N
MPO 55
2E4 RC,WA,ST2,WOVI 11J
MSKO 57
MPO
2K4 WALP,ST1 11K
BRI 58
BR2 54
2H4
2C5 RU,WALP, ST1 11M
MPI 90
2B5
MPO
2A5
BR2 91
2D5 RU,WALP,NISQ 11P
MP3 92
2G5 RI,WB,ST1 11Q
DVO 93
2C6 RB,WA,ST2 11R
DVI
BRI 86
BR2
2A6
2B6
234 08
2D1
MPO
BR2
2C1
20 RBI4
T10 10
2E1 RU,WZ 11 10A
TC
RUPTI
2F1
CCS0
BR1 118
BR2 119
1K2
1G2 RC,WA 10B
1H2
DVO 108
BRI
1L2
1B3 RC,WA,WOVI 10C
CCS1 71
CS0 72
1A3
T10 70
CCS0 73
BR2 74
1F3 RIC,WA 75 10D
1K3 RB,WA 10E
1H3
BRI
BR2
1G3
BRIB2 68
1A4 RB,WA,WOVI 10F
XCHO 76
1C4 TRSM 10G
NDXO 77
1E4 RA,WB 10H
MSKO 78
1G4 RA,WLP,TSGN 10J
MPO 79
1A5 RG,WLP
10K 21 CTR
MPI 30
1B5
1D5 RA, WLP 10L
MP3 31
1G5 RA,WOVI 10M
TS0 32
1H5 RB,WLP 10N
DVO 33
BRI 34
1C6 RG,WB,TSGN 10P
DVI 35
1E6 RUS, WOVR 10Q 20 WGS
G3 36
1F6
11C 2F3 60 WOVC
10G 1D4 60 TRSM
10Q 1G6 22 WOVR
9B 1B1 100 WSC
9B 1D1 101 RP2
9J 1F2 103 WPS
10J 10P 1K4 61 TSGN
9J 10Q 1D2 104 RUS
8C 61 11N 11Q 2B4 2M4 62 RI
234
10K 10P 11C 1C5 23 RG
10J 10K 10L 10N 1H4 1F5 62 WLP
10B 10C 1C3 63 RC
11J 11H 2F4 63 RC
11C 21 11A 11E 11P 2L1 2F5 2M1 22 NISQ
6C 64 11K 11M 11N 11P 2L4 2C4 65 WALP
9B 10H 10J 10L 10M 1F4 1E5 64 RA
9B 9D 9F 9G 9H 1C1 1B2 105 WG
11F 11G 11H 11J 11R 2C3 2G4 2D1 66 ST2
11B 11D 11K 11M 11N 11Q 2B2 2D4 2L2 23 ST1
10C 10F 10M 11E 11G 11J 1E3 2G2 65 WOVI 24 WOVI
9F 9G 10E 10F 10N 1M1 1B4 56 RB
9C 25 10A 11B 11E 11G 11M 11P 2G1 2K2 2E5 26 RU
9C 9E 10H 10P 11C 1H1 1D6 24 WB
11Q 11E 2D2 27 WB
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11G 11H 11J 11R 2E3 2D6 67 WA
11R 2E6 94 RB

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LIST OF MATERIALS			

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MATERIAL //
HEAT TREATMENT //
FINAL FINISH //

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN A. Dell'Erba DATE 1-18-63
CHECKED W. E. Lund 2-12-63
APPROVAL W. E. Tinnin 8 FEB 63
APPROVAL E C Hall 12 Feb 63
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL W Kupfer 13 Feb 63

MANNED SPACECRAFT CENTER
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LOGIC FLOW
STICK "R"

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006527
SCALE // WT SHEET OF 1

E 1006527

CONTROL PULSE 3

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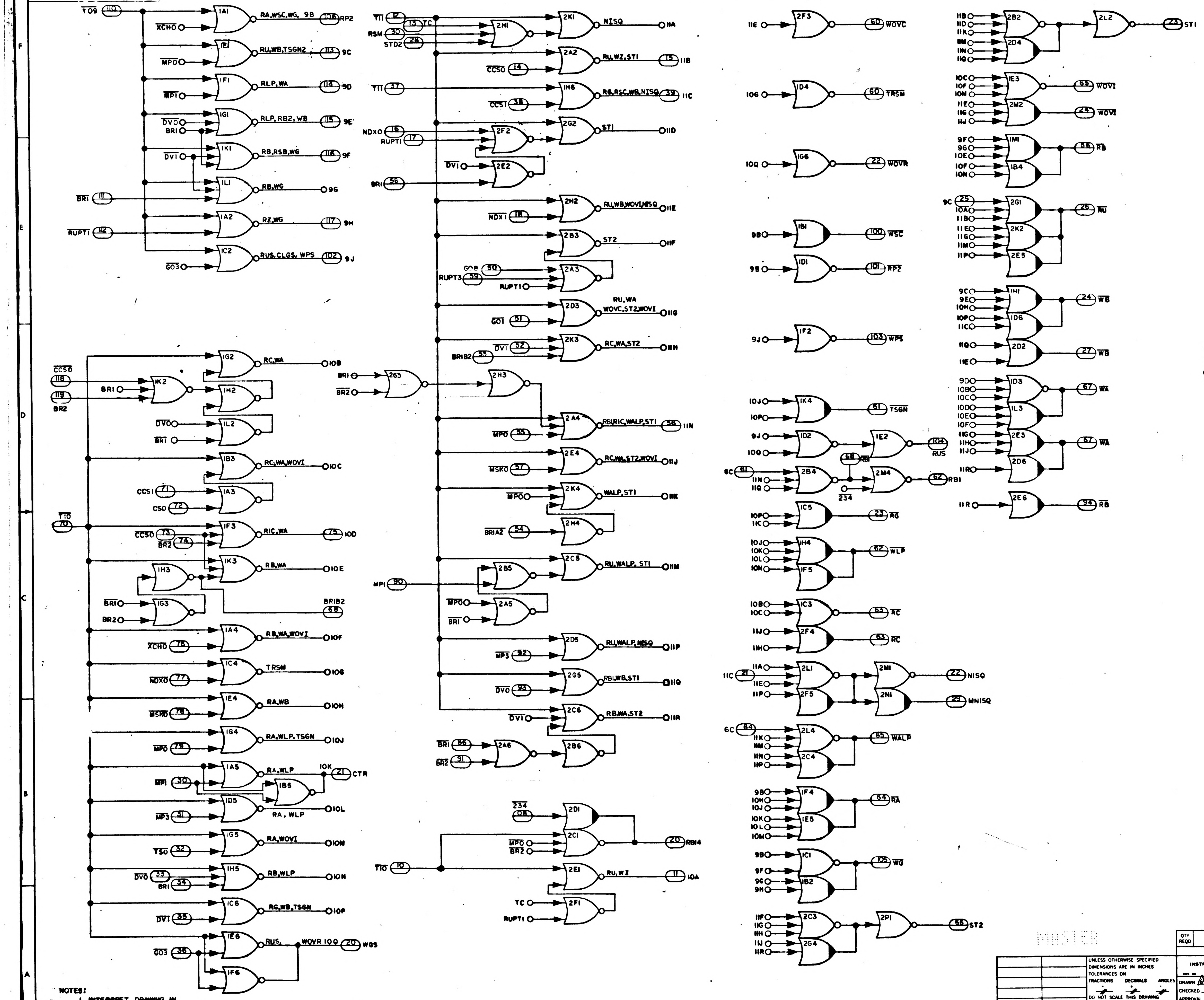
B	REVISED PER TDRR 00038	2-21-63	ECH WK



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IE1 RU,WB,TSGN2 113 9C
MPO
IF1 RLP,WA 114 9D
MPI
IG1 RLP,RB2,WB 115 9E
DVO
BRI
IK1 RB,RSB,WG 116 9F
DVI
IL1 RB,WG 9G
BRI 111
IA2 RZ,WG 117 9H
RUPTI 112
IC2 RUS,CLGS,WPS 102 9J
GO3
T11 12
RSM 30
STD2 28
TC 13
2H1
2K1 NISQ 11A
2A2 RU,WZ,ST1 15 11B
CCSO 14
T11 37
1H6 RB,RSC,WB,NISQ 39 11C
CCS1 38
NDXO 16
RUPTI 17
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2G2 ST1 11D
DVI
2E2
BRI 56
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2B3 ST2 11F
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2A3
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GO1 51
BRIB2 53
DVI 52
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CCSO 118
BRI
119 BR2
1K2
1G2 RC,WA 10B
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DVO
1L2
BRI
BRI
BR2
2G3
2H3
2A4 RBI,RIC,WALP,ST1 58 11N
MPO 55
2E4 RC,WA,ST2,WOVI 11J
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MPO
BRIA2 54
2H4
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MPI 80
2B5
MPO
BRI
2A5
1B3 RC,WA,WOVI 10C
CCS1 71
CSO 72
1A3
T10 70
CCSO 73
BR2 74
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1K3 RB,WA 10E
1H3
BRI
BR2
1G3
BRIB2 68
1A4 RB,WA,WOVI 10F
XCHO 76
1C4 TRSM 10G
NDXO 77
1E4 RA,WB 10H
MSKO 78
1G4 RA,WLP,TSGN 10J
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1A5 RA,WLP
MPI 30
1B5
10K 21 CTR
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MP3 31
1G5 RA,WOVI 10M
TSO 32
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BRI 34
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DVI 35
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GO3 36
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2D5 RU,WALP,NISQ 11P
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DVO 93
2C6 RB,WA,ST2 11R
DVI
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BR2 91
2A6
2B6
234 DB
2D1
2C1
MPO
BR2
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T10 10
2E1 RU,WZ 11 10A
TC
RUPT1
2F1
11G 2F3 60 WOVC
10G 1D4 60 TRSM
10Q 1G6 22 WOVR
9B 1B1 100 WSC
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8C 61
11N
11Q
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2M4 62 RBI
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10P 1C5 23 RG
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2N1 25 MNISQ
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11K 11M 11N 11P
2L4 2C4 65 WALP
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1F4 1E5 64 RA
9B 9F 9G 9H
1C1 1B2 105 WG
11F 11G 11H 11J 11R
2C3 2G4
2P1 66 ST2
11B 11D 11K 11M 11N 11Q
2B2 2D4
2L2 23 ST1
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1E3 2M2 68 WOVI 24 WOVI
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1M1 1B4 56 RB
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10A 11B 11E 11G 11M 11P
2G1 2K2 2E5 26 RU
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1H1 1D6 2D2 24 WB 27 WB
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11R 2E6 94 RB

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MATERIAL
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MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN DATE 1-18-63
CHECKED 2-12-63
APPROVAL 9 FEB 63
APPROVAL E C Hall 12 Feb 63
NASA APPROVAL 2-13-63
MIT APPROVAL

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HOUSTON, TEXAS

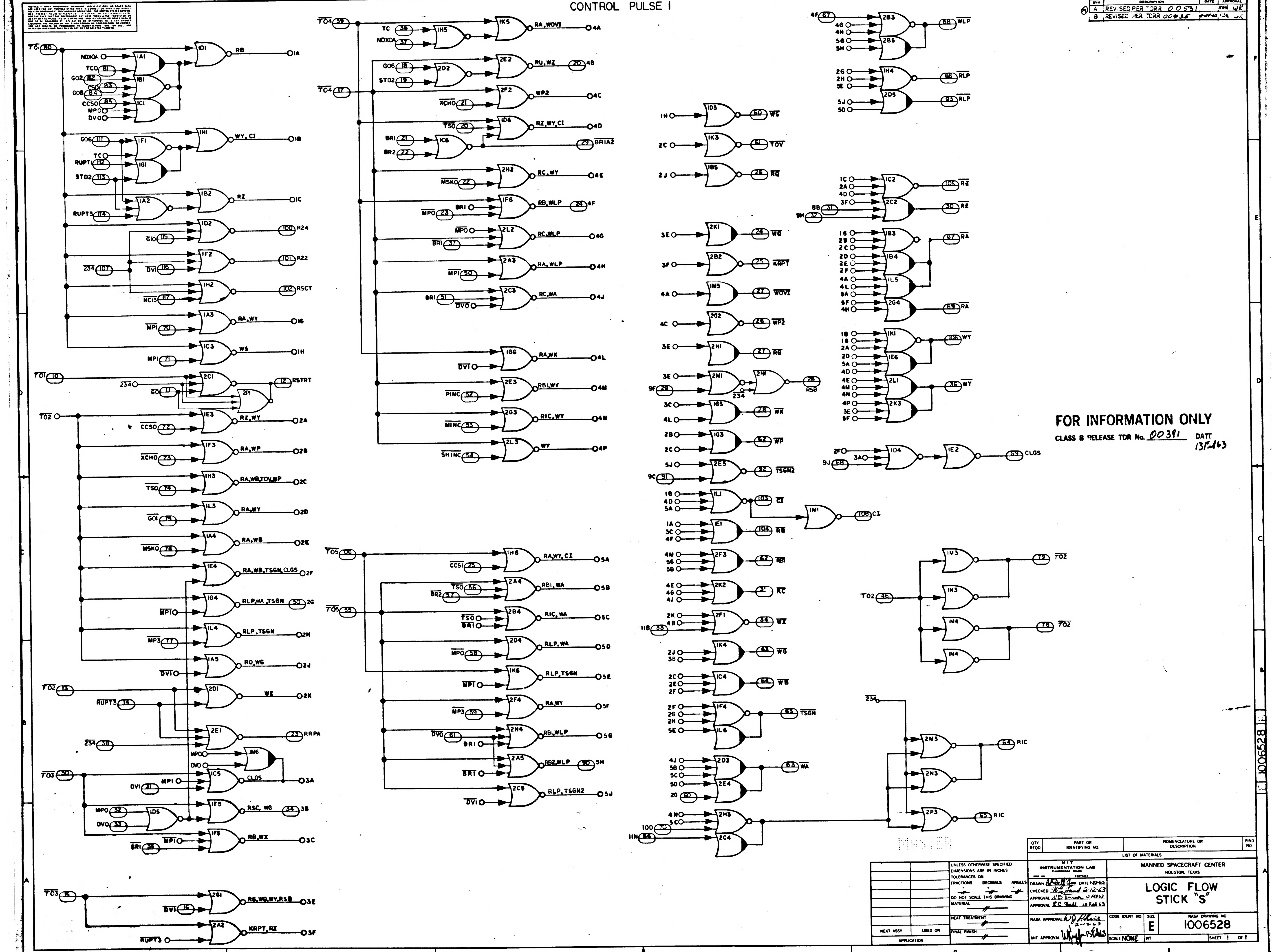
LOGIC FLOW
STICK "R"

CODE IDENT NO | SIZE E | NASA DRAWING NO. 1006527
SCALE | WT | SHEET 1 OF 1

E 1006527 A

INCHES
PHOTOGRAPHIC SCALE ONLY

CONTROL PULSE 1



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T02
T03
T04
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WS
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RA,WY
RA,WB
RA,WB,TSGN,CLGS
RLP,WA,TSGN
RLP,TSGN
RQ,WG
WZ
RRPA
CLGS
RSC, WG
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KRPT, RZ
RA,WOVI
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WP2
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WY
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RA
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CLGS
T02
RIC
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CLASS B RELEASE TDR No. 00391 DATE 13Feb63
MASTER

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00531		WK
B	REVISED PER TDRR 00935		

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MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY | USED ON
APPLICATION

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INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN DATE 1-22-63
CHECKED 2-12-63
APPROVAL 12 FEB 63
APPROVAL E C Hall 12 Feb 63
NASA APPROVAL 2-13-63
MIT APPROVAL 13 Feb 63

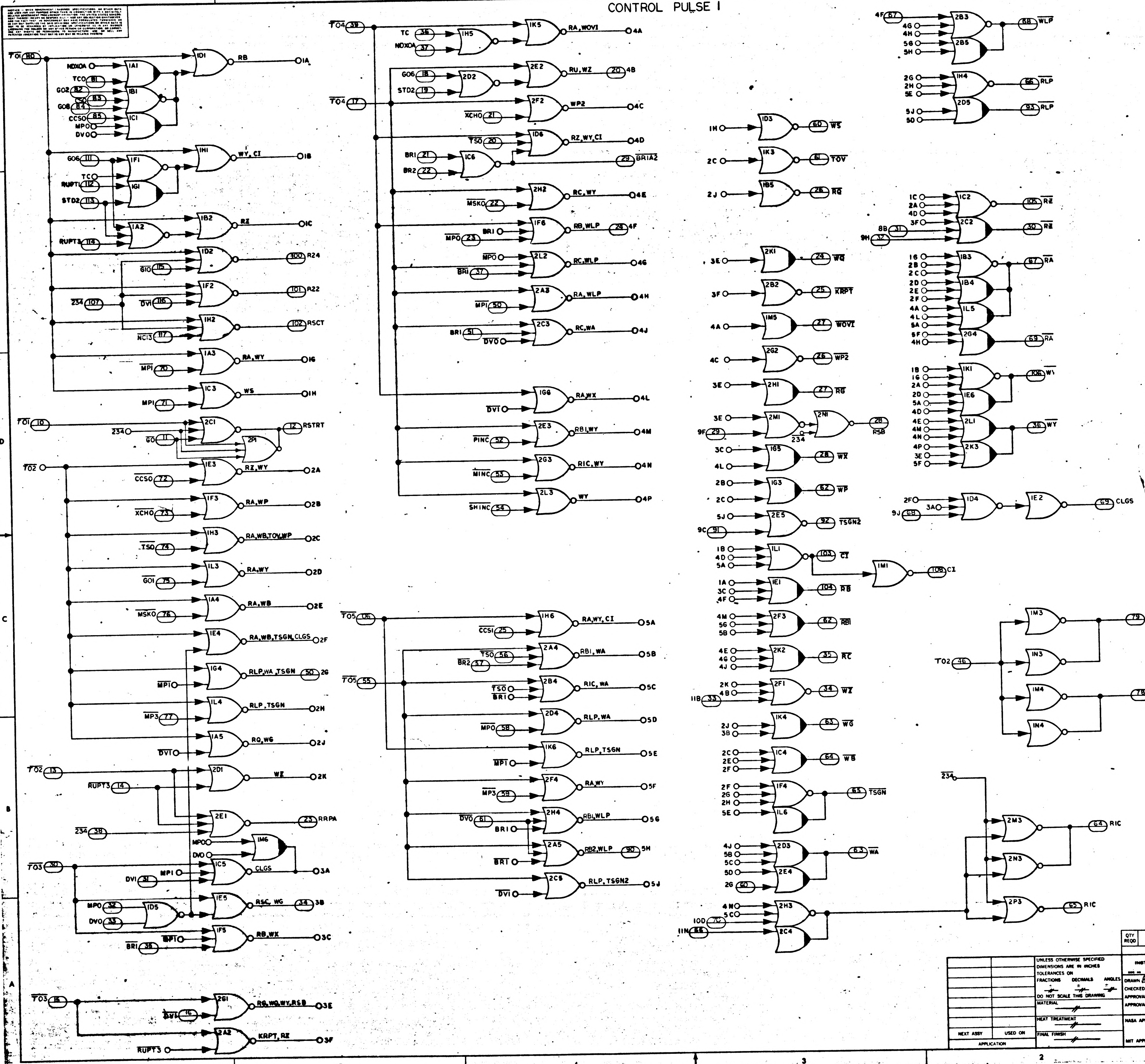
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW STICK "S"

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006528
SCALE NONE | WT | SHEET 1 OF 1

CONTROL PULSE I

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00531		WK
B	REVISED PER TDRR 00935		ECX WK
C	OBSOLETED PER TDRR 03140	2-13-63	



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RB
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GO6 111
TC
RUPT1 112
STD2 113
1F1
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WY, CI
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1B2
RZ
1C
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GIO 115
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234 107
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1H2
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1C3
WS
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GO6 18
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WP2
4C
XCHO 21
TSO 20
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RZ, WY, CI
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BR2 22
1C6
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RC, WY
4E
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CCSI 25
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BRI
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1D3
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APPROVAL 12 FEB 63
APPROVAL R C Hall 12 Feb 63
NASA APPROVAL 2-13-63
MIT APPROVAL

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LOGIC FLOW STICK "S"

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006528
SCALE NONE
WT
SHEET 1 OF 1

INCHES
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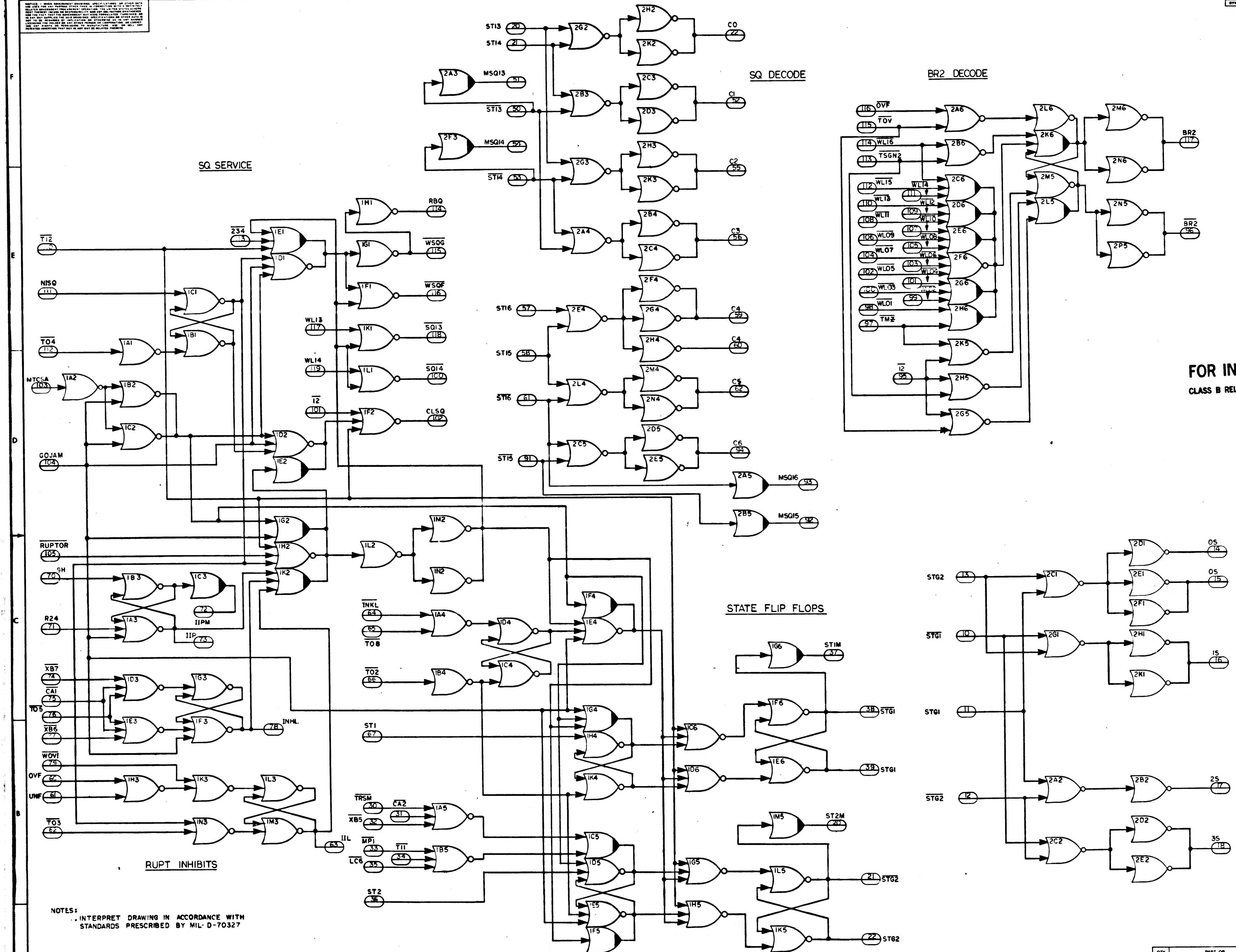
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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T04 112
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GOJAM 104
RUPTOR 105
SH 70
R24 71
72 IIPM
IIP 73
XB7 74
CA1 75
T05 76
XB6 77
INHL 78
WOVI 79
OVF 60
UNF 61
T03 62
IIL 63
RBQ 114
WSQG 115
WSQF 116
WL13 117
SQ13 118
WL14 119
SQ14 100
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CLSQ 102
INKL 64
65 T08
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TRSM 30
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XB5 32
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LC6 35
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MSQ14 54
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C3 56
ST16 57
C4 59
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ST15 91
C6 94
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MSQ15 92
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38 STG1
39 STG1
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21 STG2
22 STG2
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APPROVAL E C Hall 19 Feb 63
NASA APPROVAL Jack Barnard 2/20/63
MIT APPROVAL 20 Feb 63

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1006530

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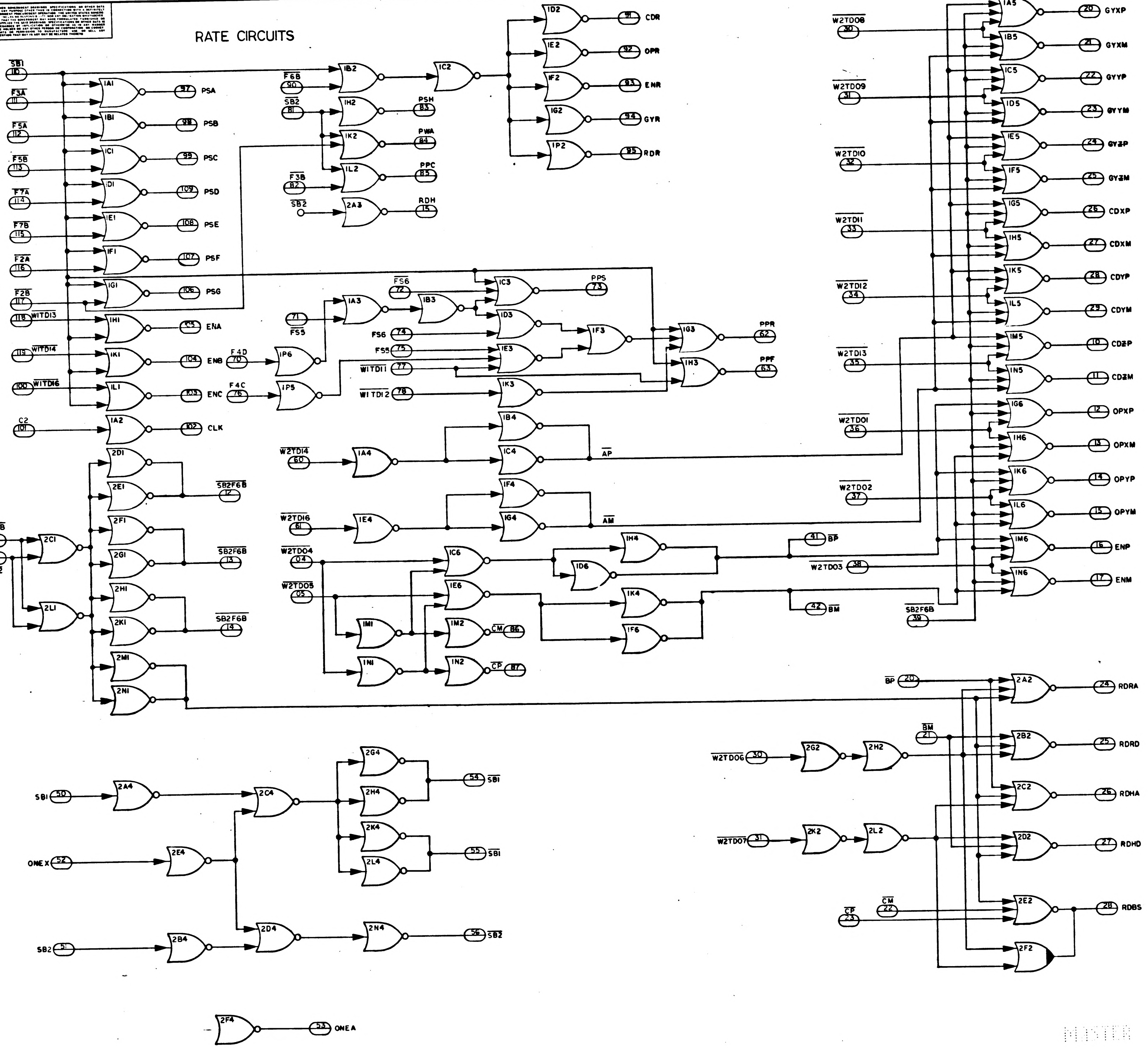
RATE CIRCUITS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1B1 98 PSB
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1G1 106 PSG
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1K1 104 ENB
1L1 103 ENC
1A2 102 CLK
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F3B 82
SB2
1B2
1H2 83 PSH
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1L2 85 PPC
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1F2 93 ENR
1G2 94 GYR
1P2 95 RDR
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FS6 74
FS5 75
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1E3
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1H3 63 PPF
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AP
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1N1
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1N2 CP 87
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W2TD03 38
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53 SB1
55 SB1
56 SB2
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APPROVAL W. B. Turner 4 Feb 63
APPROVAL C. C. Hall 12 Feb 63
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL W. Ryder 13 Feb

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LOGIC FLOW
STICK T

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006529
SCALE — WT SHEET 1 OF 1

1006529

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REVISIONS			
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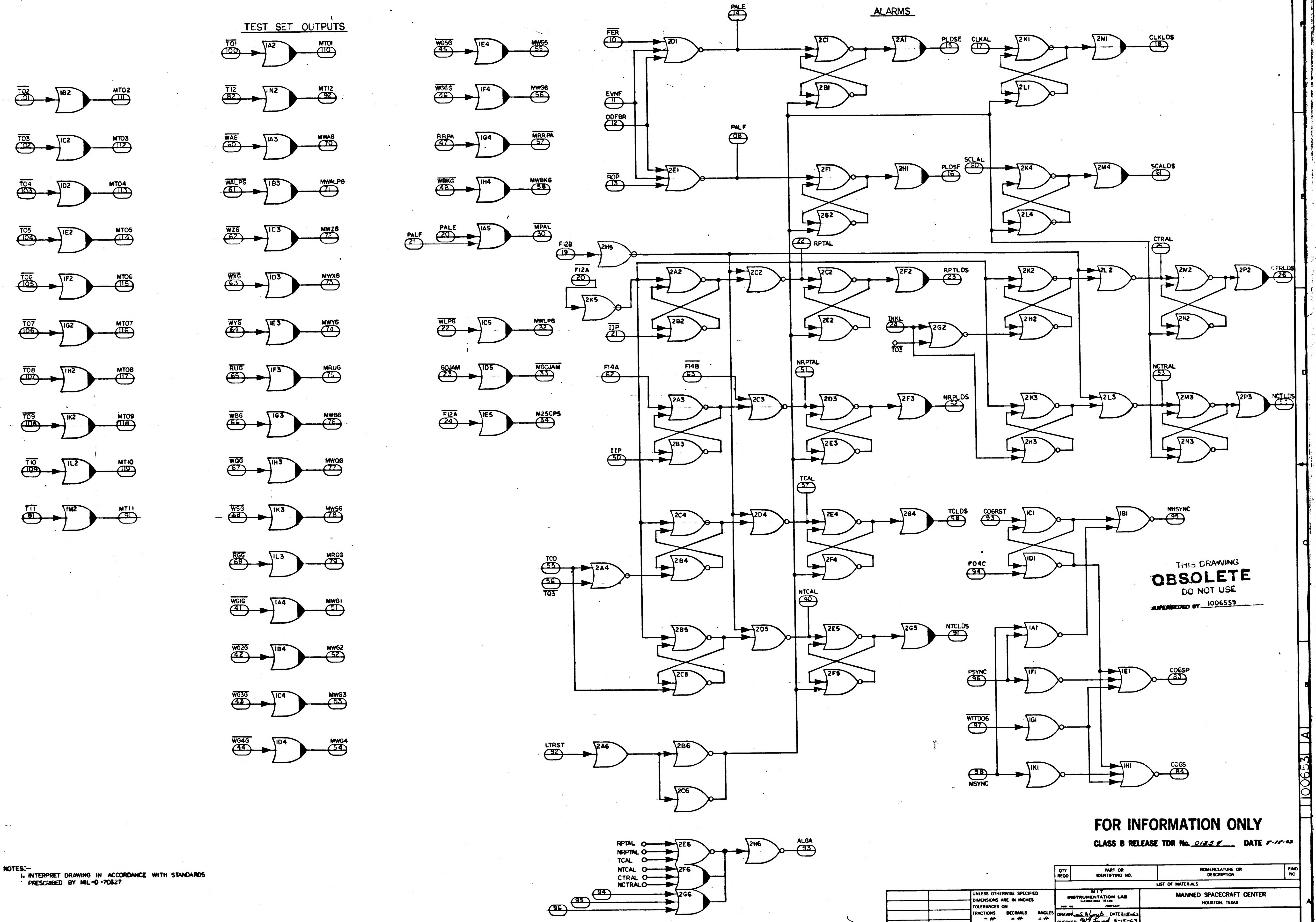
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F14B 63
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TCO 55
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LTRST 92
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CO6RST 93
F04C 94
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IA1 IF1 IG1 IK1 IE1 IH1
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CO6SP 83
WITDO6 97
98 MSYNC
COGS 84
RPTAL NRPTAL TCAL NTCAL CTRAL NCTRAL
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ALGA 93
94 95 96

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CHECKED 5-15-63
APPROVAL
APPROVAL Eldon C. Hall 5-15-63
NASA APPROVAL
MIT APPROVAL 15 May 63

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LOGIC FLOW STICK V

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006531
SCALE — WT SHEET OF

1006531 A

REVISIONS CLASS A TORR 00559

SYM	DESCRIPTION	DATE	APPROVAL

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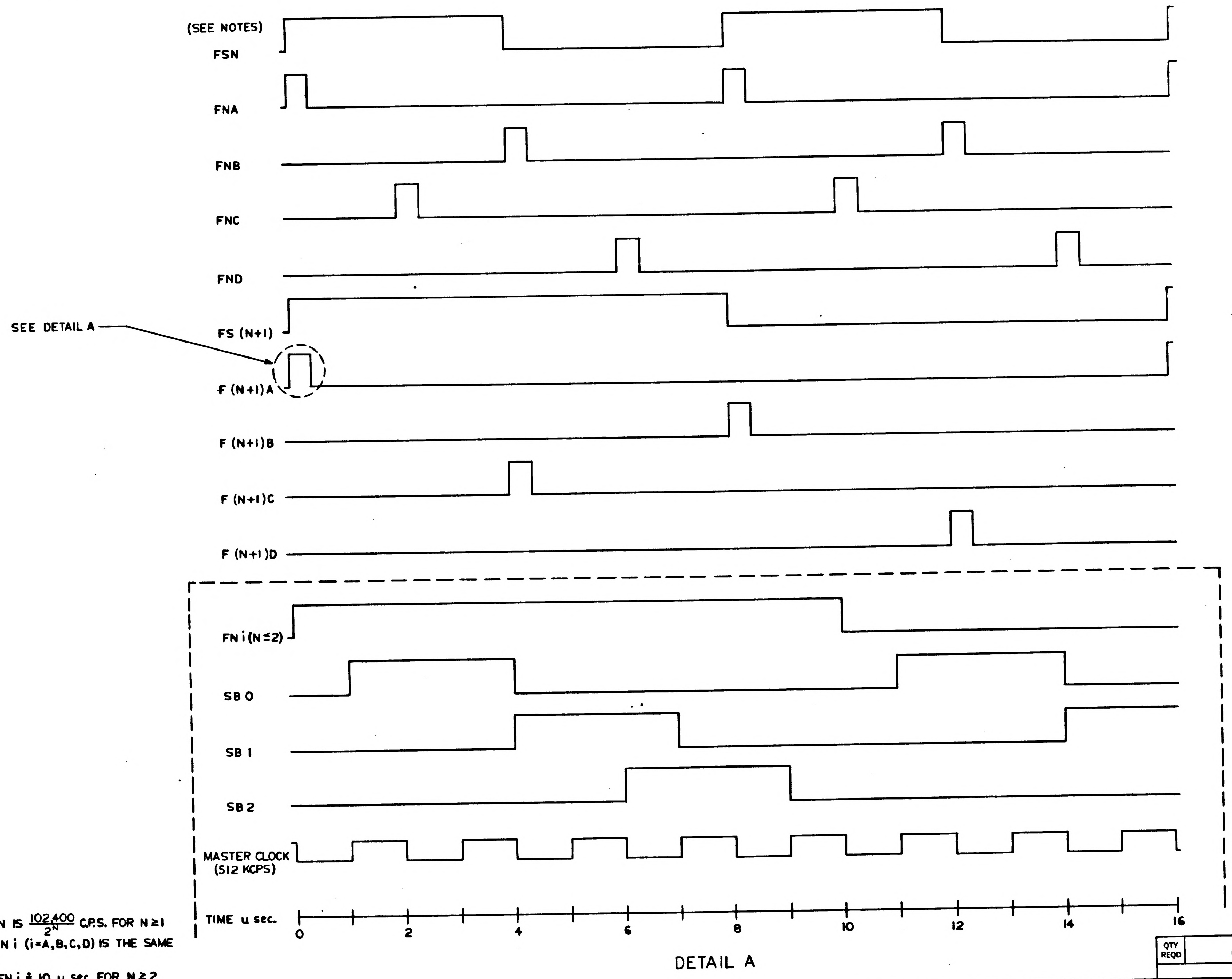

NOTES:

1. THE FREQUENCY OF FSN IS $\frac{102,400}{2^N}$ C.P.S. FOR $N \geq 1$
   THE PULSE RATIO OF FN i (i=A,B,C,D) IS THE SAME AS FSM
   THE PULSE WIDTH OF FN i ≐ 10 u sec. FOR $N \geq 2$
   THE PULSE WIDTH OF F1 i ≐ 3 u sec.
2. SIGNAL POLARITY AS MEASURED WITH RESPECT TO REFERENCE, NASA DWG 1006009

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APPROVAL Ellen C Hall 13 Mar 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

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PULSE TIMING

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INCHES
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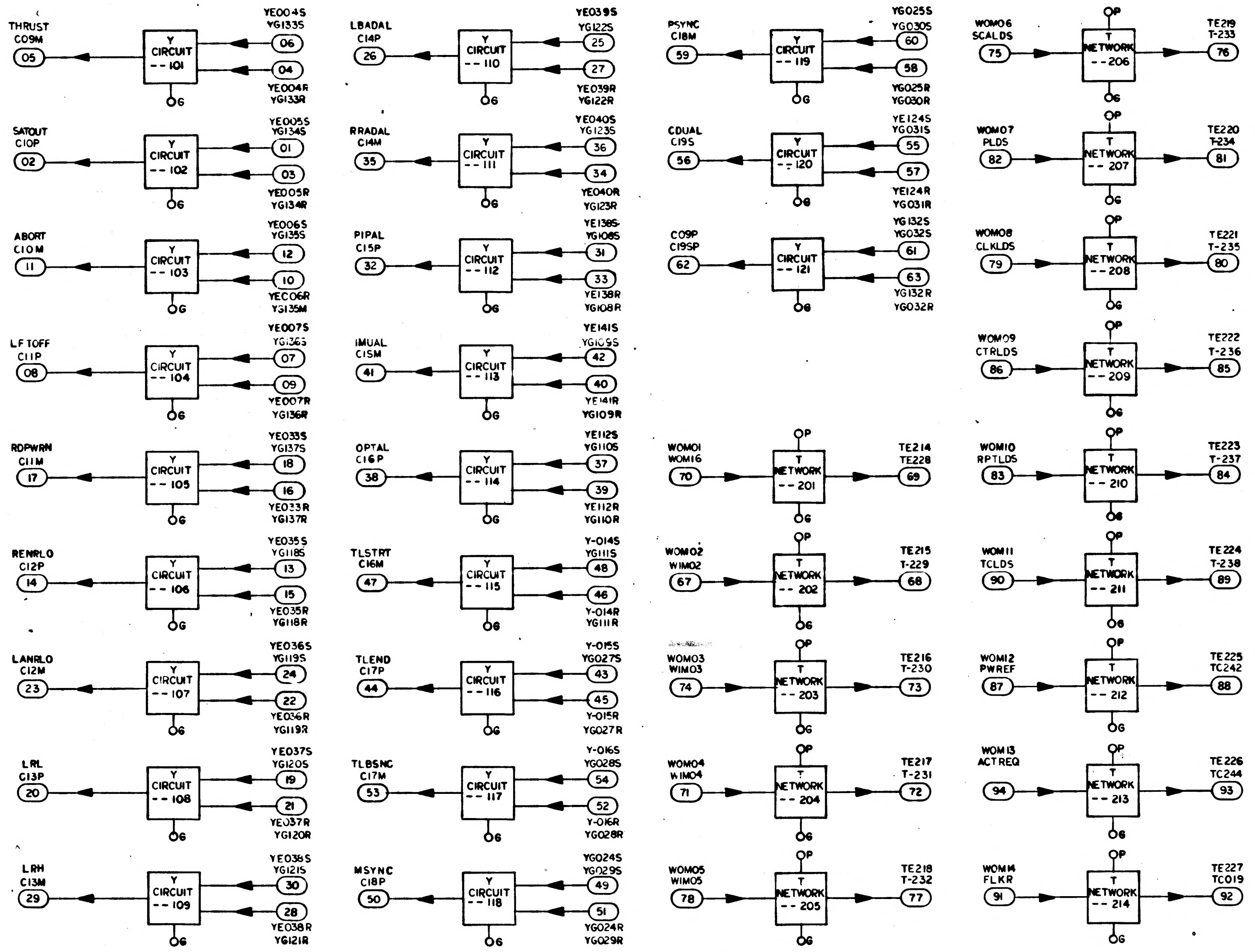
REVISIONS TDRR 02048			
SYM	DESCRIPTION	DATE	APPROVAL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SATOUT C10P 02 Y CIRCUIT --102 YE005S YG134S 01 03 YE005R YG134R G
ABORT C10M 11 Y CIRCUIT --103 YE006S YG135S 12 10 YEC06R YS135M G
LFTOFF C11P 08 Y CIRCUIT --104 YE007S YG136S 07 09 YE007R YG136R G
RDPWRN C11M 17 Y CIRCUIT --105 YE033S YG137S 18 16 YE033R YG137R G
RENRLO C12P 14 Y CIRCUIT --106 YE035S YG118S 13 15 YE035R YG118R G
LANRLO C12M 23 Y CIRCUIT --107 YE036S YG119S 24 22 YE036R YG119R G
LRL C13P 20 Y CIRCUIT --108 YE037S YG120S 19 21 YE037R YG120R G
LRH C13M 29 Y CIRCUIT --109 YE038S YG121S 30 28 YE038R YG121R G
LBADAL C14P 26 Y CIRCUIT --110 YE039S YG122S 25 27 YE039R YG122R G
RRADAL C14M 35 Y CIRCUIT --111 YE040S YG123S 36 34 YE040R YG123R G
PIPAL C15P 32 Y CIRCUIT --112 YE138S YG108S 31 33 YE138R YG108R G
IMUAL C15M 41 Y CIRCUIT --113 YE141S YG109S 42 40 YE141R YG109R G
OPTAL C16P 38 Y CIRCUIT --114 YE112S YG110S 37 39 YE112R YG110R G
TLSTRT C16M 47 Y CIRCUIT --115 Y-014S YG111S 48 46 Y-014R YG111R G
TLEND C17P 44 Y CIRCUIT --116 Y-015S YG027S 43 45 Y-015R YG027R G
TLBSNC C17M 53 Y CIRCUIT --117 Y-016S YG028S 54 52 Y-016R YG028R G
MSYNC C18P 50 Y CIRCUIT --118 YG024S YG029S 49 51 YG024R YG029R G
PSYNC C18M 59 Y CIRCUIT --119 YG025S YG030S 60 58 YG025R YG030R G
CDUAL C19S 56 Y CIRCUIT --120 YE124S YG031S 55 57 YE124R YG031R G
C09P C19SP 62 Y CIRCUIT --121 YG132S YG032S 61 63 YG132R YG032R G
WOM01 WOM16 70 P T NETWORK --201 G TE214 TE228 69
WOM02 WIM02 67 P T NETWORK --202 G TE215 T-229 68
WOM03 WIM03 74 P T NETWORK --203 G TE216 T-230 73
WOM04 WIM04 71 P T NETWORK --204 G TE217 T-231 72
WOM05 WIM05 78 P T NETWORK --205 G TE218 T-232 77
WOM06 SCALDS 75 P T NETWORK --206 G TE219 T-233 76
WOM07 PLDS 82 P T NETWORK --207 G TE220 T-234 81
WOM08 CLKLDS 79 P T NETWORK --208 G TE221 T-235 80
WOM09 CTRLDS 86 P T NETWORK --209 G TE222 T-236 85
WOM10 RPTLDS 83 P T NETWORK --210 G TE223 T-237 84
WOM11 TCLDS 90 P T NETWORK --211 G TE224 T-238 89
WOM12 PWREF 87 P T NETWORK --212 G TE225 TC242 88
WOM13 ACTREQ 94 P T NETWORK --213 G TE226 TC244 93
WOM14 FLKR 91 P T NETWORK --214 G TE227 TC019 92

REFERENCE DWG:
1. 1006087: "Y" TRANSFORMER INPUT CIRCUIT
2. 1006088: INTERFACE CIRCUITS

NOTES:
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2. CIRCUIT NUMBERS FOR COMPUTER POSITION 19 ARE PREFIXED BY 71
CIRCUIT NUMBERS FOR COMPUTER POSITION 39 ARE PREFIXED BY 73
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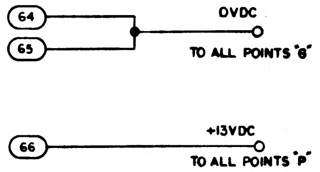
LOWER SIGNAL NAME USED IN COMPUTER POSITION 39


64
65
0VDC
TO ALL POINTS "G"
66
+13VDC
TO ALL POINTS "P"

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN P. Ramsay DATE 2-10-63
CHECKED
APPROVAL WS Turner 7/16/63
APPROVAL EC Hall by Albert Hopkins
NASA APPROVAL W J [illegible] 7-17-63
MIT APPROVAL [illegible] 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A19 OR A39

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006534
SCALE NONE
WT
SHEET 1 OF 1

MASTER

1006534

INCHES
PHOTOGRAPHIC SCALE ONLY

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REVISIONS TDRR 02048			
SYM	DESCRIPTION	DATE	APPROVAL
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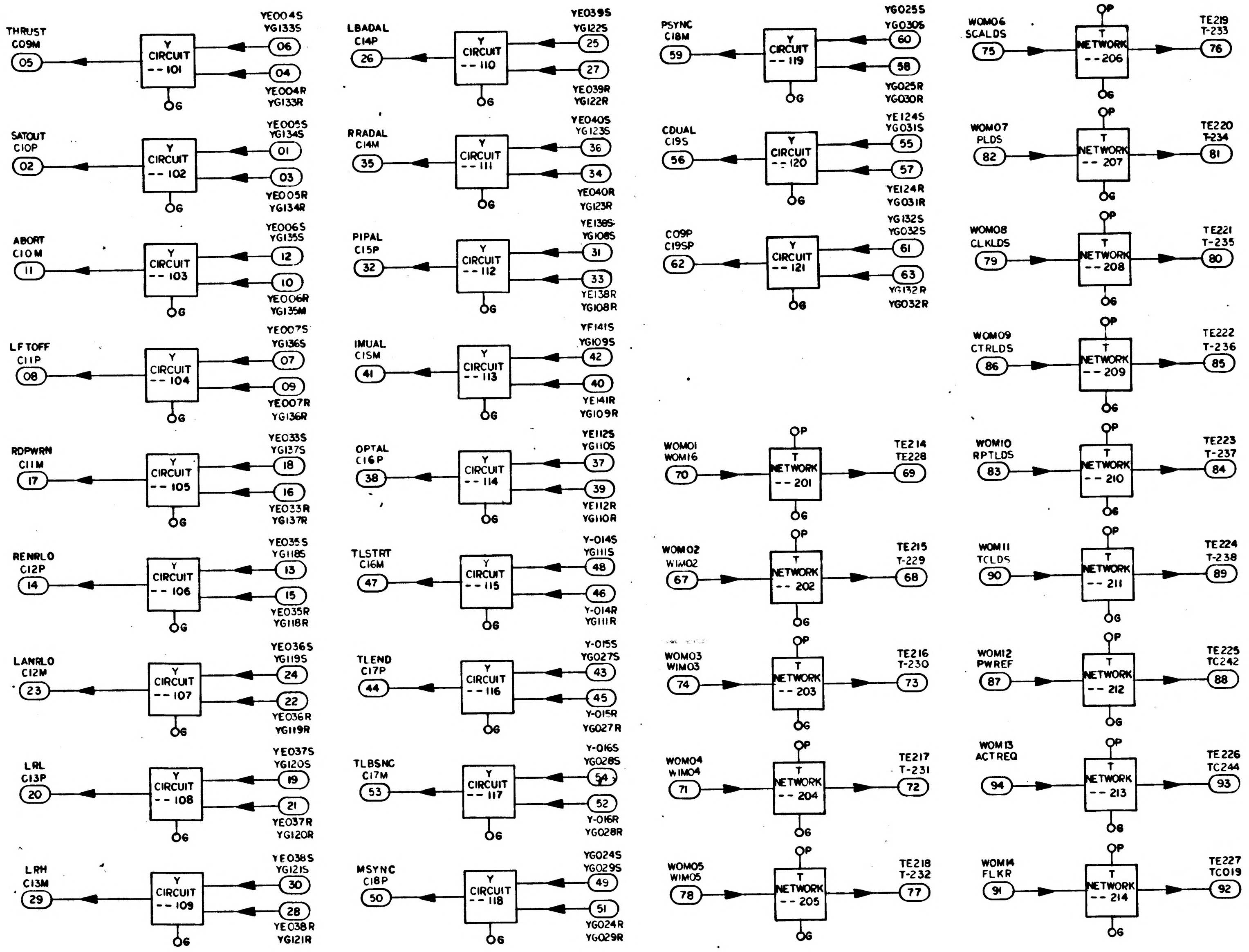
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Y CIRCUIT --101
YE004S
YG133S
06
04
YE004R
YG133R
G
SATOUT
C10P
02
Y CIRCUIT --102
YE005S
YG134S
01
03
YE005R
YG134R
ABORT
C10M
11
Y CIRCUIT --103
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YG135S
12
10
YE006R
YG135M
LFTOFF
C11P
08
Y CIRCUIT --104
YE007S
YG136S
07
09
YE007R
YG136R
RDPWRN
C11M
17
Y CIRCUIT --105
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YG137S
18
16
YE033R
YG137R
RENRLO
C12P
14
Y CIRCUIT --106
YE035S
YG118S
13
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YE035R
YG118R
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C12M
23
Y CIRCUIT --107
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YG119S
24
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LRL
C13P
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LRH
C13M
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YE038R
YG121R
LBADAL
C14P
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YE039S
YG122S
25
27
YE039R
YG122R
RRADAL
C14M
35
Y CIRCUIT --111
YE040S
YG123S
36
34
YE040R
YG123R
PIPAL
C15P
32
Y CIRCUIT --112
YE138S
YG108S
31
33
YE138R
YG108R
IMUAL
C15M
41
Y CIRCUIT --113
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YG109S
42
40
YE141R
YG109R
OPTAL
C16P
38
Y CIRCUIT --114
YE112S
YG110S
37
39
YE112R
YG110R
TLSTRT
C16M
47
Y CIRCUIT --115
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YG111S
48
46
Y-014R
YG111R
TLEND
C17P
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Y CIRCUIT --116
Y-015S
YG027S
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45
Y-015R
YG027R
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C17M
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YG028S
54
52
Y-016R
YG028R
MSYNC
C18P
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Y CIRCUIT --118
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YG029S
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51
YG024R
YG029R
PSYNC
C18M
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Y CIRCUIT --119
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YG030S
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58
YG025R
YG030R
CDUAL
C19S
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Y CIRCUIT --120
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YG031S
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YE124R
YG031R
C09P
C19SP
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Y CIRCUIT --121
YG132S
YG032S
61
63
YG132R
YG032R
WOM01
WOM16
70
T NETWORK --201
TE214
TE228
69
P
WOM02
WIM02
67
T NETWORK --202
TE215
T-229
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WOM03
WIM03
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T NETWORK --203
TE216
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T NETWORK --204
TE217
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WOM05
WIM05
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T NETWORK --205
TE218
T-232
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WOM06
SCALDS
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T NETWORK --206
TE219
T-233
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WOM07
PLDS
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T NETWORK --207
TE220
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WOM08
CLKLDS
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T NETWORK --208
TE221
T-235
80
WOM09
CTRLDS
86
T NETWORK --209
TE222
T-236
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WOM10
RPTLDS
83
T NETWORK --210
TE223
T-237
84
WOM11
TCLDS
90
T NETWORK --211
TE224
T-238
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87
T NETWORK --212
TE225
TC242
88
WOM13
ACTREQ
94
T NETWORK --213
TE226
TC244
93
WOM14
FLKR
91
T NETWORK --214
TE227
TC019
92

REFERENCE DWG:
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2. 1006088: INTERFACE CIRCUITS

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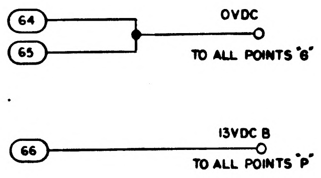
64
65
0VDC
TO ALL POINTS "G"
66
13VDC B
TO ALL POINTS "P"

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO
CONTRACT
DRAWN R. Romey DATE 2-10-63
CHECKED
APPROVAL WHS Turner 7/16/63
APPROVAL E C Hall by [illegible]
NASA APPROVAL W J [illegible] 7-17-63
MIT APPROVAL [illegible] 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A19 OR A39

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006534
SCALE NONE
WT
SHEET 1 OF 1

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REVISIONS TDRR 02048

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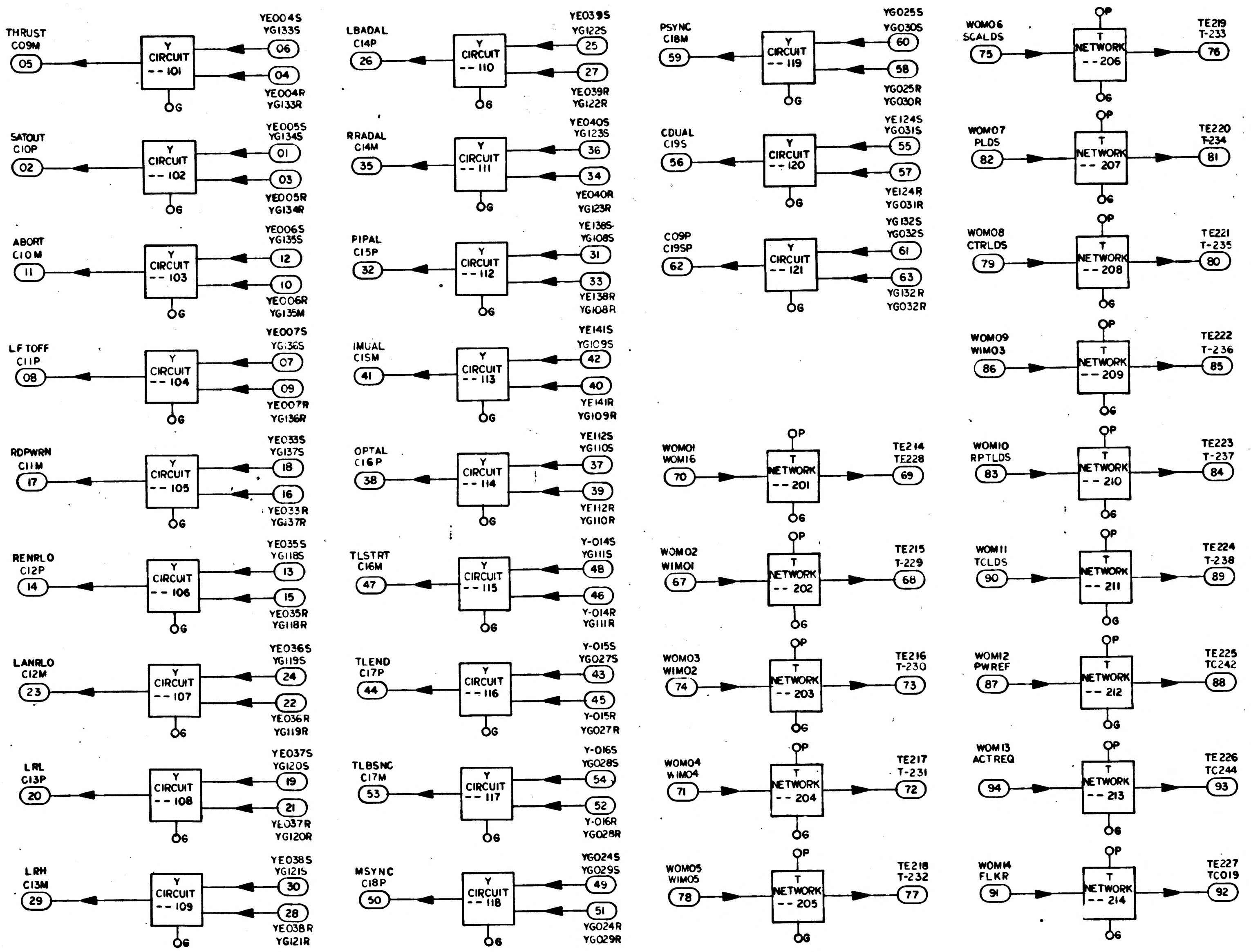
B	REVISED PER TDRR 04343	1-30-64	WK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Y CIRCUIT -- 101
YE004S
YG133S
06
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YE004R
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G
SATOUT
C10P
02
Y CIRCUIT -- 102
YE005S
YG134S
01
03
YE005R
YG134R
ABORT
C10M
11
Y CIRCUIT -- 103
YE006S
YG135S
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10
YE006R
YG135M
LF TOFF
C11P
08
Y CIRCUIT -- 104
YE007S
YG136S
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YE007R
YG136R
RDPWRN
C11M
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Y CIRCUIT -- 105
YE033S
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RENRLO
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Y CIRCUIT -- 106
YE035S
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Y CIRCUIT -- 113
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YG109R
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Y CIRCUIT -- 114
YE112S
YG110S
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39
YE112R
YG110R
TLSTRT
C16M
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Y CIRCUIT -- 115
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YG111S
48
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YG111R
TLEND
C17P
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Y CIRCUIT -- 116
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YG027S
43
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Y-015R
YG027R
TLBSNC
C17M
53
Y CIRCUIT -- 117
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YG028S
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52
Y-016R
YG028R
MSYNC
C18P
50
Y CIRCUIT -- 118
YG024S
YG029S
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C18M
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Y CIRCUIT -- 119
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YG030S
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YG025R
YG030R
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C19S
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Y CIRCUIT -- 120
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YG031S
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YE124R
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C09P
C19SP
62
Y CIRCUIT -- 121
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YG032S
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YG132R
YG032R
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WOM16
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PLDS
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PWREF
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TC242
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WOM13
ACTREQ
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T NETWORK -- 213
TE226
TC244
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WOM14
FLKR
91
T NETWORK -- 214
TE227
TC019
92

REFERENCE DWG:
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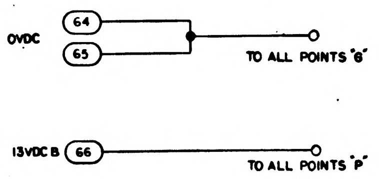
0VDC
64
65
TO ALL POINTS "G"
13VDC B
66
TO ALL POINTS "P"

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN R. Rooney DATE 2-18-63
CHECKED
APPROVAL WB Turner 7/16/63
APPROVAL E C Hall by Albert Hopkins
NASA APPROVAL W. J. Rhine 7-17-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A19 OR A39

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006534
SCALE NONE
WT
SHEET 1 OF 1

1006534 B

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

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REVISIONS TDRR 02048

SYM	DESCRIPTION	DATE	APPROVAL
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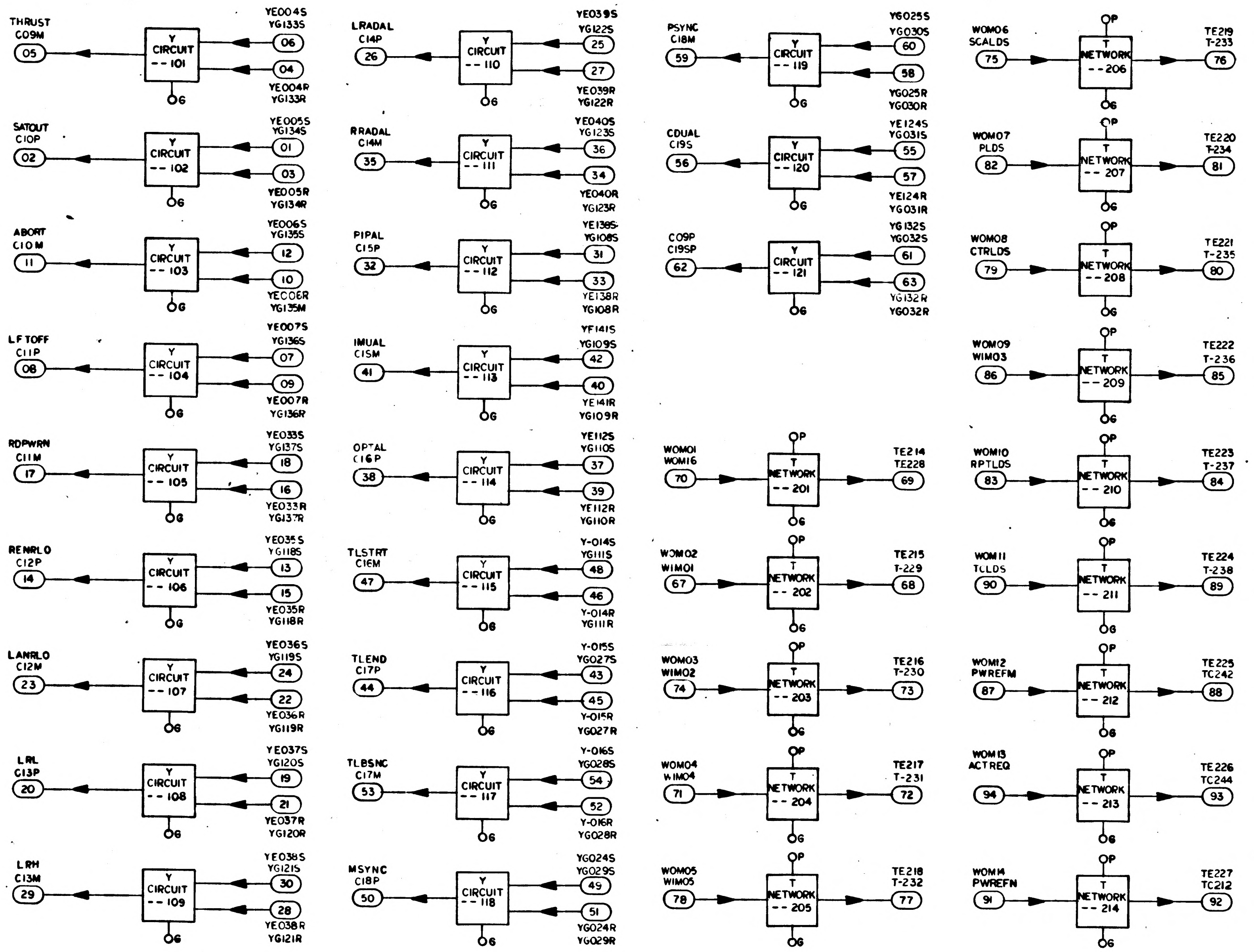
B	REVISED PER TDRR 04343	[illegible]	WK
C	REVISED PER TDRR 06032	[illegible]	[illegible]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Y CIRCUIT --101
YE004S
YG133S
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04
YE004R
YG133R
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SATOUT
C10P
02
Y CIRCUIT --102
YE005S
YG134S
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YE005R
YG134R
ABORT
C10M
11
Y CIRCUIT --103
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YE006R
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LFTOFF
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Y CIRCUIT --104
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Y CIRCUIT --106
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Y CIRCUIT --107
YE036S
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Y CIRCUIT --120
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C19SP
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Y CIRCUIT --121
YG132S
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WOM01
WOM16
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T NETWORK --201
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TE228
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T NETWORK --212
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TC242
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PWREFN
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TC212
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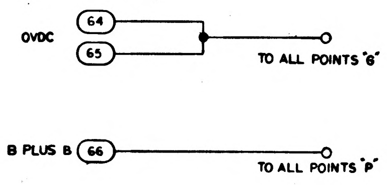
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64
65
TO ALL POINTS "G"
B PLUS B
66
TO ALL POINTS "P"

NOTES:
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REFERENCE DWG:
1.1006087: "Y" TRANSFORMER INPUT CIRCUIT
2.1006088: INTERFACE CIRCUITS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
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INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN R Romay DATE 2-10-63
CHECKED
APPROVAL W S Turner 7/16/63
APPROVAL E C Hall by [illegible]
NASA APPROVAL [illegible] 7-17-63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A19 OR A39

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006534
SCALE NONE
WT
SHEET 1 OF 1

MASTER

SYM	DESCRIPTION	DATE	APPROVAL
A	OBSOLETED PER TDRR 03/40	9-13-63	

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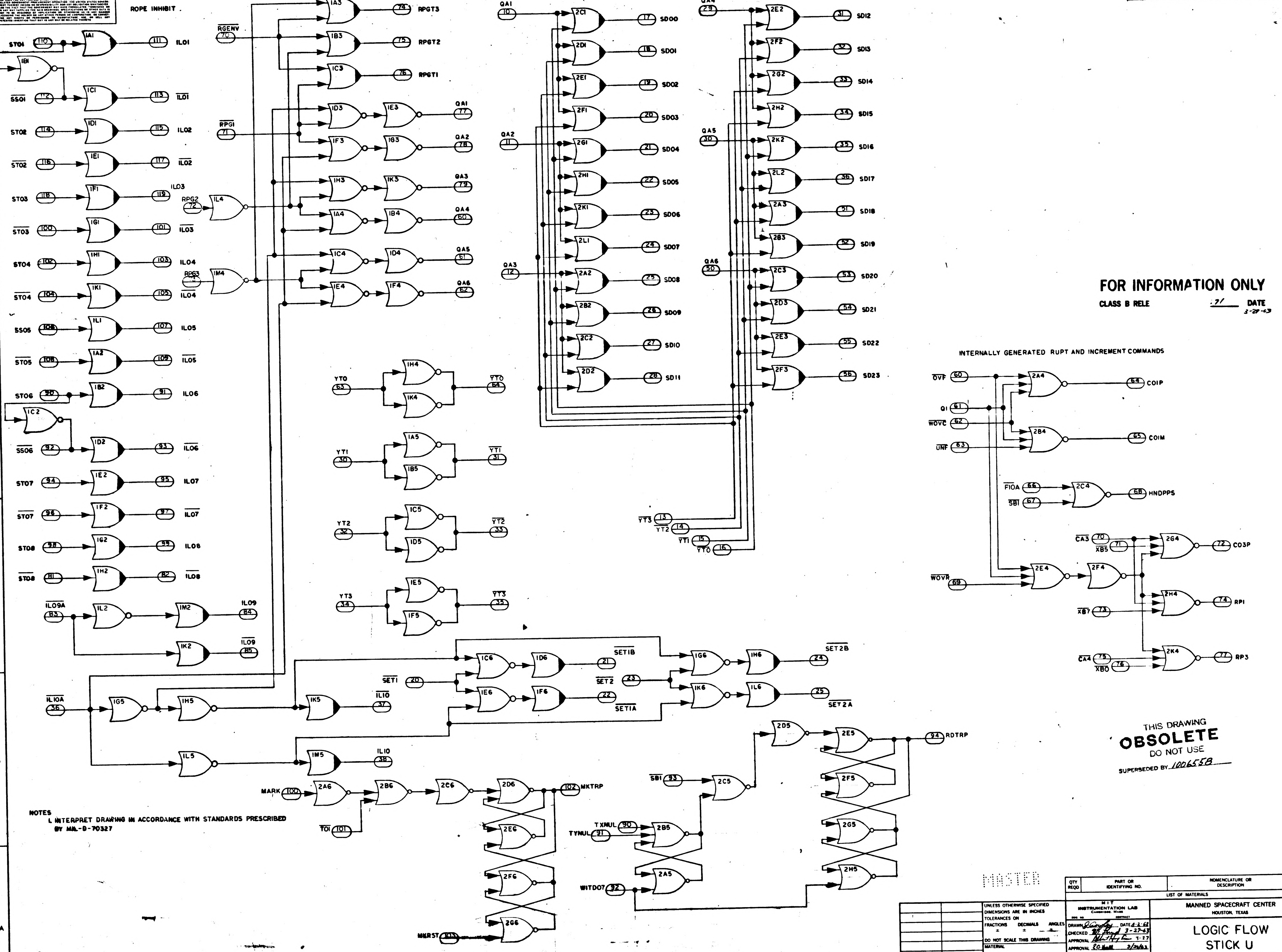
ROPE INHIBIT
STO1 110 IA1 111 ILO1
IB1
SSO1 112 IC1 113 ILO1
STO2 114 ID1 115 ILO2
STO2 116 IE1 117 ILO2
STO3 118 IF1 119 ILO3
STO3 100 IG1 101 ILO3
STO4 102 IH1 103 ILO4
STO4 104 IK1 105 ILO4
SSO5 106 IL1 107 ILO5
STO5 108 IA2 109 ILO5
STO6 90 IB2 91 ILO6
IC2
SSO6 92 ID2 93 ILO6
STO7 94 IE2 95 ILO7
STO7 96 IF2 97 ILO7
STO8 98 IG2 99 ILO8
STO8 81 IH2 82 ILO8
ILO9A 83 IL2 IM2 ILO9 84
IK2 ILO9 85
RGENV 70
RPG1 71
RPG2 72 IL4
RPG3 73 IM4
IA3 74 RPGT3
IB3 75 RPGT2
IC3 76 RPGT1
ID3 IE3 QA1 77
IF3 IG3 QA2 78
IH3 IK3 QA3 79
IA4 IB4 QA4 60
IC4 ID4 QA5 61
IE4 IF4 QA6 62
YTO 63 IH4 IK4 YT0 64
YT1 30 IA5 IB5 YT1 31
YT2 32 IC5 ID5 YT2 33
YT3 34 IE5 IF5 YT3 35
STRAND SELECTION
QA1 10
QA2 11
QA3 12
2C1 17 SD00
2D1 18 SD01
2E1 19 SD02
2F1 20 SD03
2G1 21 SD04
2H1 22 SD05
2K1 23 SD06
2L1 24 SD07
2A2 25 SD08
2B2 26 SD09
2C2 27 SD10
2D2 28 SD11
QA4 29
QA5 30
QA6 50
2E2 31 SD12
2F2 32 SD13
2G2 33 SD14
2H2 34 SD15
2K2 35 SD16
2L2 36 SD17
2A3 51 SD18
2B3 52 SD19
2C3 53 SD20
2D3 54 SD21
2E3 55 SD22
2F3 56 SD23
YT3 13
YT2 14
YT1 15
YT0 16
INTERNALLY GENERATED RUPT AND INCREMENT COMMANDS
OVF 60
Q1 61
WOVC 62
UNF 63
2A4 64 COIP
2B4 65 COIM
FIOA 66
SBI 67
2C4 68 HNDPPS
CA3 70
XB5 71
2G4 72 CO3P
WOVR 69
2E4 2F4
2H4 74 RP1
XB7 73
CA4 75
XB0 76
2K4 77 RP3
ILIOA 36 IG5 IH5
IK5 ILIO 37
IL5 IM5 IL10 38
SET1 20
IC6 ID6 21 SET1B
IE6 IF6 22 SET1A
SET2 23
IG6 IH6 24 SET2B
IK6 IL6 25 SET2A
MARK 100 2A6 2B6 2C6 2D6 102 MKTRP
T01 101
2E6
2F6
2G6
MKRST 103
SBI 93 2C5
TXNUL 90 TYNUL 91 2B5
WITDO7 92 2A5
2D5 2E5 94 RDTRP
2F5
2G5
2H5

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

FOR INFORMATION ONLY

CLASS B RELE .71 DATE 3-27-63

THIS DRAWING
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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
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DRAWN J Conley DATE 4-2-62
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APPROVAL 3-27
APPROVAL EC Hall 3/27/63
NASA APPROVAL 3-27-63
MIT APPROVAL 27 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW
STICK U

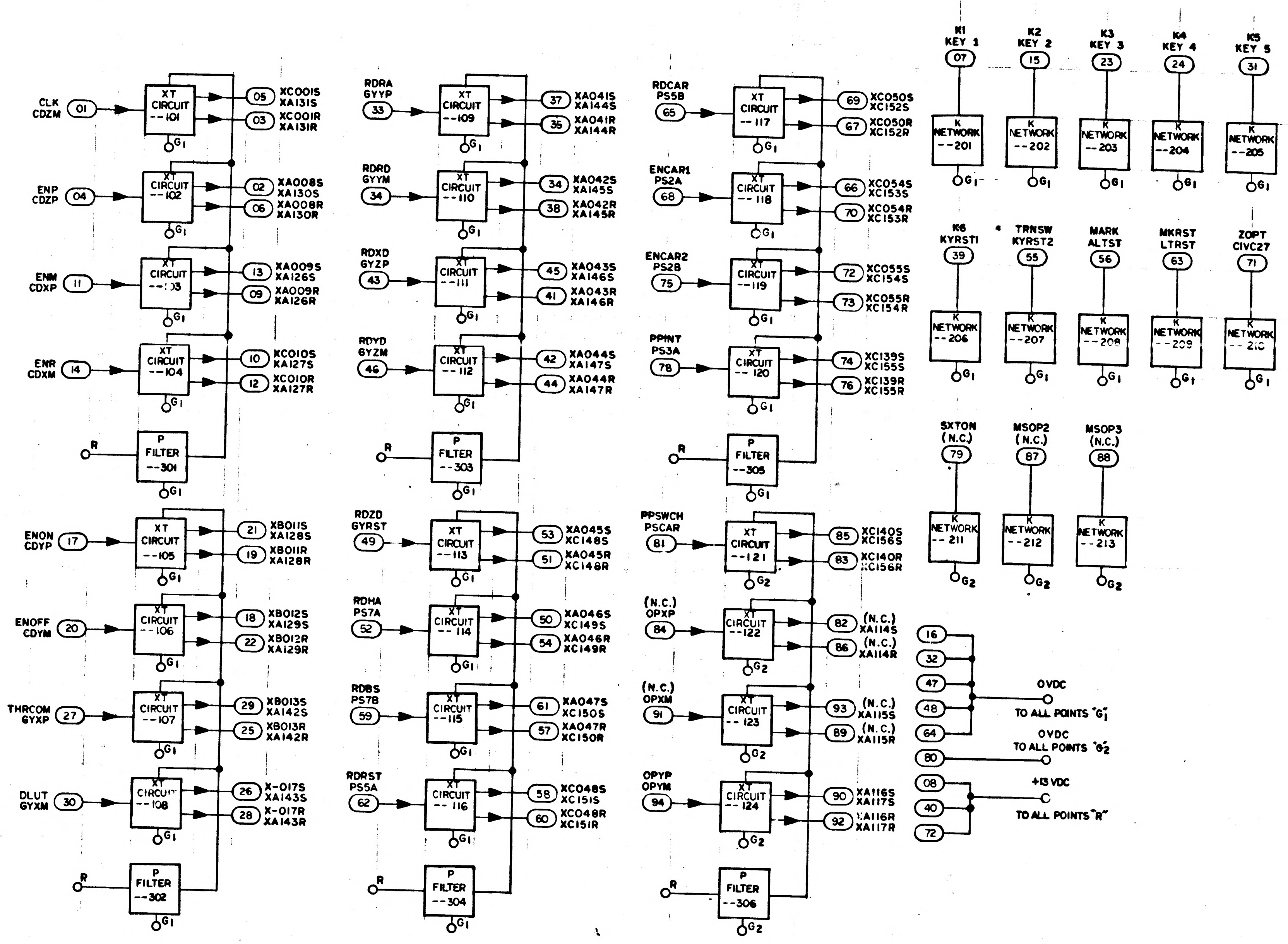
CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006533
SCALE
WT
SHEET OF

1006533 A

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS TDRR 12048			


CLK
CDZM
01
XT CIRCUIT --101
05 XC001S XA131S
03 XC001R XA131R
ENP
CDZP
04
XT CIRCUIT --102
02 XA008S XA130S
06 XA008R XA130R
ENM
CDXP
11
XT CIRCUIT --103
13 XA009S XA126S
09 XA009R XA126R
ENR
CDXM
14
XT CIRCUIT --104
10 XC010S XA127S
12 XC010R XA127R
R
P FILTER --301
ENON
CDYP
17
XT CIRCUIT --105
21 XB011S XA128S
19 XB011R XA128R
ENOFF
CDYM
20
XT CIRCUIT --106
18 XB012S XA129S
22 XB012R XA129R
THRCOM
GYXP
27
XT CIRCUIT --107
29 XB013S XA142S
25 XB013R XA142R
DLUT
GYXM
30
XT CIRCUIT --108
26 X-017S XA143S
28 X-017R XA143R
P FILTER --302
RDRA
GYYP
33
XT CIRCUIT --109
37 XA041S XA144S
35 XA041R XA144R
RDRD
GYYM
34
XT CIRCUIT --110
34 XA042S XA145S
38 XA042R XA145R
RDXD
GYZP
43
XT CIRCUIT --111
45 XA043S XA146S
41 XA043R XA146R
RDYD
GYZM
46
XT CIRCUIT --112
42 XA044S XA147S
44 XA044R XA147R
P FILTER --303
RDZD
GYRST
49
XT CIRCUIT --113
53 XA045S XC148S
51 XA045R XC148R
RDHA
PS7A
52
XT CIRCUIT --114
50 XA046S XC149S
54 XA046R XC149R
RDBS
PS7B
59
XT CIRCUIT --115
61 XA047S XC150S
57 XA047R XC150R
RDRST
PS5A
62
XT CIRCUIT --116
58 XC048S XC151S
60 XC048R XC151R
P FILTER --304
RDCAR
PS5B
65
XT CIRCUIT --117
69 XC050S XC152S
67 XC050R XC152R
ENCAR1
PS2A
68
XT CIRCUIT --118
66 XC054S XC153S
70 XC054R XC153R
ENCAR2
PS2B
75
XT CIRCUIT --119
72 XC055S XC154S
73 XC055R XC154R
PPINT
PS3A
78
XT CIRCUIT --120
74 XC139S XC155S
76 XC139R XC155R
P FILTER --305
PPSWCH
PSCAR
81
XT CIRCUIT --121
85 XC140S XC156S
83 XC140R XC156R
(N.C.)
OPXP
84
XT CIRCUIT --122
82 (N.C.) XA114S
86 (N.C.) XA114R
(N.C.)
OPXM
91
XT CIRCUIT --123
93 (N.C.) XA115S
89 (N.C.) XA115R
OPYP
OPYM
94
XT CIRCUIT --124
90 XA116S XA117S
92 XA116R XA117R
P FILTER --306
G1
G2
K1 KEY 1 07 K NETWORK --201
K2 KEY 2 15 K NETWORK --202
K3 KEY 3 23 K NETWORK --203
K4 KEY 4 24 K NETWORK --204
K5 KEY 5 31 K NETWORK --205
K6 KYRST1 39 K NETWORK --206
TRNSW KYRST2 55 K NETWORK --207
MARK ALTST 56 K NETWORK --208
MKRST LTRST 63 K NETWORK --209
ZOPT CIVC27 71 K NETWORK --210
SXTON (N.C.) 79 K NETWORK --211
MSOP2 (N.C.) 87 K NETWORK --212
MSOP3 (N.C.) 88 K NETWORK --213
16
32
47
48
64
0VDC
TO ALL POINTS "G1"
80
0VDC
TO ALL POINTS "G2"
08
40
72
+13 VDC
TO ALL POINTS "R"

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CIRCUIT NUMBERS FOR COMPUTER POSITION 20 ARE PREFIXED BY 72
   CIRCUIT NUMBERS FOR COMPUTER POSITION 40 ARE PREFIXED BY 74
3. UPPER SIGNAL NAME USED IN COMPUTER POSITION 20
   LOWER SIGNAL NAME USED IN COMPUTER POSITION 40
4. (N.C.) DENOTES NO CONNECTION WHEN MODULE USED IN POSITION INDICATED

REFERENCE DRAWINGS:
1006009 XT TRANSFORMER OUTPUT CIRCUIT
1006088 INTERFACE CIRCUITS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	
APPLICATION		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —	DO NOT SCALE THIS DRAWING	
MATERIAL —	HEAT TREATMENT —	FINAL FINISH —
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS	DWG NO.	CONTRACT
DRAWN	DATE 10 JUL 63	
CHECKED		
APPROVAL	7/16/63	
APPROVAL		
NASA APPROVAL W J Rhine 7-17-63		
MIT APPROVAL	7/17/63	
MANNED SPACECRAFT CENTER HOUSTON, TEXAS		
FLOW DIAGRAM INTERFACE MODULE A20 OR A40		
CODE IDENT NO.	SIZE E	NASA DRAWING NO. 1006535
SCALE —	WT	SHEET 1 OF 1

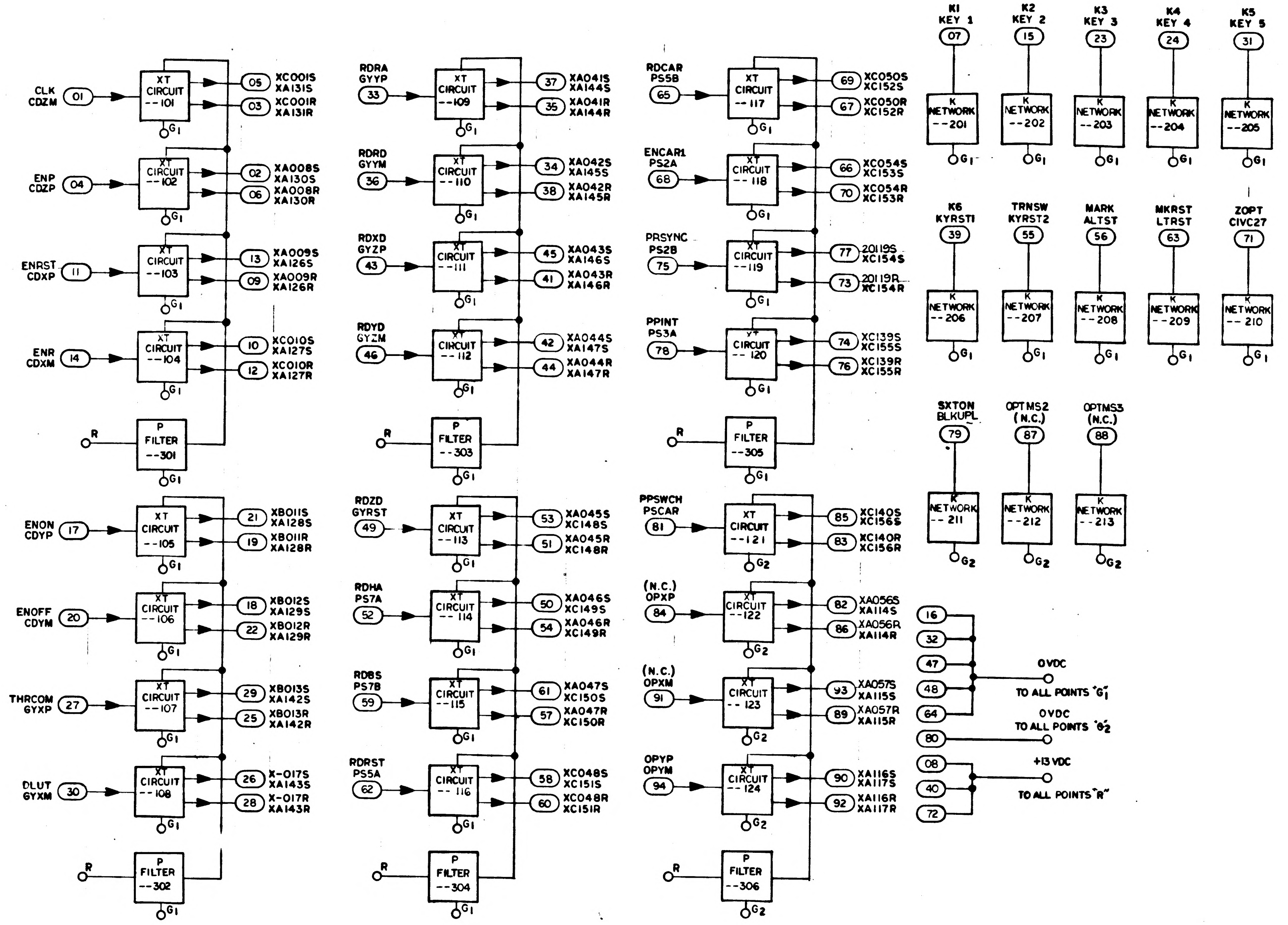
1006535

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02699	8/12/63	

REVISIONS TDRR 12048



CLK CDZM 01
XT CIRCUIT --101
05 XC001S XA131S
03 XC001R XA131R
ENP CDZP 04
XT CIRCUIT --102
02 XA008S XA130S
06 XA008R XA130R
ENRST CDXP 11
XT CIRCUIT --103
13 XA009S XA126S
09 XA009R XA126R
ENR CDXM 14
XT CIRCUIT --104
10 XC010S XA127S
12 XC010R XA127R
R
P FILTER --301
ENON CDYP 17
XT CIRCUIT --105
21 XB011S XA128S
19 XB011R XA128R
ENOFF CDYM 20
XT CIRCUIT --106
18 XB012S XA129S
22 XB012R XA129R
THRCOM GYXP 27
XT CIRCUIT --107
29 XB013S XA142S
25 XB013R XA142R
DLUT GYXM 30
XT CIRCUIT --108
26 X-017S XA143S
28 X-017R XA143R
P FILTER --302
RDRA GYYP 33
XT CIRCUIT --109
37 XA041S XA144S
35 XA041R XA144R
RDRD GYYM 36
XT CIRCUIT --110
34 XA042S XA145S
38 XA042R XA145R
RDXD GYZP 43
XT CIRCUIT --111
45 XA043S XA146S
41 XA043R XA146R
RDYD GYZM 46
XT CIRCUIT --112
42 XA044S XA147S
44 XA044R XA147R
P FILTER --303
RDZD GYRST 49
XT CIRCUIT --113
53 XA045S XC148S
51 XA045R XC148R
RDHA PS7A 52
XT CIRCUIT --114
50 XA046S XC149S
54 XA046R XC149R
RDBS PS7B 59
XT CIRCUIT --115
61 XA047S XC150S
57 XA047R XC150R
RDRST PS5A 62
XT CIRCUIT --116
58 XC048S XC151S
60 XC048R XC151R
P FILTER --304
RDCAR PS5B 65
XT CIRCUIT --117
69 XC050S XC152S
67 XC050R XC152R
ENCAR1 PS2A 68
XT CIRCUIT --118
66 XC054S XC153S
70 XC054R XC153R
PRSYNC PS2B 75
XT CIRCUIT --119
77 20119S XC154S
73 20119R XC154R
PPINT PS3A 78
XT CIRCUIT --120
74 XC139S XC155S
76 XC139R XC155R
P FILTER --305
PPSWCH PSCAR 81
XT CIRCUIT --121
85 XC140S XC156S
83 XC140R XC156R
(N.C.) OPXP 84
XT CIRCUIT --122
82 XA056S XA114S
86 XA056R XA114R
(N.C.) OPXM 91
XT CIRCUIT --123
93 XA057S XA115S
89 XA057R XA115R
OPYP OPYM 94
XT CIRCUIT --124
90 XA116S XA117S
92 XA116R XA117R
P FILTER --306
G1
G2
K1 KEY 1 07
K NETWORK --201
K2 KEY 2 15
K NETWORK --202
K3 KEY 3 23
K NETWORK --203
K4 KEY 4 24
K NETWORK --204
K5 KEY 5 31
K NETWORK --205
K6 KYRST1 39
K NETWORK --206
TRNSW KYRST2 55
K NETWORK --207
MARK ALTST 56
K NETWORK --208
MKRST LTRST 63
K NETWORK --209
ZOPT CIVC27 71
K NETWORK --210
SXTON BLKUPL 79
K NETWORK --211
OPTMS2 (N.C.) 87
K NETWORK --212
OPTMS3 (N.C.) 88
K NETWORK --213
16
32
47
48
64
0 VDC
TO ALL POINTS "G1"
80
0 VDC
TO ALL POINTS "G2"
08
40
72
+13 VDC
TO ALL POINTS "R"

REFERENCE DRAWINGS:
1006009 XT TRANSFORMER OUTPUT CIRCUIT
1006088 INTERFACE CIRCUITS

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CIRCUIT NUMBERS FOR COMPUTER POSITION 20 ARE PREFIXED BY 72
   CIRCUIT NUMBERS FOR COMPUTER POSITION 40 ARE PREFIXED BY 74
3. UPPER SIGNAL NAME USED IN COMPUTER POSITION 20
   LOWER SIGNAL NAME USED IN COMPUTER POSITION 40
4. (N.C.) DENOTES NO CONNECTION WHEN MODULE USED IN POSITION INDICATED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

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INSTRUMENTATION LAB
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DRAWN DATE 10 JUL 63
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL 7-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A20 OR A40

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006535
SCALE —
WT
SHEET 1 OF 1

1006535 A

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

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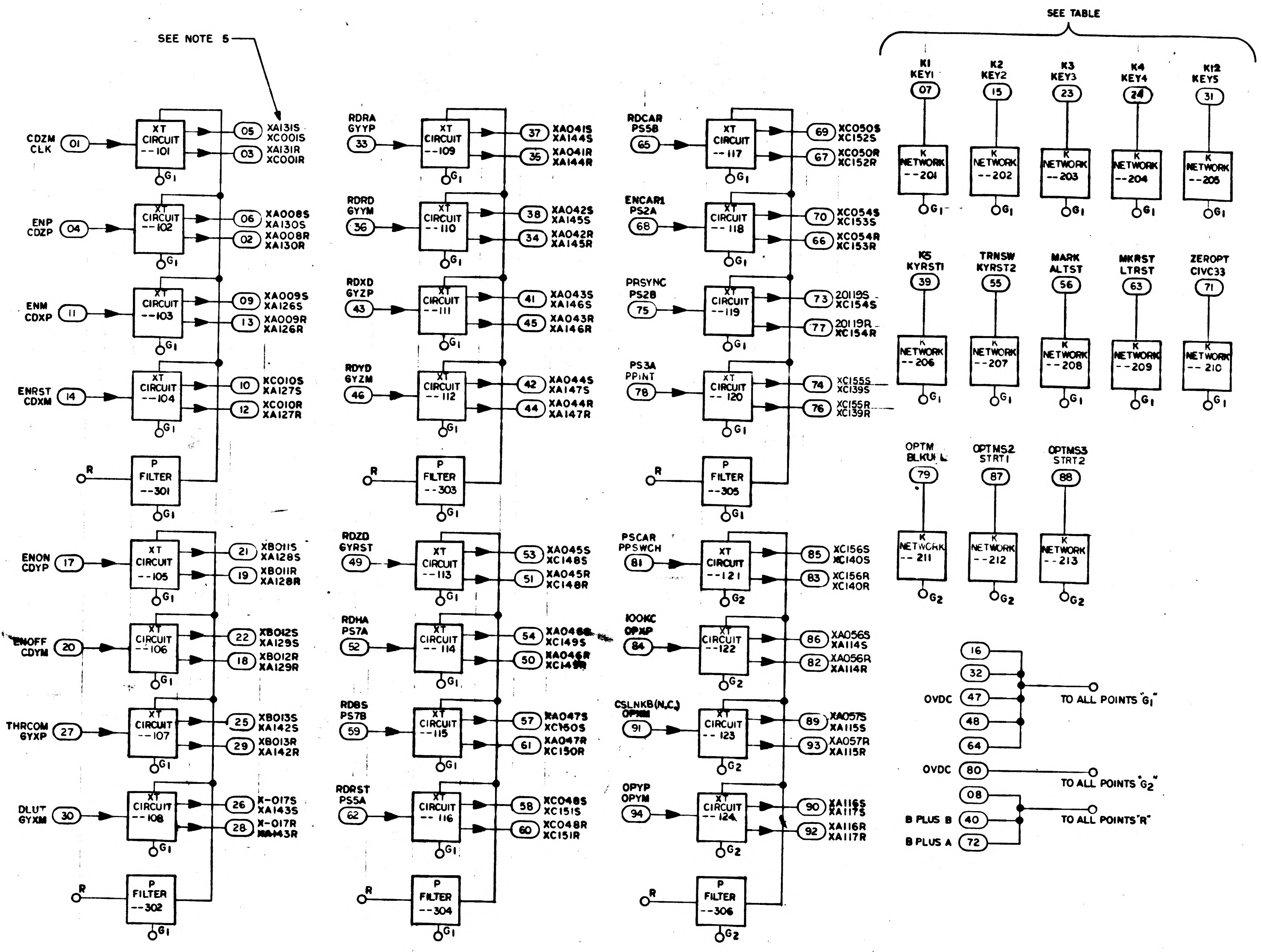
REVISIONS TDRR 12048

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02699	5 Aug 63	
B	REVISED PER TDRR 04153	10-21-63	
C	REVISED PER TDRR 05101	10 Dec 63	
D	REVISED PER TDRR 06019	24 Jan 64	
E	REVISED PER TDRR 06234	3/11/64	


SEE NOTE 5
CDZM CLK 01 → XT CIRCUIT --101 → 05 XA131S XC001S; 03 XA131R XC001R
ENP CDZP 04 → XT CIRCUIT --102 → 06 XA008S XA130S; 02 XA008R XA130R
ENM CDXP 11 → XT CIRCUIT --103 → 09 XA009S XA126S; 13 XA009R XA126R
ENRST CDXM 14 → XT CIRCUIT --104 → 10 XC010S XA127S; 12 XC010R XA127R
R → P FILTER --301
ENON CDYP 17 → XT CIRCUIT --105 → 21 XB011S XA128S; 19 XB011R XA128R
ENOFF CDYM 20 → XT CIRCUIT --106 → 22 XB012S XA129S; 18 XB012R XA129R
THRCOM GYXP 27 → XT CIRCUIT --107 → 25 XB013S XA142S; 29 XB013R XA142R
DLUT GYXM 30 → XT CIRCUIT --108 → 26 X-017S XA143S; 28 X-017R XA143R
R → P FILTER --302
RDRA GYYP 33 → XT CIRCUIT --109 → 37 XA041S XA144S; 35 XA041R XA144R
RDRD GYYM 36 → XT CIRCUIT --110 → 38 XA042S XA145S; 34 XA042R XA145R
RDXD GYZP 43 → XT CIRCUIT --111 → 41 XA043S XA146S; 45 XA043R XA146R
RDYD GYZM 46 → XT CIRCUIT --112 → 42 XA044S XA147S; 44 XA044R XA147R
R → P FILTER --303
RDZD GYRST 49 → XT CIRCUIT --113 → 53 XA045S XC148S; 51 XA045R XC148R
RDHA PS7A 52 → XT CIRCUIT --114 → 54 XA046S XC149S; 50 XA046R XC149R
RDBS PS7B 59 → XT CIRCUIT --115 → 57 XA047S XC150S; 61 XA047R XC150R
RDRST PS5A 62 → XT CIRCUIT --116 → 58 XC048S XC151S; 60 XC048R XC151R
R → P FILTER --304
RDCAR PS5B 65 → XT CIRCUIT --117 → 69 XC050S XC152S; 67 XC050R XC152R
ENCAR1 PS2A 68 → XT CIRCUIT --118 → 70 XC054S XC153S; 66 XC054R XC153R
PRSYNC PS2B 75 → XT CIRCUIT --119 → 73 20119S XC154S; 77 20119R XC154R
PS3A PPINT 78 → XT CIRCUIT --120 → 74 XC155S XC139S; 76 XC155R XC139R
R → P FILTER --305
PSCAR PPSWCH 81 → XT CIRCUIT --121 → 85 XC156S XC140S; 83 XC156R XC140R
100KC OPXP 84 → XT CIRCUIT --122 → 86 XA056S XA114S; 82 XA056R XA114R
CSLNKB(N.C.) OPXM 91 → XT CIRCUIT --123 → 89 XA057S XA115S; 93 XA057R XA115R
OPYP OPYM 94 → XT CIRCUIT --124 → 90 XA116S XA117S; 92 XA116R XA117R
R → P FILTER --306
G1
G2
SEE TABLE
K1 KEY1 07 → K NETWORK --201
K2 KEY2 15 → K NETWORK --202
K3 KEY3 23 → K NETWORK --203
K4 KEY4 24 → K NETWORK --204
K12 KEY5 31 → K NETWORK --205
K5 KYRST1 39 → K NETWORK --206
TRNSW KYRST2 55 → K NETWORK --207
MARK ALTST 56 → K NETWORK --208
MKRST LTRST 63 → K NETWORK --209
ZEROPT CIVC33 71 → K NETWORK --210
OPTM BLKUPL 79 → K NETWORK --211
OPTMS2 STRT1 87 → K NETWORK --212
OPTMS3 STRT2 88 → K NETWORK --213
16
32
OVDC 47
48
64
TO ALL POINTS "G1"
OVDC 80
TO ALL POINTS "G2"
08
B PLUS B 40
B PLUS A 72
TO ALL POINTS "R"

TABLE

PIN NO.	SIGNAL NAME	CIRCUIT SIGNAL NO.
07	K1	KE158
	KEY1	KE201
15	K2	KE159
	KEY2	KE202
23	K3	KE160
	KEY3	KE203
24	K4	KE161
	KEY4	KE204
31	K12	KE162
	KEY5	KE205
39	K5	KE163
	KYRST1	K-209
55	TRNSW	KE164
	KYRST2	K-206
56	MARK	KE102
	ALTST	K-207
63	MKRST	K-103
	LTRST	K-208
71	ZEROPT	KE104
	CIVC33	KE210
79	OPTMS1	KE105
	BLKUPL	KE246
87	OPTMS2	KE106
	STRT1	
88	OPTMS3	KE107
	STRT2	

REFERENCE DRAWINGS:
1006009 XT TRANSFORMER OUTPUT CIRCUIT
1006088 INTERFACE CIRCUITS

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CIRCUIT NUMBERS FOR COMPUTER POSITION 20 ARE PREFIXED BY 72
   CIRCUIT NUMBERS FOR COMPUTER POSITION 40 ARE PREFIXED BY 74
3. UPPER SIGNAL NAME USED IN COMPUTER POSITION 20
   LOWER SIGNAL NAME USED IN COMPUTER POSITION 40
4. (N.C.) DENOTES NO CONNECTION WHEN MODULE USED IN POSITION INDICATED
5. SIGNAL NAMES ARE DEFINED ON THE INTERFACE DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
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FINAL FINISH —

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DWG. NO. CONTRACT
DRAWN DATE 10 JUL 63
CHECKED
APPROVAL W. F. Turner 7/16/63
APPROVAL E. C. Hall by
NASA APPROVAL W. J. Rhine 7-17-63
MIT APPROVAL 2/17/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A20 OR A40

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006535
SCALE — WT SHEET 1 OF 1

1006535 E

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 12048			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02699	8/2/63	
B	REVISED PER TDRR 04158	10-25-65	
C	REVISED PER TDRR 05101	10 DEC 63	

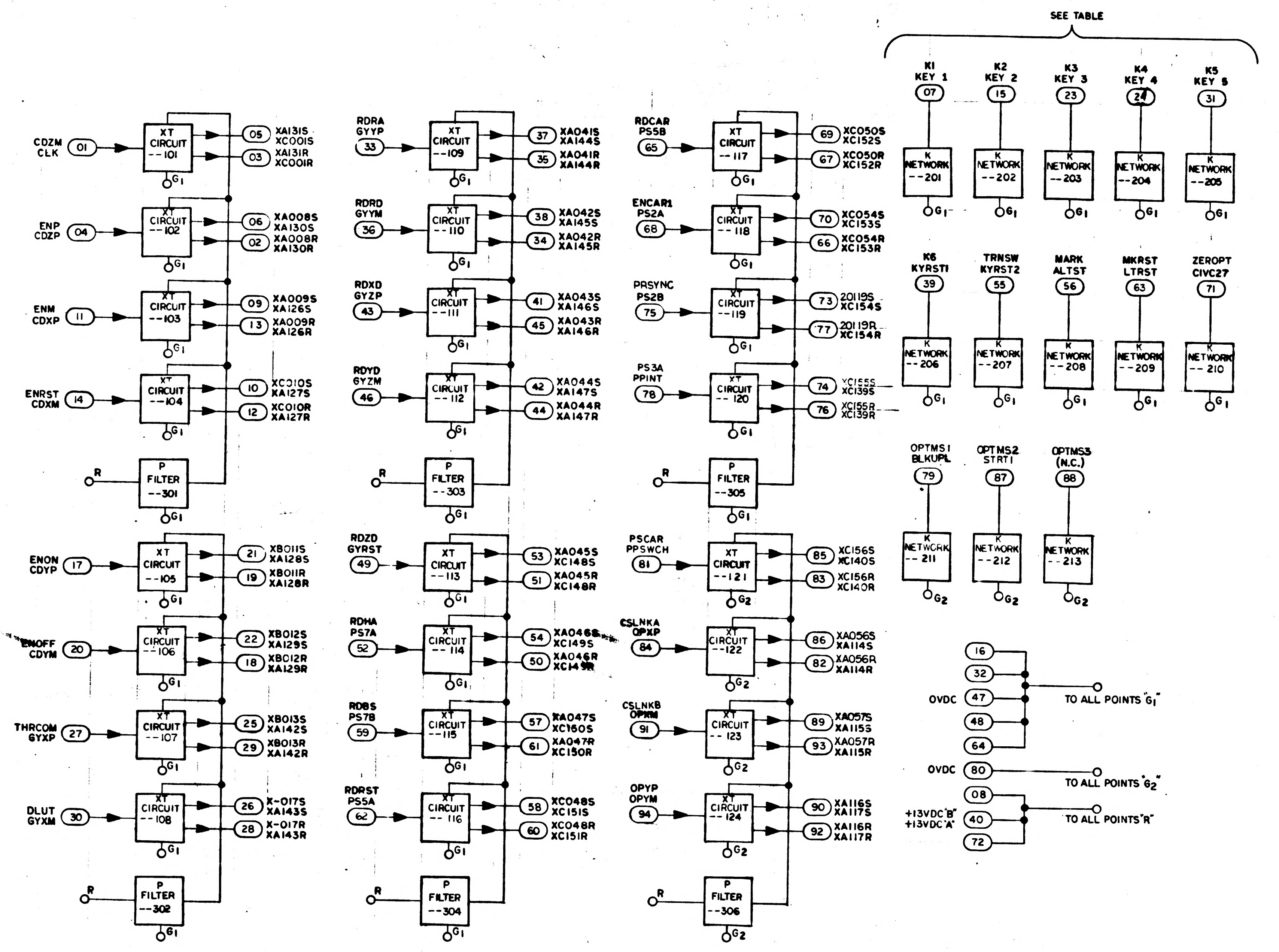
SEE TABLE
CDZM CLK 01
XT CIRCUIT --101
05 XA131S XC001S
03 XA131R XC001R
ENP CDZP 04
XT CIRCUIT --102
06 XA008S XA130S
02 XA008R XA130R
ENM CDXP 11
XT CIRCUIT --103
09 XA009S XA126S
13 XA009R XA126R
ENRST CDXM 14
XT CIRCUIT --104
10 XC010S XA127S
12 XC010R XA127R
R
P FILTER --301
ENON CDYP 17
XT CIRCUIT --105
21 XB011S XA128S
19 XB011R XA128R
ENOFF CDYM 20
XT CIRCUIT --106
22 XB012S XA129S
18 XB012R XA129R
THRCOM GYXP 27
XT CIRCUIT --107
25 XB013S XA142S
29 XB013R XA142R
DLUT GYXM 30
XT CIRCUIT --108
26 X-017S XA143S
28 X-017R XA143R
P FILTER --302
RDRA GYYP 33
XT CIRCUIT --109
37 XA041S XA144S
35 XA041R XA144R
RDRD GYYM 36
XT CIRCUIT --110
38 XA042S XA145S
34 XA042R XA145R
RDXD GYZP 43
XT CIRCUIT --111
41 XA043S XA146S
45 XA043R XA146R
RDYD GYZM 46
XT CIRCUIT --112
42 XA044S XA147S
44 XA044R XA147R
P FILTER --303
RDZD GYRST 49
XT CIRCUIT --113
53 XA045S XC148S
51 XA045R XC148R
RDHA PS7A 52
XT CIRCUIT --114
54 XA046S XC149S
50 XA046R XC149R
RDBS PS7B 59
XT CIRCUIT --115
57 XA047S XC150S
61 XA047R XC150R
RDRST PS5A 62
XT CIRCUIT --116
58 XC048S XC151S
60 XC048R XC151R
P FILTER --304
RDCAR PS5B 65
XT CIRCUIT --117
69 XC050S XC152S
67 XC050R XC152R
ENCAR1 PS2A 68
XT CIRCUIT --118
70 XC054S XC153S
66 XC054R XC153R
PRSYNC PS2B 75
XT CIRCUIT --119
73 20119S XC154S
77 20119R XC154R
PS3A PPINT 78
XT CIRCUIT --120
74 XC155S XC139S
76 XC155R XC139R
P FILTER --305
PSCAR PPSWCH 81
XT CIRCUIT --121
85 XC156S XC140S
83 XC156R XC140R
CSLNKA OPXP 84
XT CIRCUIT --122
86 XA056S XA114S
82 XA056R XA114R
CSLNKB OPXM 91
XT CIRCUIT --123
89 XA057S XA115S
93 XA057R XA115R
OPYP OPYM 94
XT CIRCUIT --124
90 XA116S XA117S
92 XA116R XA117R
P FILTER --306
G1
G2
K1 KEY 1 07
K NETWORK --201
K2 KEY 2 15
K NETWORK --202
K3 KEY 3 23
K NETWORK --203
K4 KEY 4 24
K NETWORK --204
K5 KEY 5 31
K NETWORK --205
K6 KYRST1 39
K NETWORK --206
TRNSW KYRST2 55
K NETWORK --207
MARK ALTST 56
K NETWORK --208
MKRST LTRST 63
K NETWORK --209
ZEROPT CIVC27 71
K NETWORK --210
OPTMS1 BLKUPL 79
K NETWORK --211
OPTMS2 STRT1 87
K NETWORK --212
OPTMS3 (N.C.) 88
K NETWORK --213
16
32
OVDC 47
48
64
TO ALL POINTS "G1"
OVDC 80
TO ALL POINTS "G2"
08
+13VDC "B" +13VDC "A" 40
72
TO ALL POINTS "R"

TABLE		
PIN NO.	SIGNAL NAME	CIRCUIT SIGNAL NO.
07	K1	KE158
	KEY 1	KE201
15	K2	KE159
	KEY 2	KE202
23	K3	KE160
	KEY3	KE203
24	K4	KE161
	KEY4	KE204
31	K5	KE162
	KEY5	KE205
39	K6	KE163
	KYRST1	K-209
55	TRNSW	KE164
	KYRST2	K-206
56	MARK	KE102
	ALTST	K-207
63	MKRST	K-103
	LTRST	K-208
71	ZOPT	KE104
	CIVC27	KE210
79	OPTMS1	KE105
	BLKUPL	KE246
87	OPTMS2	KE106
	STRT1	
88	OPTMS3	KE107
	(N.C.)	

REFERENCE DRAWINGS:
1006009 XT TRANSFORMER OUTPUT CIRCUIT
1006088 INTERFACE CIRCUITS

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CIRCUIT NUMBERS FOR COMPUTER POSITION 20 ARE PREFIXED BY 72
   CIRCUIT NUMBERS FOR COMPUTER POSITION 40 ARE PREFIXED BY 74
3. UPPER SIGNAL NAME USED IN COMPUTER POSITION 20
   LOWER SIGNAL NAME USED IN COMPUTER POSITION 40
4. (N.C.) DENOTES NO CONNECTION WHEN MODULE USED IN POSITION INDICATED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO.
CONTRACT
DRAWN DATE 10 JUL 63
CHECKED
APPROVAL 7/16/63
APPROVAL
NASA APPROVAL 7-17-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A20 OR A40

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006535
SCALE —
WT
SHEET 1 OF 1

1006535 C

MASTER

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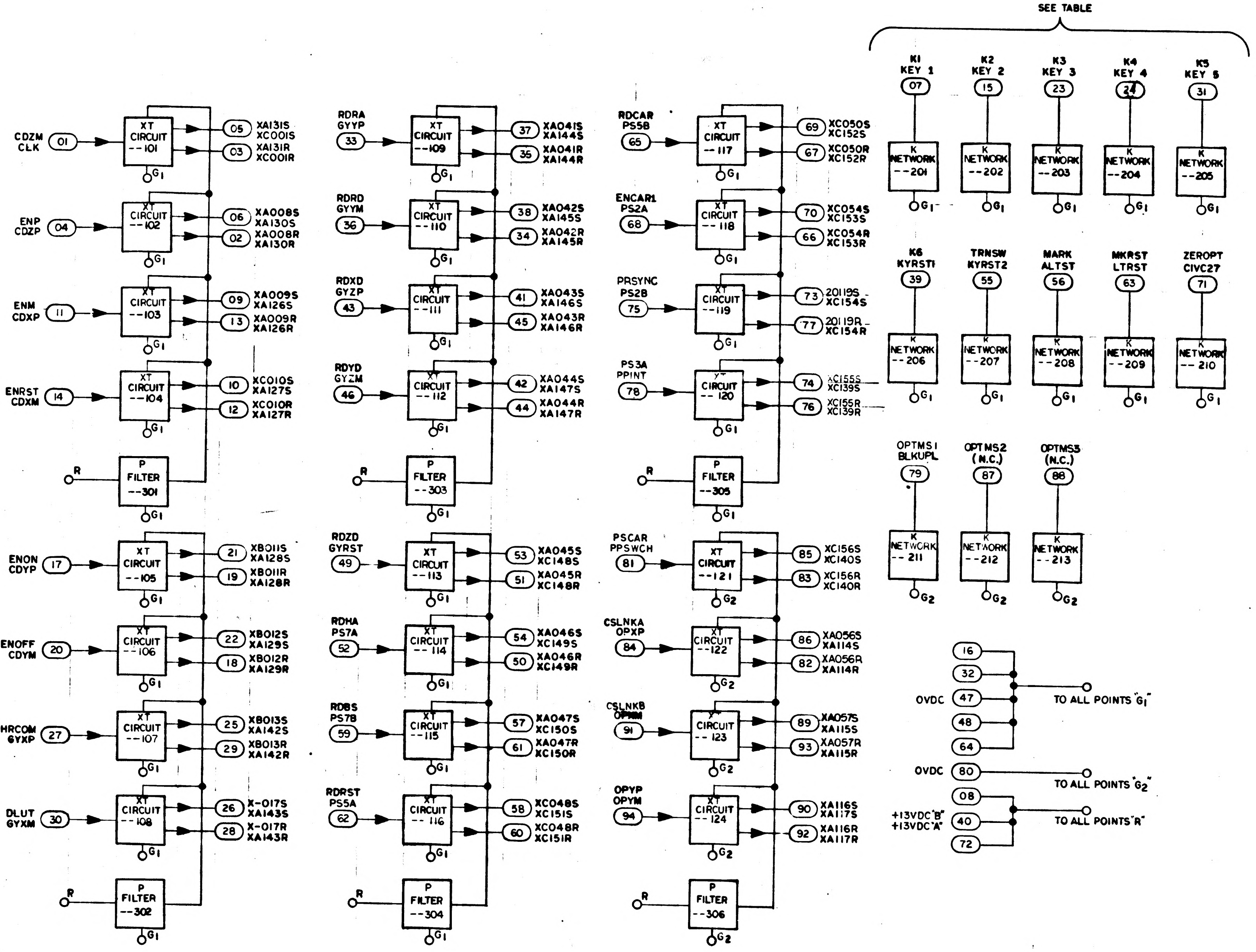
REVISIONS TDRR 12048			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02699	8/21/63	
B	REVISED PER TDRR 04158	10-25-63	


SEE TABLE
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XT CIRCUIT --101
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12 XC010R XA127R
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XT CIRCUIT --105
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19 XB011R XA128R
ENOFF CDYM 20
XT CIRCUIT --106
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18 XB012R XA129R
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P FILTER --302
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XT CIRCUIT --109
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35 XA041R XA144R
RDRD GYYM 36
XT CIRCUIT --110
38 XA042S XA145S
34 XA042R XA145R
RDXD GYZP 43
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45 XA043R XA146R
RDYD GYZM 46
XT CIRCUIT --112
42 XA044S XA147S
44 XA044R XA147R
P FILTER --303
RDZD GYRST 49
XT CIRCUIT --113
53 XA045S XC148S
51 XA045R XC148R
RDHA PS7A 52
XT CIRCUIT --114
54 XA046S XC149S
50 XA046R XC149R
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61 XA047R XC150R
RDRST PS5A 62
XT CIRCUIT --116
58 XC048S XC151S
60 XC048R XC151R
P FILTER --304
RDCAR PS5B 65
XT CIRCUIT --117
69 XC050S XC152S
67 XC050R XC152R
ENCAR1 PS2A 68
XT CIRCUIT --118
70 XC054S XC153S
66 XC054R XC153R
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73 20119S XC154S
77 20119R XC154R
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76 XC155R XC139R
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XT CIRCUIT --121
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83 XC156R XC140R
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XT CIRCUIT --122
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93 XA057R XA115R
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K4 KEY 4 24
K NETWORK --204
K5 KEY 5 31
K NETWORK --205
K6 KYRST1 39
K NETWORK --206
TRNSW KYRST2 55
K NETWORK --207
MARK ALTST 56
K NETWORK --208
MKRST LTRST 63
K NETWORK --209
ZEROPT CIVC27 71
K NETWORK --210
OPTMS1 BLKUPL 79
K NETWORK --211
OPTMS2 (N.C.) 87
K NETWORK --212
OPTMS3 (N.C.) 88
K NETWORK --213
G1
G2
16
32
OVDC 47
48
64
TO ALL POINTS "G1"
OVDC 80
TO ALL POINTS "G2"
08
+13VDC "B" +13VDC "A" 40
72
TO ALL POINTS "R"

TABLE		
PIN NO.	SIGNAL NAME	CIRCUIT SIGNAL NO.
07	K1	KE158
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	KEY3	KE203
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	KEY4	KE204
31	K5	KE162
	KEY5	KE205
39	K6	KE163
	KYRST1	K-209
55	TRNSW	KE164
	KYRST2	K-206
56	MARK	KE102
	ALTST	K-207
63	MKRST	K-103
	LTRST	K-208
71	ZOPT	KE104
	CIVC27	KE210
79	OPTMS1	KE105
	BLKUPL	KE246
87	OPTMS2	KE106
	(N.C.)	
88	OPTMS3	KE107
	(N.C.)	

REFERENCE DRAWINGS:
1006009 XT TRANSFORMER OUTPUT CIRCUIT
1006088 INTERFACE CIRCUITS

NOTES

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2. CIRCUIT NUMBERS FOR COMPUTER POSITION 20 ARE PREFIXED BY 72
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   LOWER SIGNAL NAME USED IN COMPUTER POSITION 40
4. (N.C.) DENOTES NO CONNECTION WHEN MODULE USED IN POSITION INDICATED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

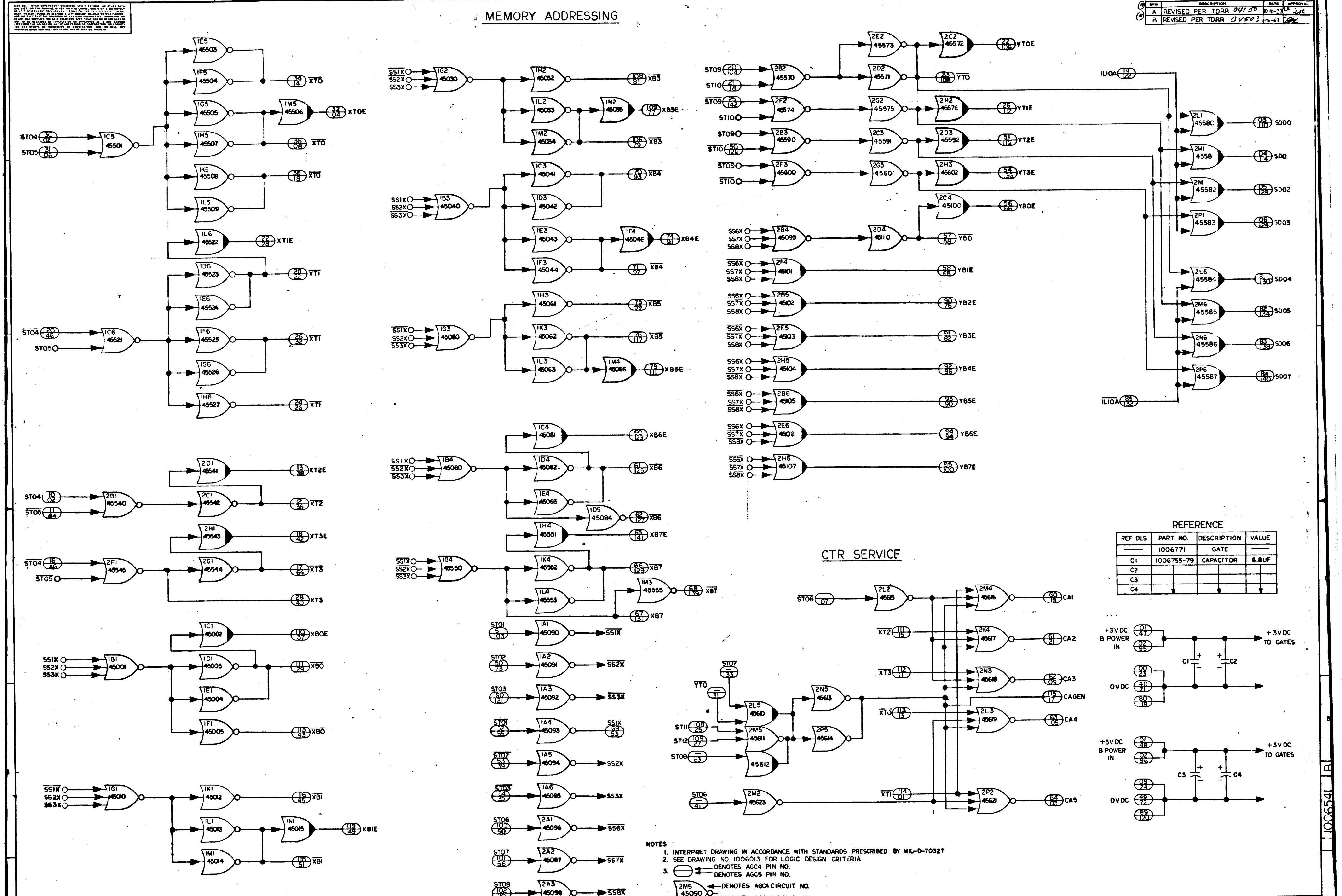
MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO. CONTRACT
DRAWN DATE 10 JUL 63
CHECKED
APPROVAL 7/16/63
APPROVAL
NASA APPROVAL 7-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLOW DIAGRAM
INTERFACE MODULE
A20 OR A40

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006535
SCALE —
WT
SHEET 1 OF 1

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 04150	10-18-23	LK
B	REVISED PER TDRR 04503	-63	



REFERENCE

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2			
C3			
C4	↓	↓	↓

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.

2M5 45090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN DATE 5-29-63
CHECKED 6 Aug 63
APPROVAL 6 Aug 63
APPROVAL 8/6/63
NASA APPROVAL 8/7/63
MIT APPROVAL George J. Nukan 8/7/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

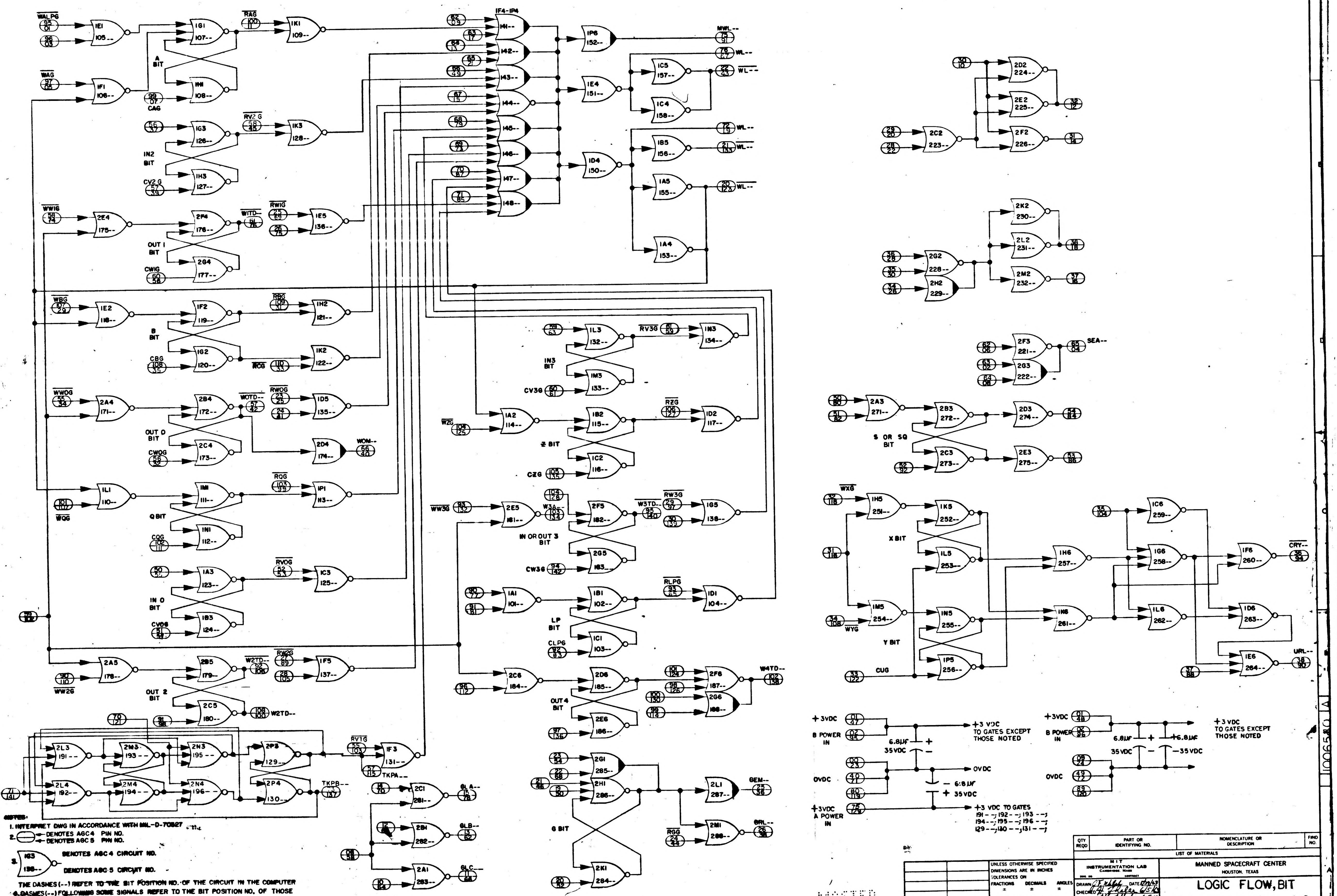
LOGIC FLOW "A"
LOGIC MODULE NO. A35

CODE IDENT NO. —
SIZE E
NASA DRAWING NO 1006541
SCALE NONE
WT
SHEET 1 OF 1

1006541 B

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS TDRR 01461			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03613	10-2-63	



WALPG
WAG
RAG
CAG
A BIT
RV2G
IN2 BIT
CV2G
WWIG
WITD--
RWIG
OUT 1 BIT
CWIG
WBG
RBG
B BIT
CBG
RCG
WWOG
WOTD--
RWOG
OUT 0 BIT
CWOG
WOM--
RQG
Q BIT
WQG
CQG
RVOG
IN 0 BIT
CVOG
W2TD--
RW2G
OUT 2 BIT
WW2G
RVTG
TKPA--
TKPB--
IF4-IP4
MWL--
WL--
RV3G
IN3 BIT
CV3G
WZG
RZG
Z BIT
CZG
WW3G
W3TD--
RW3G
W3A--
IN OR OUT 3 BIT
CW3G
RLPG
LP BIT
CLPG
OUT4 BIT
W4TD--
GEM--
G BIT
RGG
GLA--
GLB--
GLC--
GRL--
SEA--
S OR SQ BIT
WXG
X BIT
WYG
Y BIT
CUG
CRY--
URL--
+3VDC B POWER IN
+3 VDC TO GATES EXCEPT THOSE NOTED
6.8UF 35VDC
OVDC
- 6.8UF + 35VDC
+3VDC A POWER IN
+3 VDC TO GATES 191--; 192--; 193--; 194--; 195--; 196--; 129--; 130--; 131--;
+3VDC B POWER IN
6.8UF 35VDC
-35VDC
+3 VDC TO GATES EXCEPT THOSE NOTED
MASTER

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH MIL-D-70327
2. DENOTES AGC4 PIN NO.
   DENOTES AGC 5 PIN NO.
3. 1B3 DENOTES AGC 4 CIRCUIT NO.
   136-- DENOTES AGC 5 CIRCUIT NO.
   THE DASHES (--) REFER TO THE BIT POSITION NO. OF THE CIRCUIT IN THE COMPUTER
4. DASHES (--) FOLLOWING SOME SIGNALS REFER TO THE BIT POSITION NO. OF THOSE SIGNALS AS USED IN THE COMPUTER
5. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN C.F. Wolf DATE 5/29/63
CHECKED H. Thaler 6/5/63
APPROVAL Albert Hopkins 6-5-63
APPROVAL Eldon C Hall 6-5-63
NASA APPROVAL W J R 6-5-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW, BIT LOGIC MODULE NO. A1 - A16

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006540
SCALE
WT
SHEET 1 OF 1

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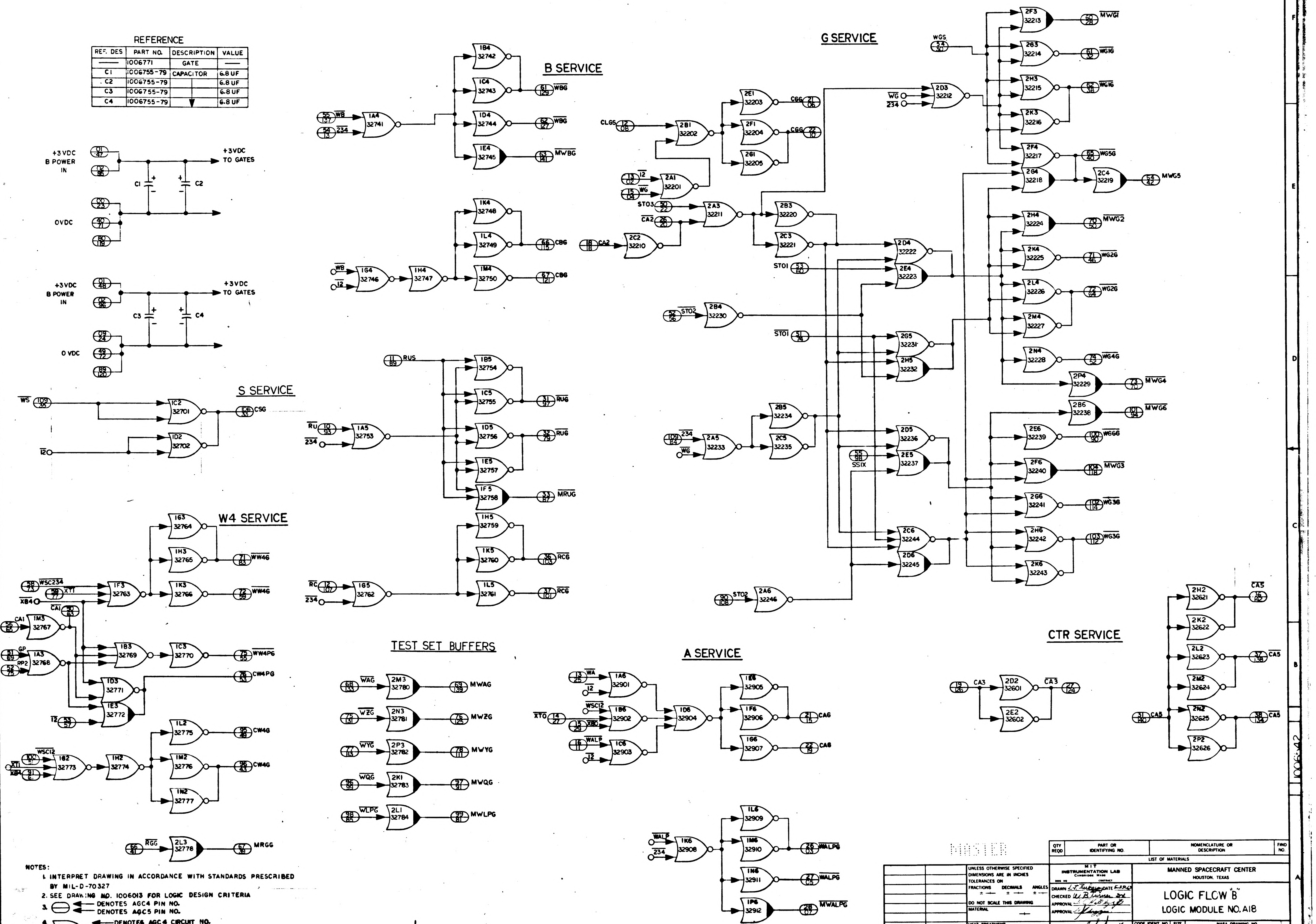
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL

REFERENCE

REF. DES	PART NO.	DESCRIPTION	VALUE
——	1006771	GATE	——
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF



+3VDC B POWER IN
+3VDC TO GATES
0VDC
0 VDC
C1
C2
C3
C4
B SERVICE
1A4 32741
1B4 32742
1C4 32743
1D4 32744
1E4 32745
WB
234
WBG
MWBG
1G4 32746
1H4 32747
1K4 32748
1L4 32749
1M4 32750
CBG
S SERVICE
WS
1C2 32701
1D2 32702
CSG
RUS
RU
1A5 32753
1B5 32754
1C5 32755
1D5 32756
1E5 32757
1F5 32758
RUG
MRUG
RC
1G5 32762
1H5 32759
1K5 32760
1L5 32761
RCG
W4 SERVICE
WSC234
XT1
XB4
CA1
GP
RP2
1F3 32763
1G3 32764
1H3 32765
1K3 32766
1M3 32767
1A3 32768
1B3 32769
1C3 32770
1D3 32771
1E3 32772
WW4G
WW4PG
CW4PG
WSC12
1G2 32773
1H2 32774
1L2 32775
1M2 32776
1N2 32777
CW4G
RGG
2L3 32778
MRGG
TEST SET BUFFERS
WAG 2M3 32780 MWAG
WZG 2N3 32781 MWZG
WYG 2P3 32782 MWYG
WQG 2K1 32783 MWQG
WLPG 2L1 32784 MWLPG
G SERVICE
CLGS
2B1 32202
2A1 32201
2E1 32203
2F1 32204
2G1 32205
CGG
STO3
CA2
2A3 32211
2C2 32210
2B3 32220
2C3 32221
2D3 32212
WGS
WG
2F3 32213
2G3 32214
2H3 32215
2K3 32216
2F4 32217
2G4 32218
2C4 32219
MWG1
WG1G
WG5G
MWG5
2D4 32222
2E4 32223
STO1
2B4 32230
STO2
2G5 32231
2H5 32232
2H4 32224
2K4 32225
2L4 32226
2M4 32227
2N4 32228
2P4 32229
MWG2
WG2G
WG4G
MWG4
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2A5 32233
2C5 32235
2D5 32236
2E5 32237
SSIX
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2E6 32239
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MWG6
WG6G
MWG3
WG3G
A SERVICE
WA
WSC12
XTO
XB0
WALP
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1B6 32902
1C6 32903
1D6 32904
1E6 32905
1F6 32906
1G6 32907
CAG
1K6 32908
1L6 32909
1M6 32910
1N6 32911
1P6 32912
WALPG
MWALPG
CTR SERVICE
CA3
2D2 32601
2E2 32602
CA5
2H2 32621
2K2 32622
2L2 32623
2M2 32624
2N2 32625
2P2 32626

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 -- 090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT

DRAWN L.T. Burke DATE 5-2-63
CHECKED W. B. Turner
APPROVAL
APPROVAL
NASA APPROVAL 7/2/63
MIT APPROVAL E Hall 7/2/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "B"
LOGIC MODULE NO. A18

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006542
SCALE —
WT
SHEET OF

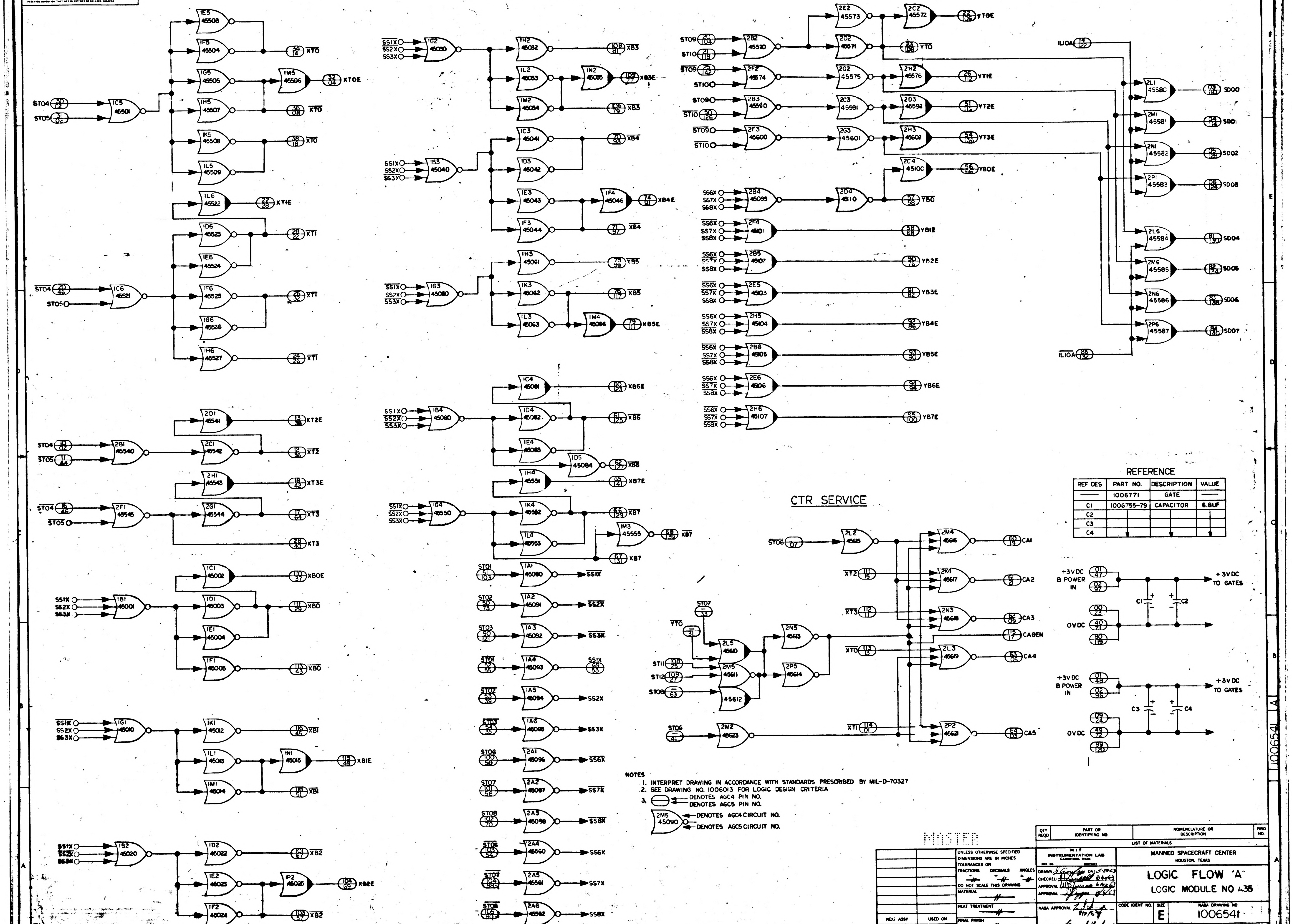
1006542

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 02399

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 04150	10-18-23	LK


MEMORY ADDRESSING
CTR SERVICE
ST04
ST05
XT0
XT0E
XT1
XT1E
XT2
XT2E
XT3
XT3E
XB0
XB0E
XB1
XB1E
XB2
XB2E
XB3
XB3E
XB4
XB4E
XB5
XB5E
XB6
XB6E
XB7
XB7E
YT0
YT0E
YT1E
YT2E
YT3E
YB0
YB0E
YB1E
YB2E
YB3E
YB4E
YB5E
YB6E
YB7E
SD00
SD01
SD02
SD03
SD04
SD05
SD06
SD07
IL10A
CA1
CA2
CA3
CAGEN
CA4
CA5
+3VDC B POWER IN
+3VDC TO GATES
0VDC
C1
C2
C3
C4

REFERENCE

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
2M5 45090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS
DRAWN DATE 5-29-63
CHECKED 6 Aug 63
APPROVAL 6 Aug 63
APPROVAL 8/6/63
NASA APPROVAL 8/17/63
MIT APPROVAL George J. [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "A"
LOGIC MODULE NO 435

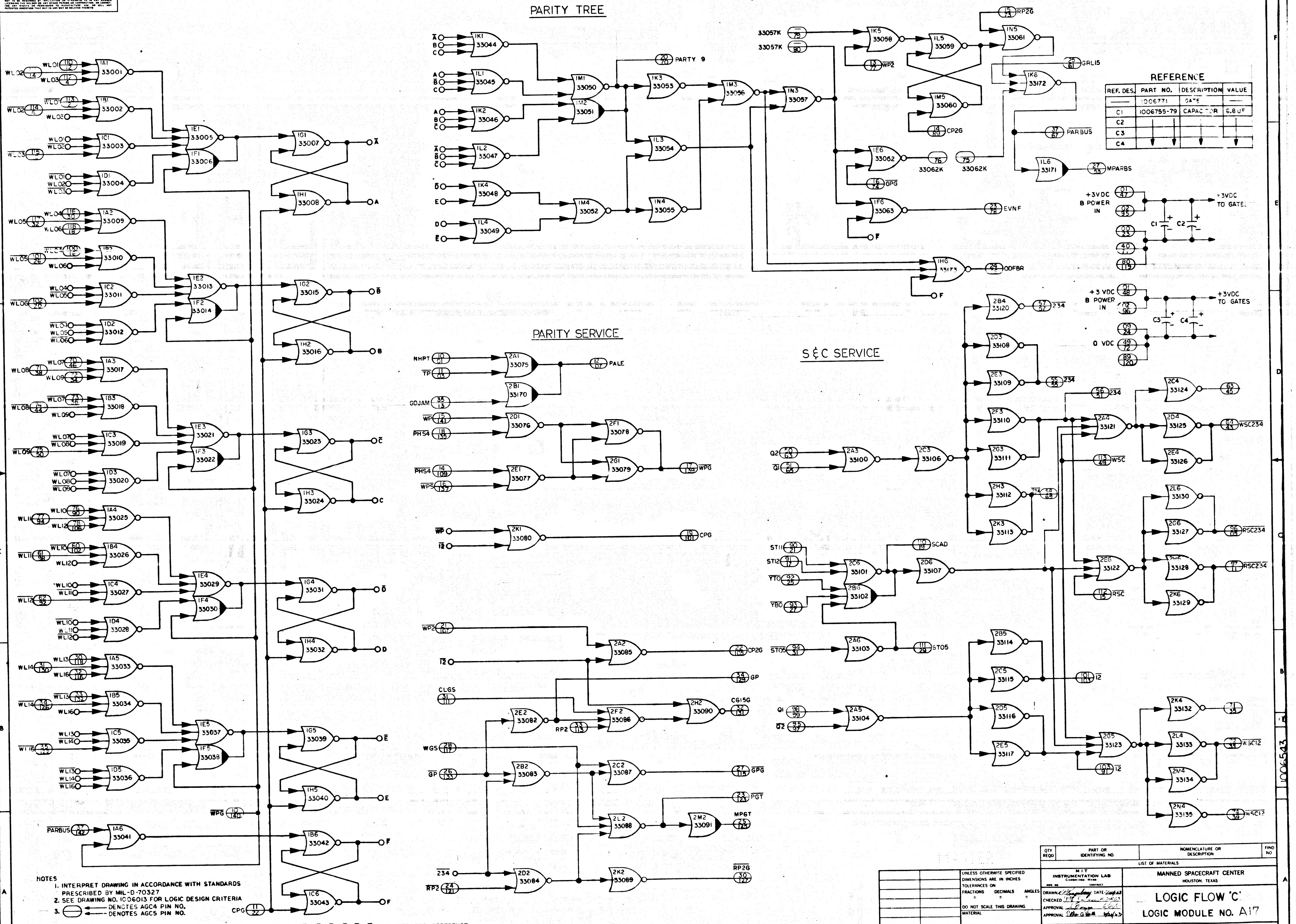
CODE IDENT NO. SIZE E NASA DRAWING NO. 1006541
SCALE NONE WT SHEET 1 OF 4

1006541 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS 01749

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02287	[illegible]	[illegible]
B	REVISED PER TDRR 03596	[illegible]	[illegible]



REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
5. 2M5 33090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.
6. SIGNAL NAMES A, $\overline{A}$, B, $\overline{B}$, C, $\overline{C}$, D, $\overline{D}$, E, $\overline{E}$, F, $\overline{F}$ ARE USED FOR REFERENCE ON THIS DRAWING ONLY AND ARE NOT TO BE USED IN COMPUTER LISTINGS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN R.P. Kingsbury DATE [illegible]
CHECKED [illegible] [illegible] JUN 63
APPROVAL [illegible] [illegible]
APPROVAL [illegible] 6/24/63
NASA APPROVAL W.G. [illegible] 6-26-63
MIT APPROVAL [illegible] 26 Jun 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

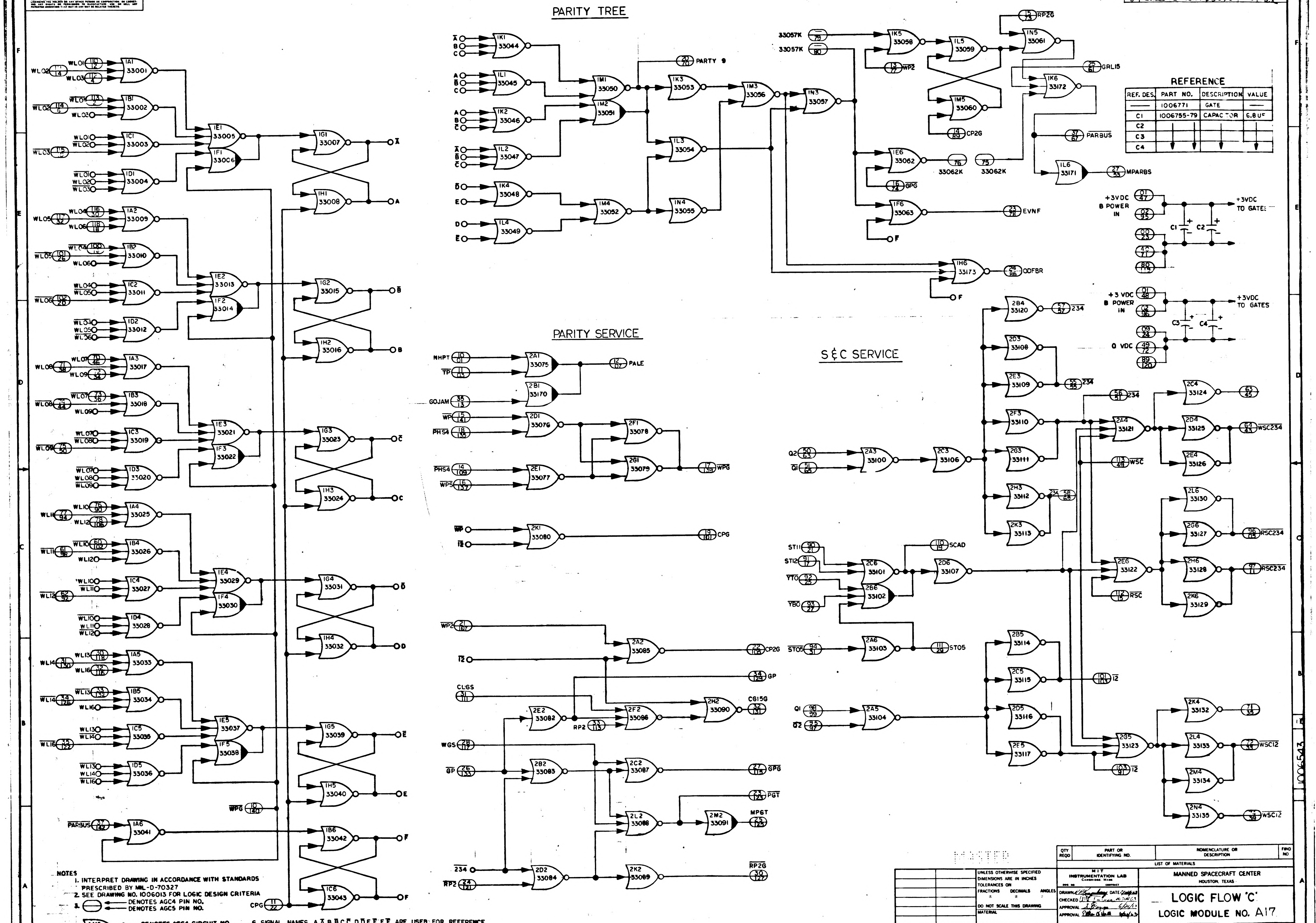
LOGIC FLOW 'C'
LOGIC MODULE NO. A17

CODE IDENT NO | SIZE E | NASA DRAWING NO 1006543
SCALE | WT | SHEET 1 OF 1

1006543

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 01749			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02287	7/26/63	
B	REVISED PER TDRR 03596	10-3-63	


PARITY TREE
PARITY SERVICE
S&C SERVICE
1A1 33001
1B1 33002
1C1 33003
1D1 33004
1E1 33005
1F1 33006
1G1 33007
1H1 33008
1A2 33009
1B2 33010
1C2 33011
1D2 33012
1E2 33013
1F2 33014
1G2 33015
1H2 33016
1A3 33017
1B3 33018
1C3 33019
1D3 33020
1E3 33021
1F3 33022
1G3 33023
1H3 33024
1A4 33025
1B4 33026
1C4 33027
1D4 33028
1E4 33029
1F4 33030
1G4 33031
1H4 33032
1A5 33033
1B5 33034
1C5 33035
1D5 33036
1E5 33037
1F5 33038
1G5 33039
1H5 33040
1A6 33041
1B6 33042
1C6 33043
1K1 33044
1L1 33045
1K2 33046
1L2 33047
1K4 33048
1L4 33049
1M1 33050
1M2 33051
1M4 33052
1K3 33053
1L3 33054
1N4 33055
1M3 33056
1N3 33057
1K5 33058
1L5 33059
1M5 33060
1N5 33061
1E6 33062
1F6 33063
1L6 33171
1K6 33172
1H6 33173
2A1 33075
2B1 33170
2D1 33076
2E1 33077
2F1 33078
2G1 33079
2K1 33080
2A2 33085
2E2 33082
2F2 33086
2H2 33090
2B2 33083
2C2 33087
2L2 33088
2M2 33091
2D2 33084
2K2 33089
2B4 33120
2D3 33108
2E3 33109
2F3 33110
2G3 33111
2H3 33112
2K3 33113
2A3 33100
2C3 33106
2A4 33121
2C4 33124
2D4 33125
2E4 33126
2L6 33130
2G6 33127
2H6 33128
2K6 33129
2E6 33122
2C6 33101
2B6 33102
2D6 33107
2A6 33103
2B5 33114
2C5 33115
2D5 33116
2E5 33117
2A5 33104
2G5 33123
2K4 33132
2L4 33133
2M4 33134
2N4 33135
PARTY 9
RP2G
GRL15
WP2
CP2G
PARBUS
MPARBS
GPG
EVNF
CODFBR
33057K
33062K
PALE
WPG
CPG
GP
CG15G
PGT
MPGT
GOJAM
NHPT
TP
PHS4
WP
CLGS
WGS
RP2
SCAD
STO5
ST11
ST12
Q2
Q1
WSC234
RSC234
RSC
WSC
WSC12
234
12
+3VDC B POWER IN
+3VDC TO GATES
+3 VDC B POWER IN
0 VDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO.
← DENOTES AGC5 PIN NO.
5. 2M5 33090 ← DENOTES AGC4 CIRCUIT NO.
← DENOTES AGC5 CIRCUIT NO.
6. SIGNAL NAMES A, $\overline{A}$, B, $\overline{B}$, C, $\overline{C}$, D, $\overline{D}$, E, $\overline{E}$, F, $\overline{F}$ ARE USED FOR REFERENCE ON THIS DRAWING ONLY AND ARE NOT TO BE USED IN COMPUTER LISTINGS

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN R P Kingsbury DATE 6/18/63
CHECKED 26 JUN 63
APPROVAL 6/26/63
APPROVAL 6/26/63
NASA APPROVAL W J Rhine 6-26-63
MIT APPROVAL 26 Jun 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

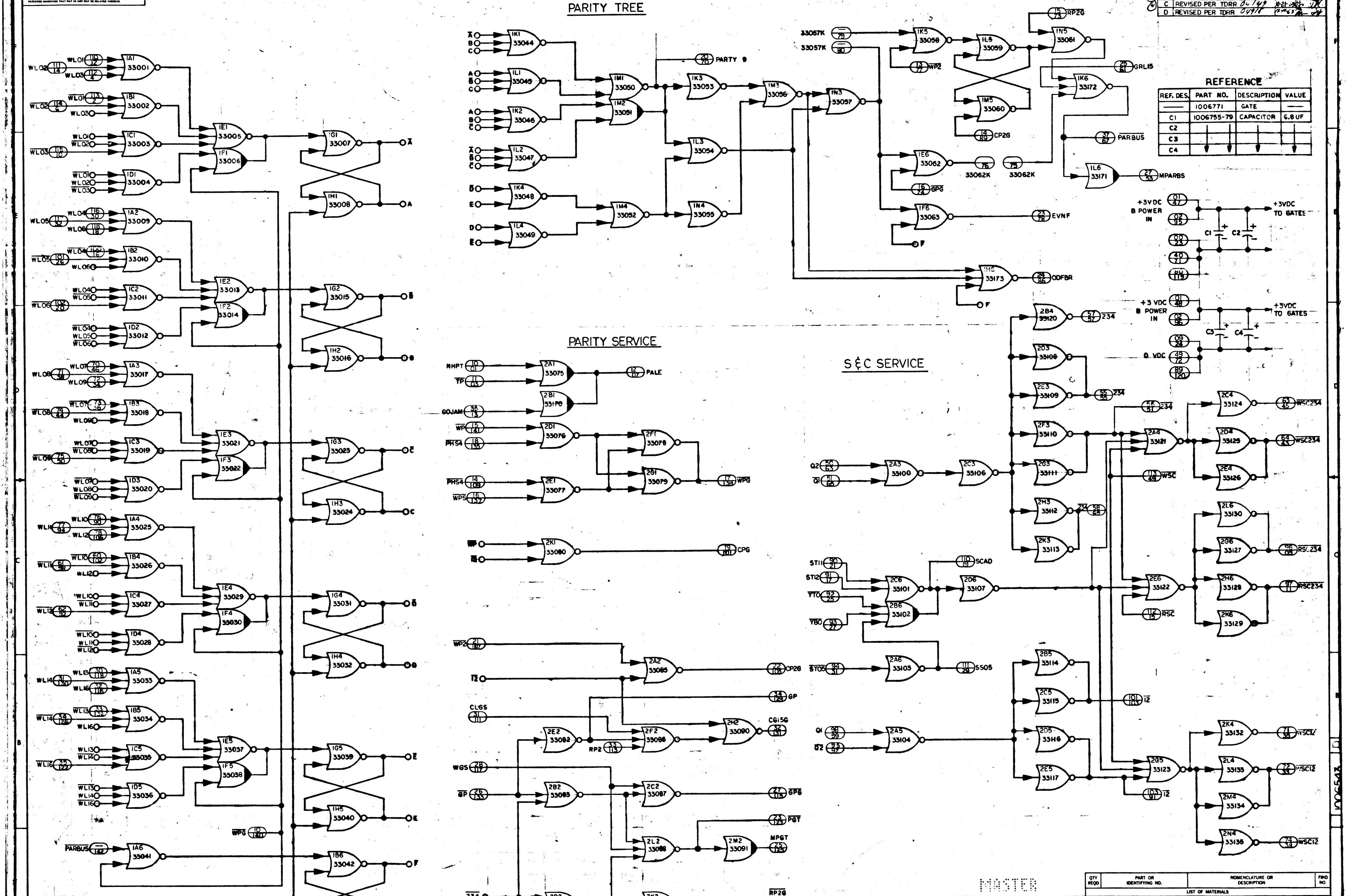
LOGIC FLOW 'C'
LOGIC MODULE NO. A17

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006543
SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 01749

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02287	7/26/63	[illegible]
B	REVISED PER TDRR 03576	10-3-63	[illegible]
C	REVISED PER TDRR 04149	10-21-63	[illegible]
D	REVISED PER TDRR 04916	12-10-63	[illegible]


PARITY TREE
PARITY SERVICE
S&C SERVICE
PARTY 9
RP2G
GRL15
PARBUS
MPARBS
EVNF
ODFBR
PALE
WPG
CPG
CP2G
GP
CGI5G
GPG
PGT
MPGT
RP2G
SCAD
SS05
WSC
RSC
WSC234
RSC234
WSC12
+3VDC B POWER IN
+3VDC TO GATES
0 VDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
5. 2M5 33090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.
6. SIGNAL NAMES A, Ā, B, B̄, C, C̄, D, D̄, E, Ē, F, F̄ ARE USED FOR REFERENCE ON THIS DRAWING ONLY AND ARE NOT TO BE USED IN COMPUTER LISTINGS

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE [illegible]
CHECKED [illegible] 26 JUN 63
APPROVAL [illegible] 6/26/63
APPROVAL [illegible]
NASA APPROVAL W. Q. [illegible] 6-26-63
MIT APPROVAL [illegible]

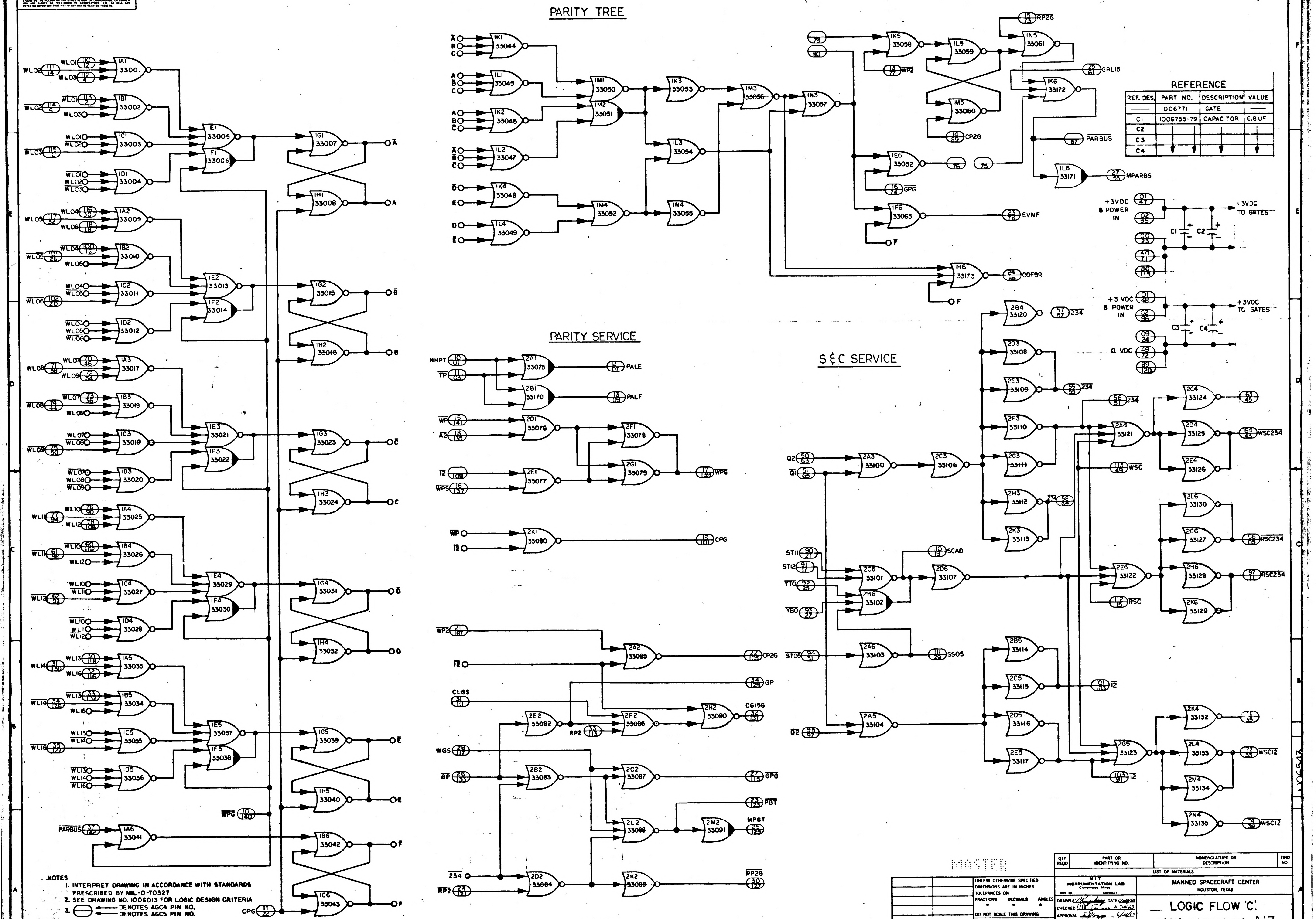
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'C'.
LOGIC MODULE NO. A17.

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006543
SCALE
WT
SHEET 1 OF 8

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 01749			
SYM	DESCRIPTION	DATE	APPROVAL



REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 33090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN R.P. Kangenberg DATE 6/14/63
CHECKED W.E. Turner 26 JUN 63
APPROVAL E. Morgan 6/26/63
APPROVAL Eldon C. Hall 6/26/63
NASA APPROVAL W.Q. Rhine 6-26-63
MIT APPROVAL W. Kupfer 26 Jun 63

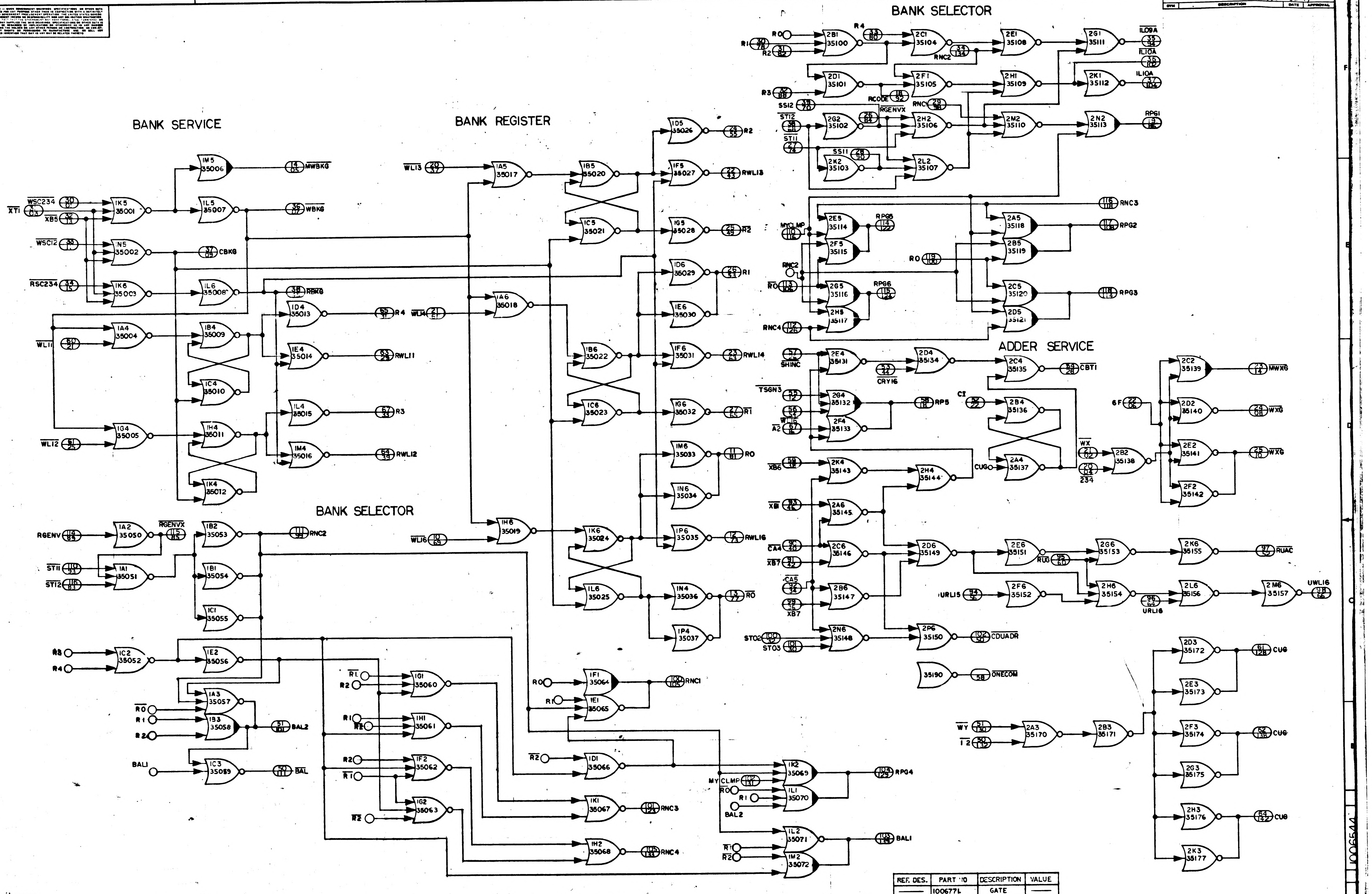
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'C'
LOGIC MODULE NO. A17

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006543
SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 02674			
SYM	DESCRIPTION	DATE	APPROVAL


BANK SELECTOR
BANK SERVICE
BANK REGISTER
BANK SELECTOR
ADDER SERVICE
WSC234
XT1
XB5
WSC12
RSC234
WL11
WL12
WL13
WL14
WL16
MWBKG
WBKG
CBKG
RBKG
R4
RWL11
R3
RWL12
R2
RWL13
R1
RWL14
RO
RWL16
RGENV
RGENVX
ST11
ST12
RNC2
BAL2
BAL
BAL1
RNC1
RNC3
RNC4
RPG4
RPG1
RPG2
RPG3
RPG5
RPG6
MYCLMP
IL09A
IL10A
RCODE
SS12
SS11
ST12
ST11
SHINC
CRY16
CBT1
TSGN3
RP5
CUG
WX
MWXG
WXG
XB6
XB1
CA4
XB7
CA5
RUG
RUAC
URL15
URL16
UWL16
ST02
ST03
CDUADR
ONECOM
WY
I2
+3V DC B POWER IN
+3V DC TO GATES
0 VDC
C1
C2
C3
C4

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO.
← DENOTES AGC 5 PIN NO.
4. 2M5 35090 ← DENOTES AGC 4 CIRCUIT NO.
DENOTES AGC 5 CIRCUIT NO.

REF. DES.	PART NO	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2			
C3			
C4			

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING
MATERIAL #
HEAT TREATMENT #
FINAL FINISH #

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN A. Dziegielewski DATE 6/4/63
CHECKED
APPROVAL W.B. Turner 20 Aug 63
APPROVAL Elden Cushall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW D

LOGIC MODULE - NO. A27

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006544
SCALE # WT SHEET 1 OF 1

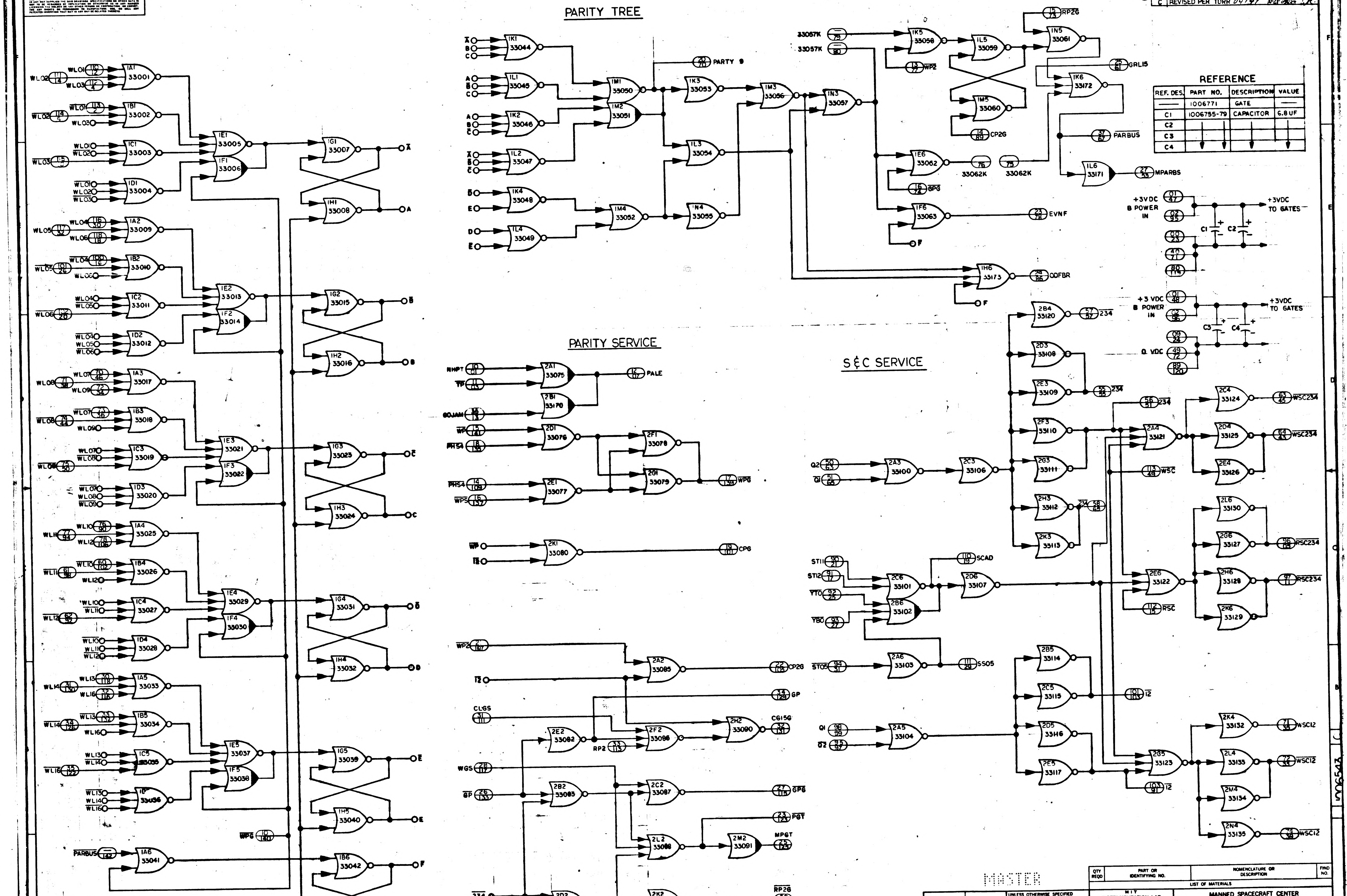
1006544

MASTER

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02287	7/24/63	
B	REVISED PER TDRR 03586	10-3-63	
C	REVISED PER TDRR 04149	10-21-63	

REVISIONS 01749


PARITY TREE
PARITY SERVICE
S&C SERVICE
PARTY 9
RP2G
WP2
CP2G
GRLI5
PARBUS
MPARBS
6PG
EVNF
ODFBR
33062K
33057K
PALE
WPG
CP6
SCAD
SS05
WSC234
RSC234
WSC12
RSC
WSC
CP2G
GP
CG15G
GP6
PGT
MPGT
RP26
+3VDC B POWER IN
+3VDC TO GATES
0 VDC
C1
C2
C3
C4
CPG
PARBUS

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
——	1006771	GATE	——
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 33090 ← ~~DENOTES AGC4~~ CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.
6. SIGNAL NAMES A, $\bar{A}$, B, $\bar{B}$, C, $\bar{C}$, D, $\bar{D}$, E, $\bar{E}$, F, $\bar{F}$ ARE USED FOR REFERENCE ON THIS DRAWING ONLY AND ARE NOT TO BE USED IN COMPUTER LISTINGS

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN R.P. Kingsbury DATE 6/14/63
CHECKED W.T. 26 JUN 63
APPROVAL 6/26/63
APPROVAL 6/26/63
NASA APPROVAL 6-26-63
MIT APPROVAL 26 Jun 63

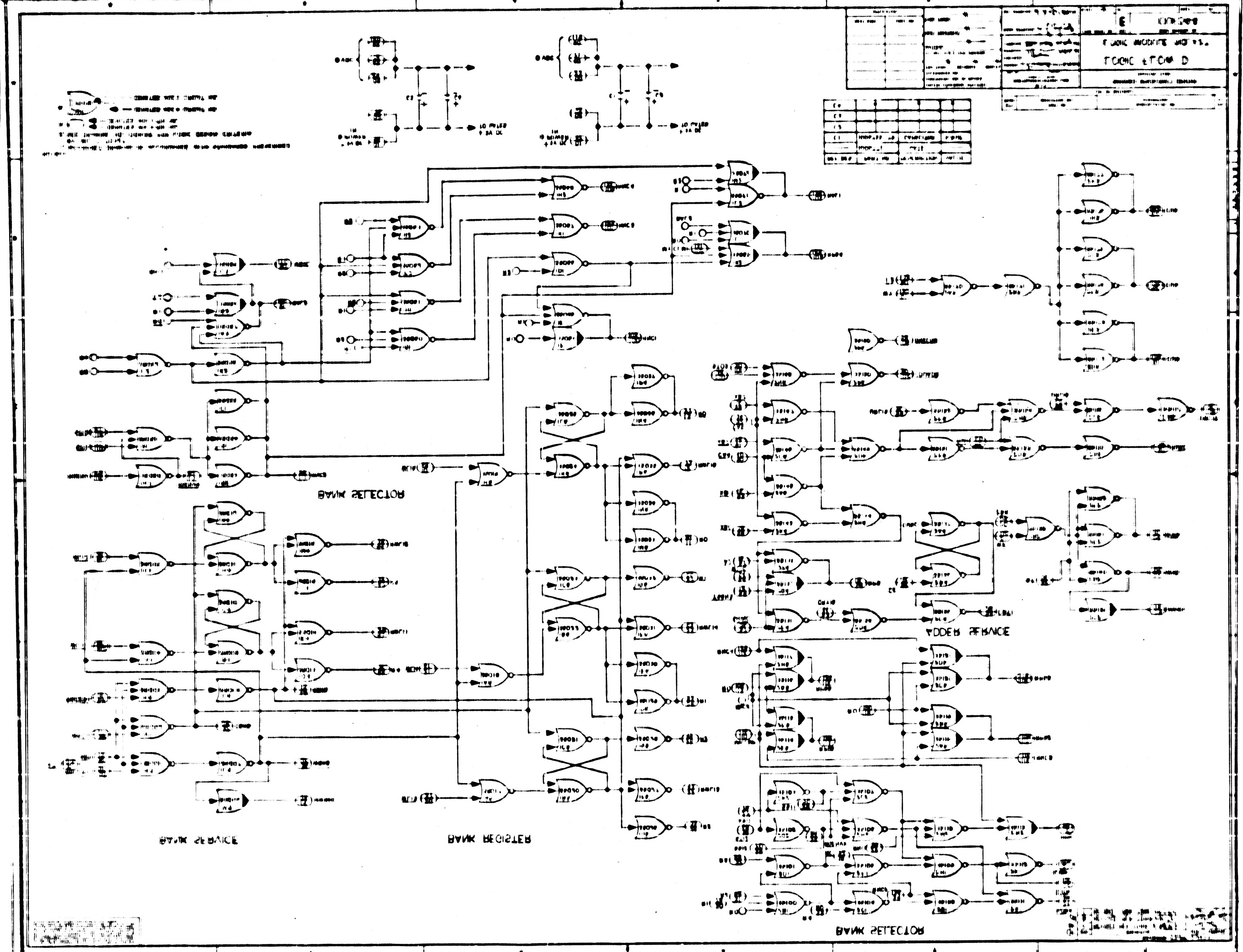
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'C'.
LOGIC MODULE NO. A17.

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006543
SCALE WT SHEET 1 OF 1

1006543

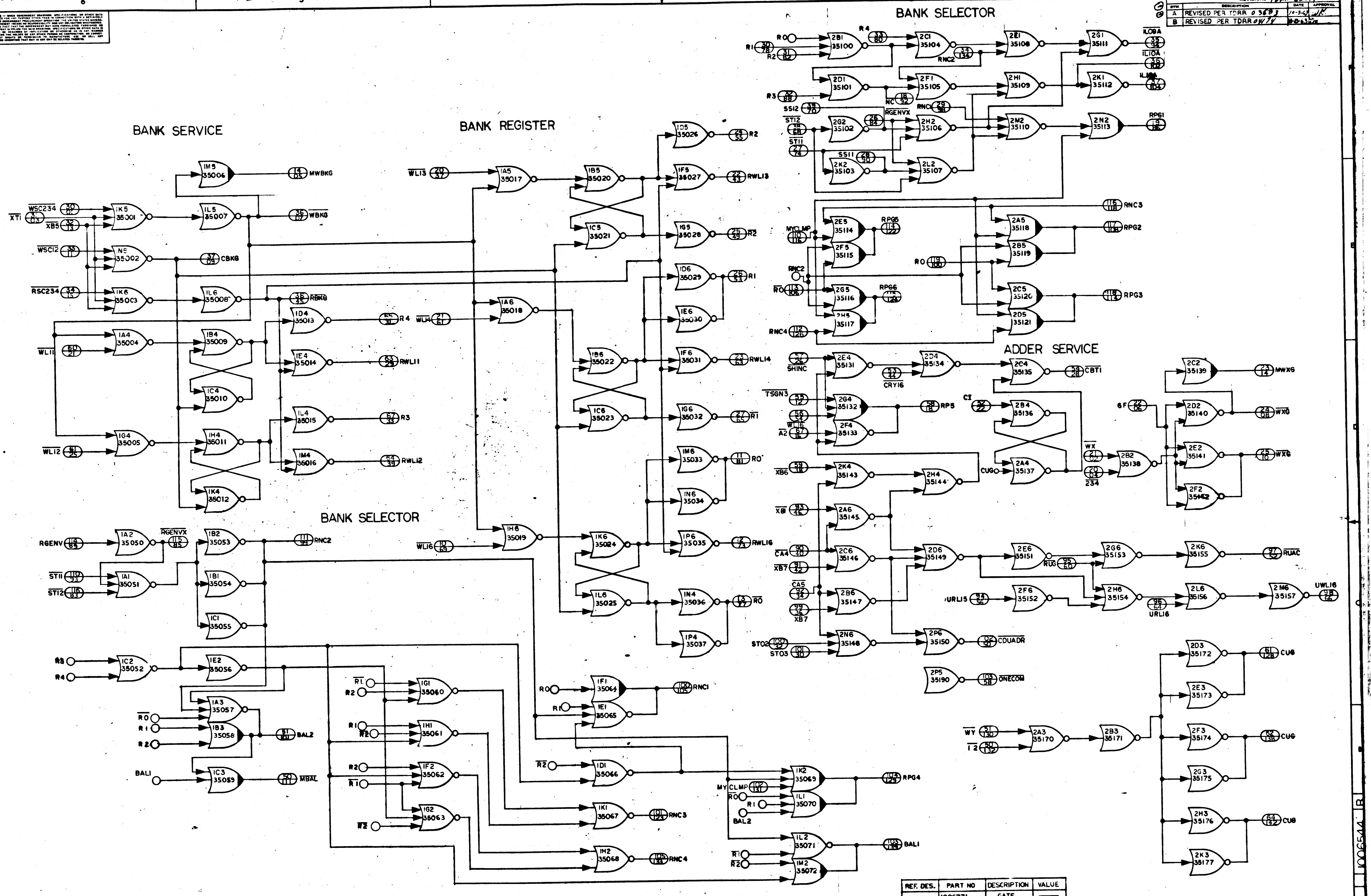
INCHES
PHOTOGRAPHIC SCALE ONLY


BANK SELECTOR
BANK SERVICE
BANK REGISTER
ADDER SERVICE
BANK SELECTOR

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

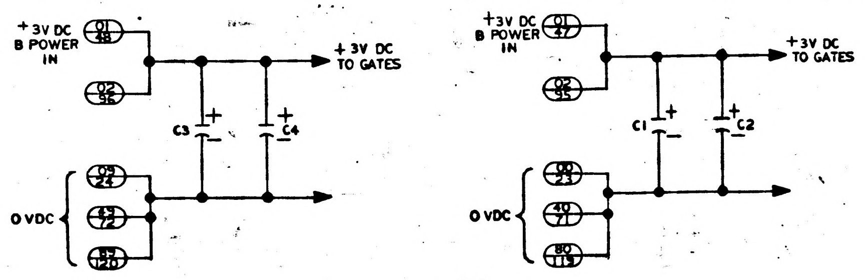
REVISIONS TDRR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03603	10-3-63	WK.
B	REVISED PER TDRR 04174	10-2-63	[illegible]



BANK SELECTOR
BANK SERVICE
BANK REGISTER
BANK SELECTOR
ADDER SERVICE
IM5 35006
IK5 35001
IL5 35007
INE 35002
IK6 35003
IL6 35008
IA4 35004
IG4 35005
IB4 35009
IC4 35010
IH4 35011
IK4 35012
ID4 35013
IE4 35014
IL4 35015
IM4 35016
IA5 35017
IA6 35018
IH6 35019
IB5 35020
IC5 35021
IB6 35022
IC6 35023
IK6 35024
IL6 35025
ID5 35026
IF5 35027
IG5 35028
ID6 35029
IE6 35030
IF6 35031
IG6 35032
IM6 35033
IN6 35034
IP6 35035
IN4 35036
IP4 35037
IA2 35050
IA1 35051
IB2 35053
IB1 35054
IC1 35055
IC2 35052
IE2 35056
IA3 35057
IB3 35058
IC3 35059
IG1 35060
IH1 35061
IF2 35062
IG2 35063
IF1 35064
IE1 35065
ID1 35066
IK1 35067
IH2 35068
IK2 35069
IL1 35070
IL2 35071
IM2 35072
2B1 35100
2D1 35101
2G2 35102
2K2 35103
2C1 35104
2F1 35105
2H2 35106
2L2 35107
2E1 35108
2H1 35109
2M2 35110
2G1 35111
2K1 35112
2N2 35113
2E5 35114
2F5 35115
2G5 35116
2H5 35117
2A5 35118
2B5 35119
2C5 35120
2D5 35121
2E4 35131
2G4 35132
2F4 35133
2D4 35134
2C4 35135
2B4 35136
2A4 35137
2B2 35138
2C2 35139
2D2 35140
2E2 35141
2F2 35142
2K4 35143
2H4 35144
2A6 35145
2C6 35146
2B6 35147
2N6 35148
2D6 35149
2P6 35150
2E6 35151
2F6 35152
2G6 35153
2H6 35154
2K6 35155
2L6 35156
2M6 35157
2P5 35190
2A3 35170
2B3 35171
2D3 35172
2E3 35173
2F3 35174
2G3 35175
2H3 35176
2K3 35177
WSC234
XT1
XB5
WSC12
RSC234
WL11
WL12
WL13
WL14
WL16
MWBKG
WBKG
CBKG
RBKG
R4
RWL11
R3
RWL12
R2
RWL13
R1
RWL14
R0
RWL16
RGENV
RGENVX
ST11
ST12
RNC2
BAL2
BAL1
MBAL
RNC1
RNC3
RNC4
RPG4
MYCLMP
ILO9A
IL10A
IL11A
RPG1
SS12
SS11
RNC
RPG5
RPG6
RPG2
RPG3
SHINC
CRY16
TSGN3
RP5
W16
A2
CBTI
C1
6F
WX
234
CUG
MWXG
WXG
XB6
XB1
CA4
XB7
CA5
RUG
URL15
URL16
UWL16
RUAC
ST02
ST03
CDUADR
ONECOM
WY
I2
CUG

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO.
← DENOTES AGC 5 PIN NO.
4. 2M5 35090 ← DENOTES AGC 4 CIRCUIT NO.
DENOTES AGC 5 CIRCUIT NO.



+3V DC B POWER IN
+3V DC TO GATES
C3
C4
0 VDC
+3V DC B POWER IN
+3V DC TO GATES
C1
C2
0 VDC

REF. DES.	PART NO	DESCRIPTION	VALUE
——	1006771	GATE	——
C1	1006755-79	CAPACITOR	6.8UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG. NO. CONTRACT
DRAWN [illegible] DATE 6/4/63
CHECKED
APPROVAL W.B. Turner 20 Aug 63
APPROVAL [illegible] 20 Aug 63
NASA APPROVAL [illegible] 8/21/63
MIT APPROVAL [illegible] 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

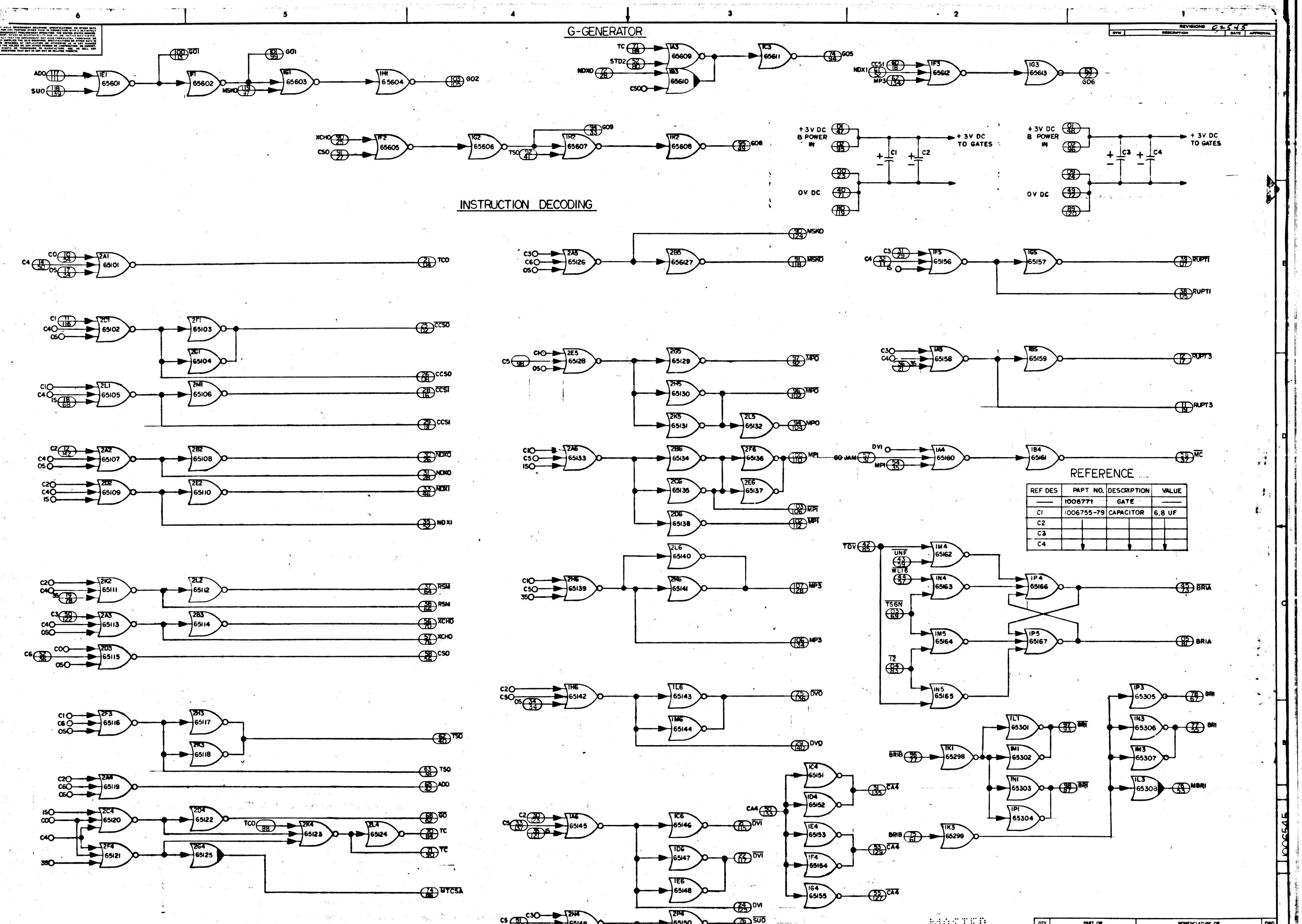
LOGIC FLOW D
LOGIC MODULE - NO. A27

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006544
SCALE —
WT
SHEET 1 OF 1

1006544 B

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY


G-GENERATOR
INSTRUCTION DECODING
G01
G02
G05
G06
G08
G09
+3V DC B POWER IN
+3V DC TO GATES
OV DC
C1
C2
C3
C4
TCO
CCSO
CCSI
NDXO
NDXI
RSM
XCHO
CSO
TSO
ADO
SUO
TC
MYCSA
MSKO
MPO
MPI
MP3
DVO
DVD
DVI
CA4
RUPTI
RUPT3
MC
BRIA
BRI
MBRI
TOV
UNF
WLT6
TSGN
T2
BRIB

REFERENCE

REF DES	PAPT NO.	DESCRIPTION	VALUE
——	1006771	GATE	——
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA

DENOTES AGC4 PIN NO.
DENOTES AGC5 PIN NO.

2M5 65090

DENOTES AGC4 CIRCUIT NO.
DENOTES AGC5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT

DRAWN DATE 6-21-63
CHECKED
APPROVAL W B Turner 8/7/63
APPROVAL Eldon C Hall 12 Aug 63
NASA APPROVAL
MIT APPROVAL W Kupfer 14 Aug 63

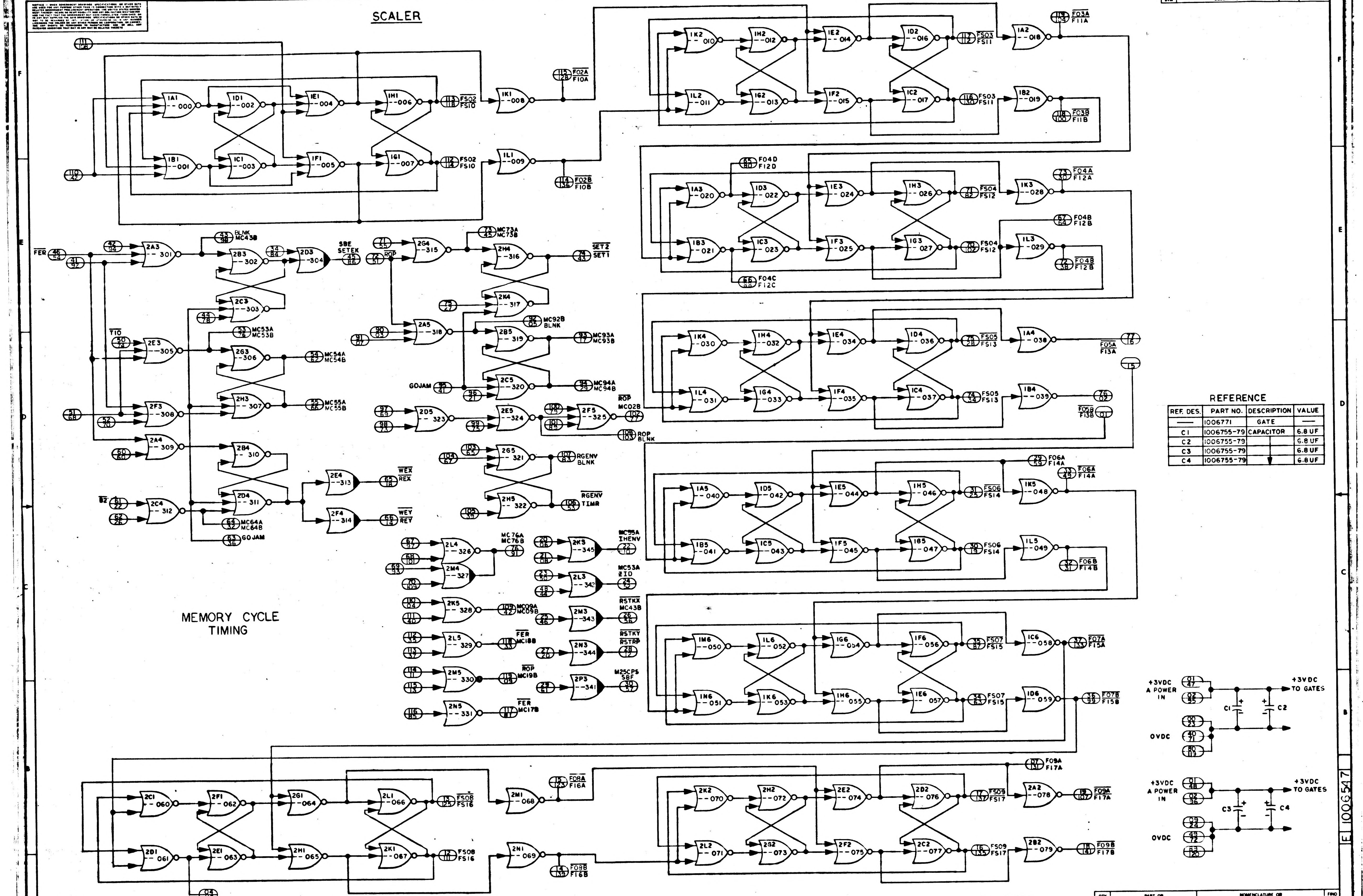
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW E

LOGIC MODULE NO. A23

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006-45
SCALE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY


SCALER
MEMORY CYCLE TIMING
FS02 FS10
F02A F10A
F02B F10B
FS03 FS11
F03A F11A
F03B F11B
F04A F12A
F04B F12B
F04C F12C
F04D F12D
FS04 FS12
FS05 FS13
F05A F13A
F05B F13B
FS06 FS14
F06A F14A
F06B F14B
FS07 FS15
F07A F15A
F07B F15B
FS08 FS16
F08A F16A
F08B F16B
FS09 FS17
F09A F17A
F09B F17B
FER
T10
BZ
BLNK MC43B
SBE SETEK
SET2 SET1
MC73A MC73B
MC92B BLNK
MC93A MC93B
MC94A MC94B
GOJAM
ROP MC02B
ROP BLNK
MC53A MC53B
MC54A MC54B
MC55A MC55B
MC64A MC64B
GO JAM
WEX REX
WEY REY
RGENV BLNK
RGENV TIMR
MC76A MC76B
MC95A IHENV
MC53A ZID
MC09A MC09B
RSTKX MC43B
FER MC18B
RSTKY RSTRP
ROP MC19B
M25CPS SBF
FER MC17B
+3VDC A POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS STICK IS USED TWICE IN THE COMPUTER IN LOCATION 1 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION 2 BY 53. WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
5. 1G3 — DENOTES AGC4 CIRCUIT NO.
   --027 — DENOTES AGC5 CIRCUIT NO.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN J.F. Walsh DATE 5/29/63
CHECKED 11 JUN 63
APPROVAL 12 JUNE 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'G'
LOGIC MODULE NO.

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006547
SCALE
WT
SHEET 1 OF 1

E 1006547

REVISIONS

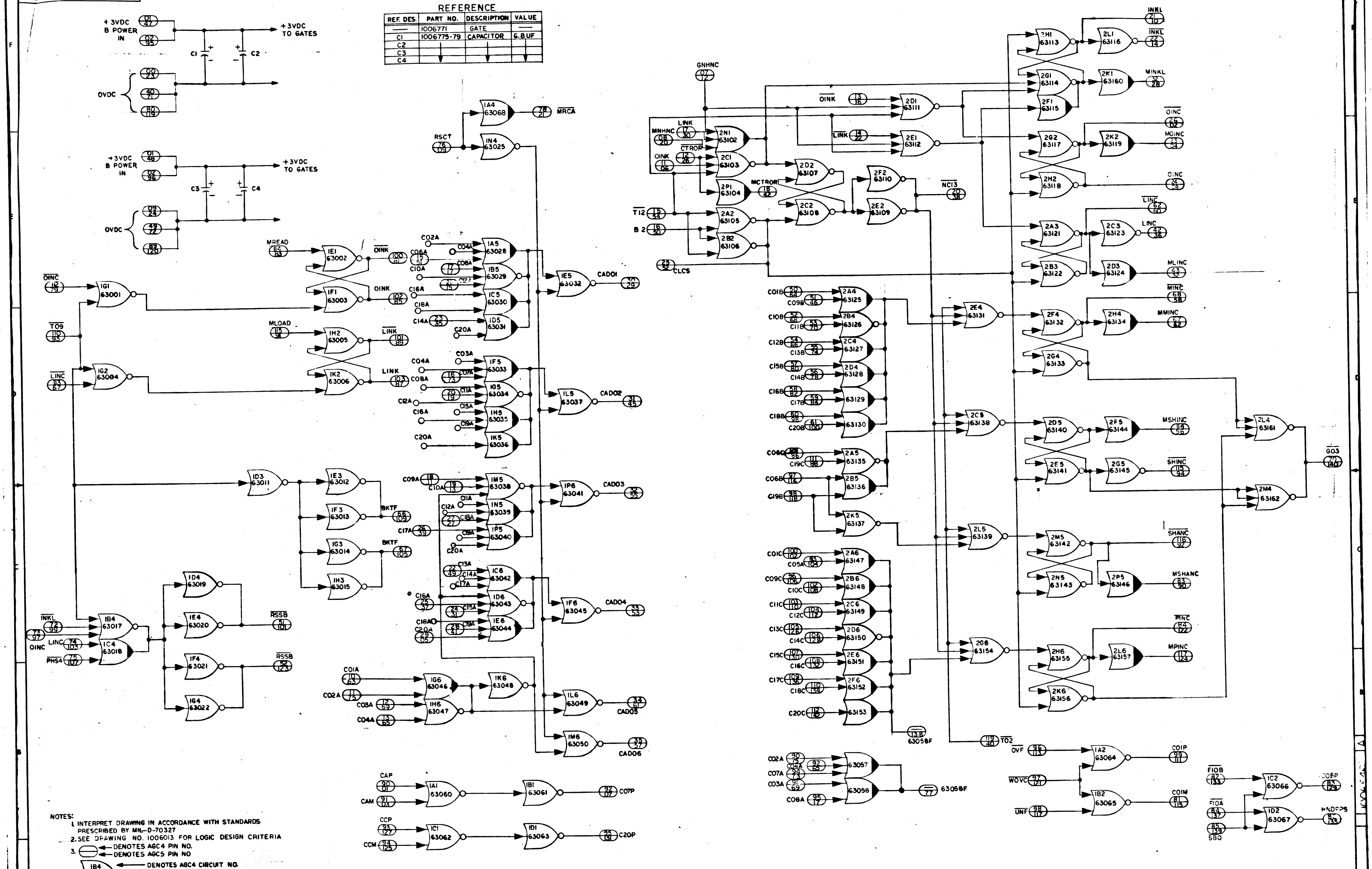
INCHES
PHOTOGRAPHIC SCALE ONLY

SYM	DESCRIPTION		DATE	APPROVAL
A	REVISED PER TDRR 06219			

REVISIONS TDRR 02694

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006775-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓



+3VDC B POWER IN
+3VDC TO GATES
C1
C2
C3
C4
OVDC
MREAD
MLOAD
OINK
LINK
RSCT
MRCA
CAD01
CAD02
CAD03
CAD04
CAD05
CAD06
BKTF
RSSB
INKL
LINC
PHS4
CAP
CAM
CCP
CCM
C07P
C20P
GNHNC
MNHNC
CTROR
MCTROR
T12
B2
CLCS
NC13
MINKL
OINC
MOINC
MLINC
MINC
MMINC
MSHINC
SHINC
SHANC
MSHANC
PINC
MPINC
G03
T02
OVF
WOVC
UNF
C0IP
C0IM
F10B
F10A
SBO
C0RP
HNDRPS
63058F

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL—D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO
4. 1B4 63017 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN DATE 5-29-63
CHECKED
APPROVAL W B Turner 20 Aug 63
APPROVAL Eldon C Hall 20 Aug 63
NASA APPROVAL 11/21/63
MIT APPROVAL Hall 11/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "F"
LOGIC MODULE NO. A-32

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006546
SCALE
WT
SHEET OF

INCHES
PHOTOGRAPHIC SCALE ONLY

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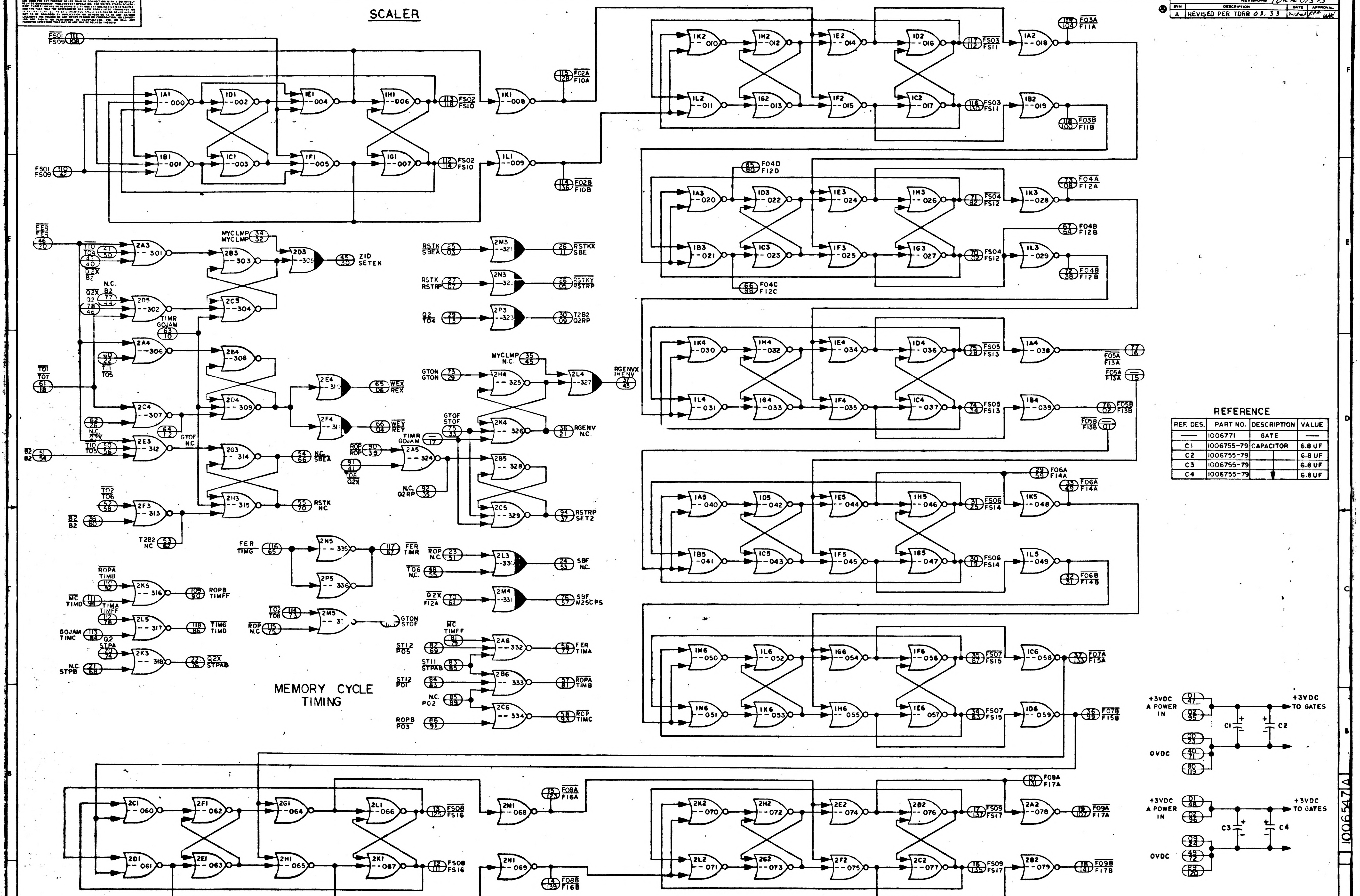
REVISIONS TDRR 01593			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03.33	8-12-63	RPZ WK


SCALER
MEMORY CYCLE TIMING
1A1 --000
1B1 --001
1D1 --002
1C1 --003
1E1 --004
1F1 --005
1H1 --006
1G1 --007
1K1 --008
1L1 --009
1K2 --010
1L2 --011
1H2 --012
1G2 --013
1E2 --014
1F2 --015
1D2 --016
1C2 --017
1A2 --018
1B2 --019
2A3 --301
2B3 --303
2D3 --305
2C3 --304
2D5 --302
2A4 --306
2B4 --308
2C4 --307
2D4 --309
2E3 --312
2E4 --310
2F4 --311
2G3 --314
2H3 --315
2F3 --313
2K5 --316
2L5 --317
2K3 --318
2M3 --321
2N3 --322
2P3 --323
2H4 --325
2L4 --327
2K4 --326
2A5 --324
2B5 --328
2C5 --329
2N5 --335
2P5 --336
2M5 --337
2L3 --330
2M4 --331
2A6 --332
2B6 --333
2C6 --334
2C1 --060
2D1 --061
2F1 --062
2E1 --063
2G1 --064
2H1 --065
2L1 --066
2K1 --067
2M1 --068
2N1 --069
2K2 --070
2L2 --071
2H2 --072
2G2 --073
2E2 --074
2F2 --075
2D2 --076
2C2 --077
2A2 --078
2B2 --079
FS01 FS09
F02A F10A
F02B F10B
FS02 FS10
FS03 FS11
F03A F11A
F03B F11B
F04A F12A
F04B F12B
F04C F12C
F04D F12D
FS04 FS12
FS05 FS13
F05A F13A
F05B F13B
FS06 FS14
F06A F14A
F06B F14B
FS07 FS15
F07A F15A
F07B F15B
FS08 FS16
F08A F16A
F08B F16B
F08C F16C
FS09 FS17
F09A F17A
F09B F17B
ZID SETEK
WEX REX
WEY REY
RSTK NC
RSTKX SBE
RSTKY RSTRP
T2B2 Q2RP
RGENVX IHENV
RGENV N.C.
RSTRP SET2
FER TIMR
SBF N.C.
SBF M25CPS
GTON STOF
FER TIMA
ROPA TIMB
ROP TIMC
ROPB TIMFF
TIMG TIMD
Q2X STPAB
+3VDC A POWER IN
+3VDC TO GATES
0VDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79		6.8 UF
C3	1006755-79		6.8 UF
C4	1006755-79		6.8 UF

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS MODULE IS USED TWICE IN THE COMPUTER IN LOCATION A33 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION A34 BY 53 WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. ⊖ DENOTES AGC 4 PIN NO. / DENOTES AGC 5 PIN NO.
5. 1G3 --027 DENOTES AGC 4 CIRCUIT NO. / DENOTES AGC 5 CIRCUIT NO.
6. N.C. DENOTES NO CONNECTION IN THIS TRAY POSITION.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± — DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS
APPLICATION		MATERIAL —	DRAWN J.F. Walsh DATE 5/29/63
		HEAT TREATMENT —	CHECKED W.E. Turner 11 JUN 63
		FINAL FINISH —	APPROVAL R. Phalen 12 JUNE 63
			APPROVAL D.C. Hill 6/13/63
			NASA APPROVAL Jack Barnes
			MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'G'
LOGIC MODULE NO.

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	E	1006547
SCALE —	WT	SHEET 1 OF 1

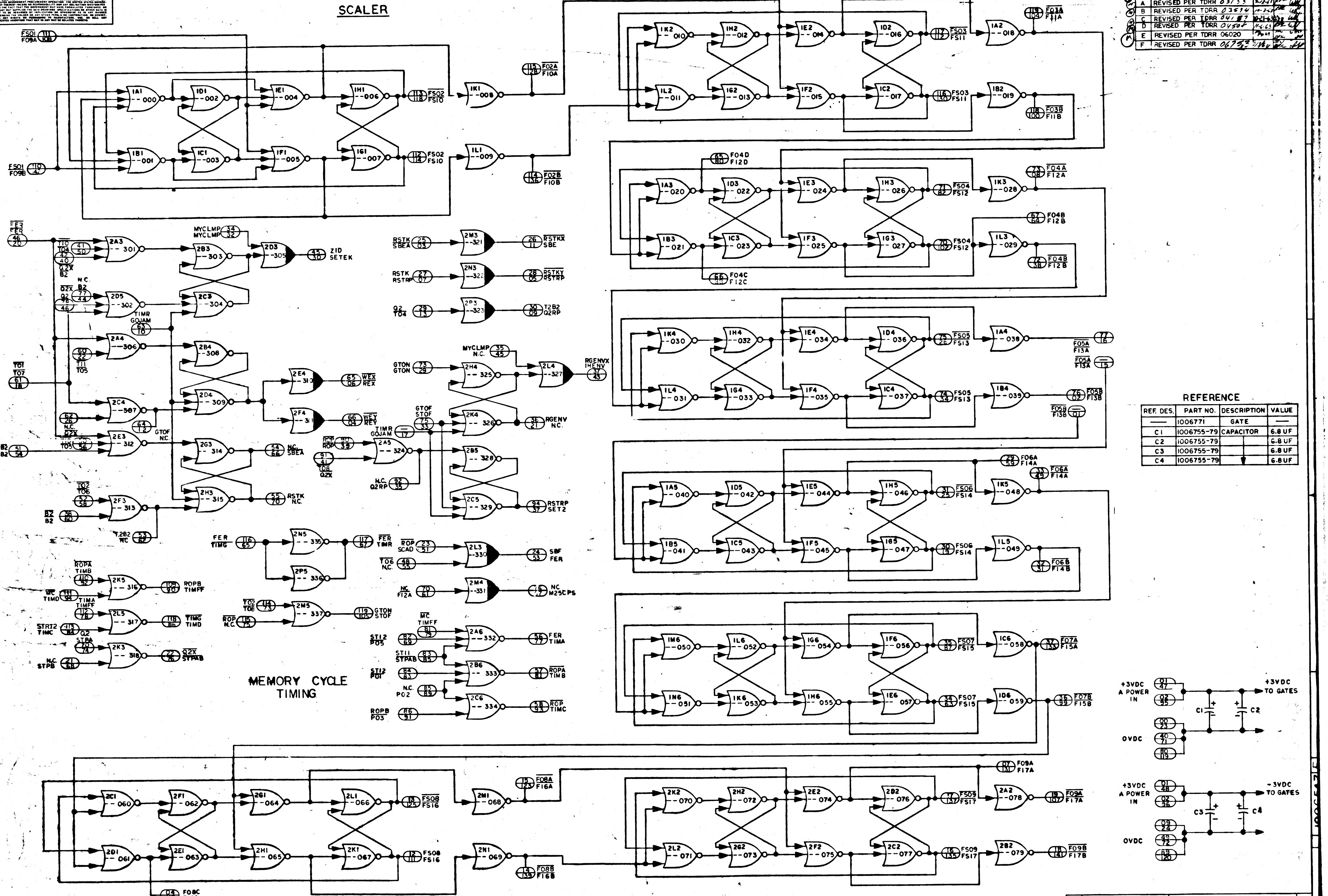
1006547A

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 01583

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03133	9-18-63	
B	REVISED PER TDRR 03594	10-3-63	
C	REVISED PER TDRR 04187	10-21-63	
D	REVISED PER TDRR 04508	11-6-63	
E	REVISED PER TDRR 06020		
F	REVISED PER TDRR 06753		


SCALER
MEMORY CYCLE TIMING
FS01 FO9A
FS01 FO9B
1A1 000
1B1 001
1D1 002
1C1 003
1E1 004
1F1 005
1H1 006
1G1 007
1K1 008
1L1 009
FS02 FS10
F02A F10A
F02B F10B
F03A F11A
F03B F11B
F04A F12A
F04B F12B
F04C F12C
F04D F12D
F05A F13A
F05B F13B
F06A F14A
F06B F14B
F07A F15A
F07B F15B
F08A F16A
F08B F16B
F08C F16C
F09A F17A
F09B F17B
ZID SETEK
WEX REX
WEY REY
RGENVX IHENV
RSTKX SBE
RSTKY RSTRP
T2B2 Q2RP
GTON STOF
M25CPS
ROPB TIMFF
TIMG TIMD
Q2X STPAB
FER TIMA
ROPA TIMB
ROP TIMC
SBF FER
+3VDC A POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4
-3VDC TO GATES

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS MODULE IS USED TWICE IN THE COMPUTER IN LOCATION A33 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION A34 BY 53 NOTE WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. ⊖ ← DENOTES AGC 4 PIN NO. ← DENOTES AGC 5 PIN NO.
5. 1G3 --027 DENOTES AGC 4 CIRCUIT NO. DENOTES AGC 5 CIRCUIT NO.
6. N.C. DENOTES NO CONNECTION IN THIS TRAY POSITION.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT

DRAWN J.E. Welch DATE 5/29/63
CHECKED W. Kuma 11 JUN 63
APPROVAL R Alonso 12 June 63
APPROVAL

NASA APPROVAL Jack Barnard
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'G'
LOGIC MODULE NO. A33-34

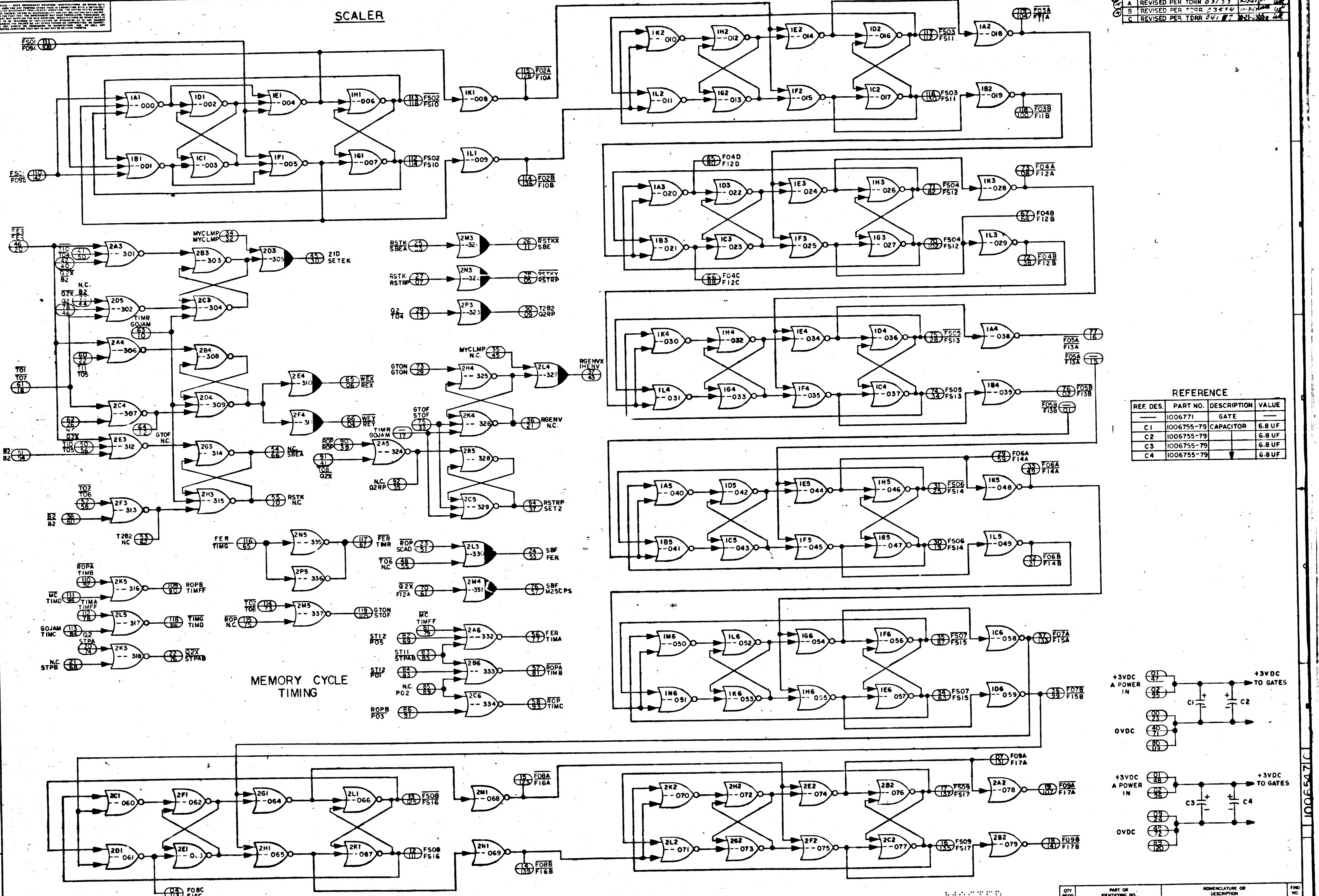
CODE IDENT NO. SIZE E NASA DRAWING NO. 1006547
SCALE — WT SHEET 1 OF 1

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 01513

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03133	2-13-63	RPR WH
B	REVISED PER TDRR 03544	10-3-63	WH
C	REVISED PER TDRR 041 7	10-21-63	WH



REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79		6.8 UF
C3	1006755-79		6.8 UF
C4	1006755-79		6.8 UF

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS MODULE IS USED TWICE IN THE COMPUTER IN LOCATION A33 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION A34 BY 53 WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. ⊖ ← DENOTES AGC 4 PIN NO. ← DENOTES AGC 5 PIN NO.
5. 1G3 - - 027 ← DENOTES AGC 4 CIRCUIT NO. DENOTES AGC 5 CIRCUIT NO.
6. N.C. DENOTES NO CONNECTION IN THIS TRAY POSITION.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN J.F. Walsh DATE 2/27/63
CHECKED W.B. [illegible] 11 JUNE 63
APPROVAL V. Phalen 12 JUNE 63
APPROVAL D.C. [illegible] 6/13/63
NASA APPROVAL Jack [illegible]
MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

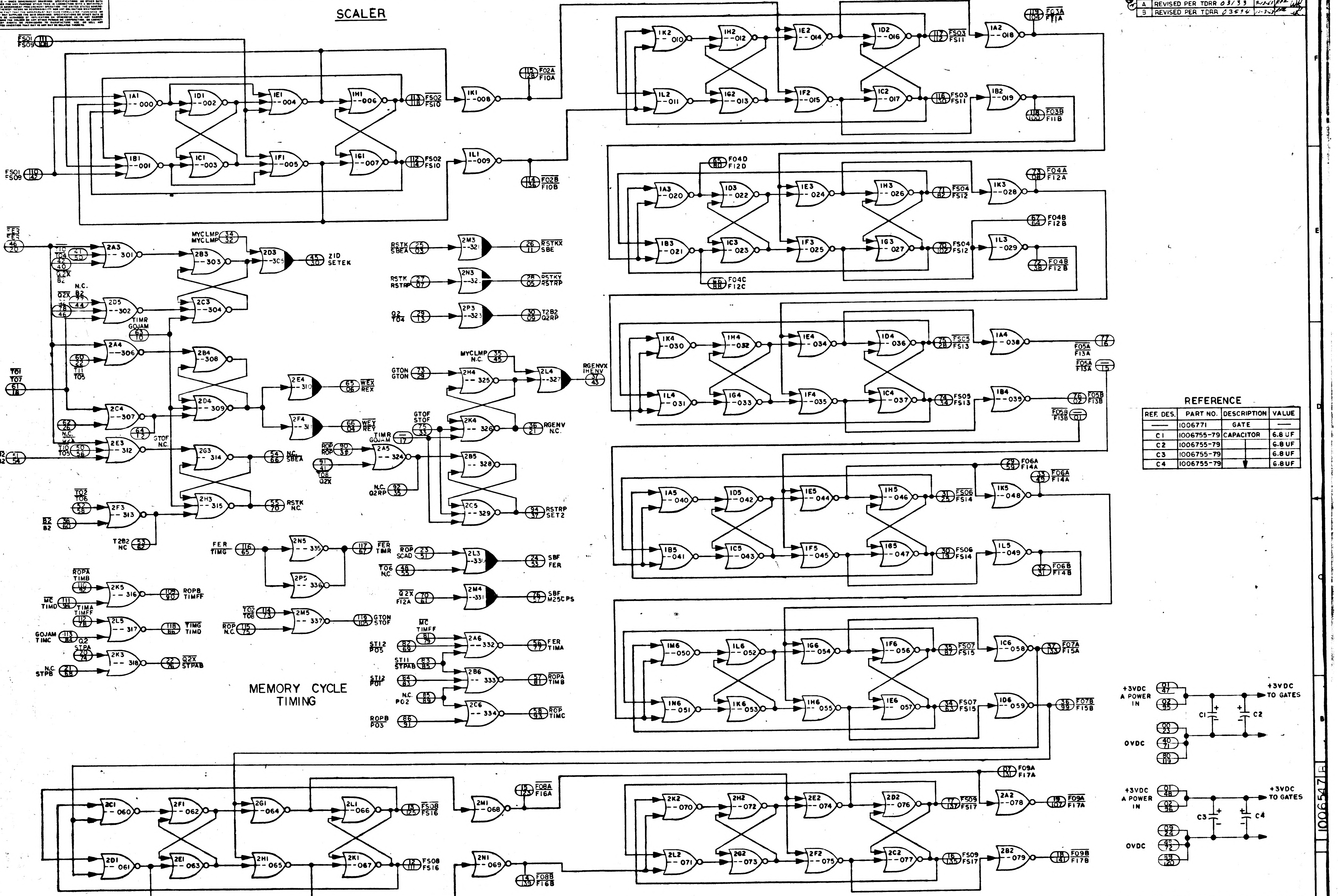
LOGIC FLOW 'G'
LOGIC MODULE NO. A33-34

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006547
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 01593

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03133	9-18-63	RPR WH
B	REVISED PER TDRR 03594	10-3-63	RPR



REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS MODULE IS USED TWICE IN THE COMPUTER IN LOCATION A33 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION A34 BY 53 WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. ⊖ ← DENOTES AGC 4 PIN NO.
   ← DENOTES AGC 5 PIN NO.
5. 1G3 --027 DENOTES AGC 4 CIRCUIT NO.
   DENOTES AGC 5 CIRCUIT NO.
6. N.C. DENOTES NO CONNECTION IN THIS TRAY POSITION.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT

DRAWN O.F. Walsh DATE 5/29/63
CHECKED W.D. ... 11 JUN 63
APPROVAL ... 12 JUNE 63
APPROVAL ... 6/13/63
NASA APPROVAL Jack Barnes
MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'G'
LOGIC MODULE NO. A33-34

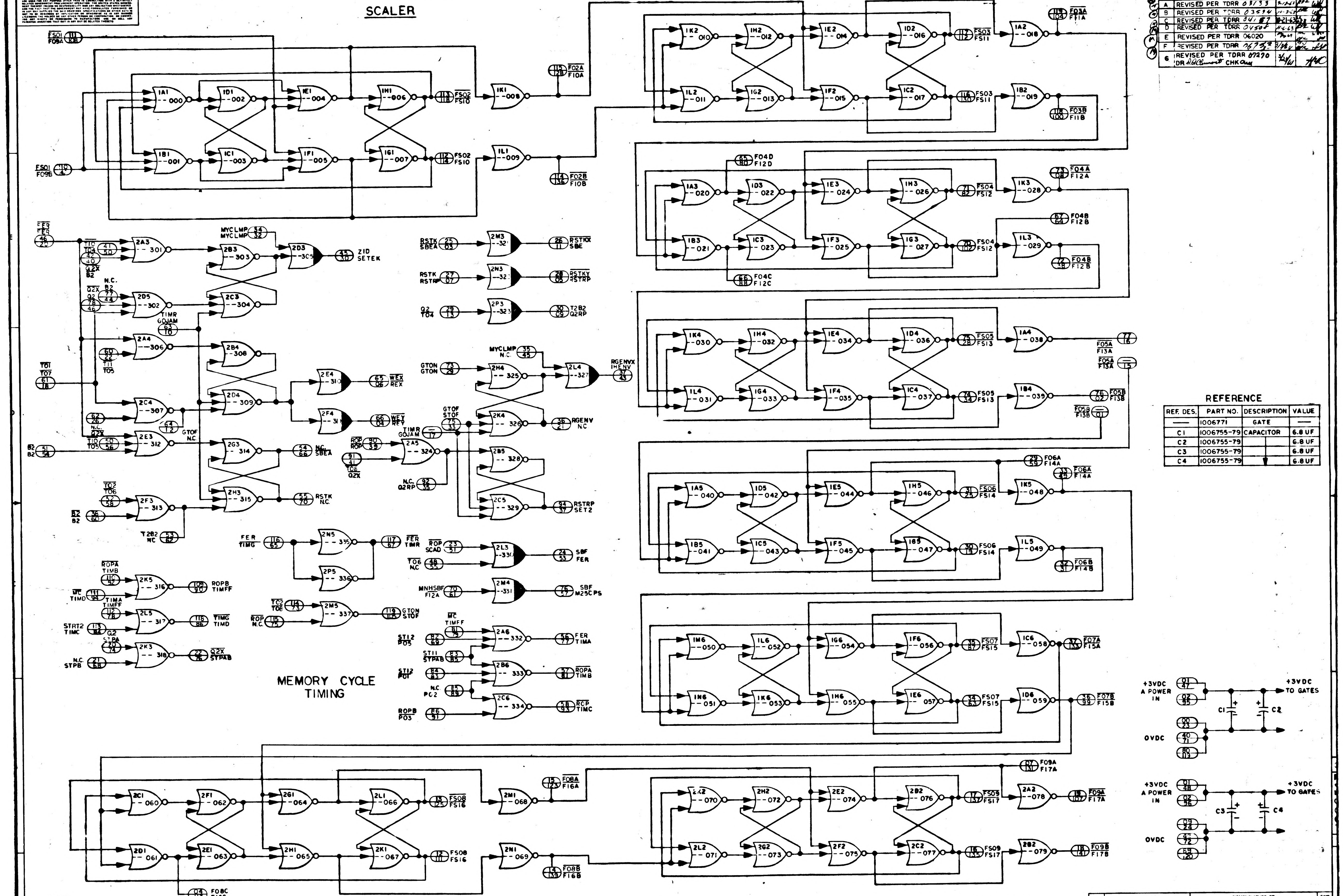
CODE IDENT NO. SIZE E NASA DRAWING NO. 1006547
SCALE — WT SHEET 1 OF 1

1006547 B

NOTICE WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 01513

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03133	9-18-63	WH
B	REVISED PER TDRR 03594	10-3-63	WH
C	REVISED PER TDRR 041 7	10-21-63	WH
D	REVISED PER TDRR 04508	11-6-63	WH
E	REVISED PER TDRR 06020		
F	REVISED PER TDRR 06753	3/26/64	
6	REVISED PER TDRR 07270 DR D.A.Clemente CHK	3/23/64	HRC


SCALER
FS01 FO9A
FS01 FO9B
1A1 000
1D1 002
1E1 004
1H1 006
1K1 008
1B1 001
1C1 003
1F1 005
1G1 007
1L1 009
FS02 FS10
F02A F10A
F02B F10B
1K2 010
1H2 012
1E2 014
1D2 016
1A2 018
1L2 011
1G2 013
1F2 015
1C2 017
1B2 019
FS03 FS11
F03A F11A
F03B F11B
FS04 FS12
F04A F12A
F04B F12B
F04C F12C
F04D F12D
FS05 FS13
F05A F13A
F05B F13B
FS06 FS14
F06A F14A
F06B F14B
FS07 FS15
F07A F15A
F07B F15B
FS08 FS16
F08A F16A
F08B F16B
F08C F16C
FS09 FS17
F09A F17A
F09B F17B
2A3 301
2B3 303
2D3 305
ZID SETEK
2D5 302
2C3 304
2A4 306
2B4 308
2E4 310
WEX REX
2C4 307
2D4 309
2F4 311
WEY REY
2E3 312
2G3 314
N.C. SBEA
2F3 313
2H3 315
RSTK N.C.
2K5 316
ROPB TIMFF
2L5 317
TIMG TIMD
2K3 318
Q2X STPAB
2M3 321
RSTKX SBE
2N3 322
RSTKY RSTRP
2P3 323
T2B2 Q2RP
2H4 325
2L4 327
RGENVX IHENV
2K4 326
RGENV N.C.
2A5 324
2B5 328
2C5 329
RSTRP SET2
2N5 335
2P5 336
FER TIMR
2M5 337
GTON STOF
2L3 330
SBF FER
2M4 331
SBF M25CPS
2A6 332
FER TIMA
2B6 333
ROPA TIMB
2C6 334
RCP TIMC
MEMORY CYCLE TIMING
2C1 060
2F1 062
2G1 064
2L1 066
2M1 068
2D1 061
2E1 063
2H1 065
2K1 067
2N1 069
2K2 070
2H2 072
2E2 074
2B2 076
2A2 078
2L2 071
2G2 073
2F2 075
2C2 077
2B2 079
+3VDC A POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79		6.8 UF
C3	1006755-79		6.8 UF
C4	1006755-79		6.8 UF

NOTES:
1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS MODULE IS USED TWICE IN THE COMPUTER IN LOCATION A33 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION A34 BY 53 WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. ⊖ ← DENOTES AGC 4 PIN NO.
   ← DENOTES AGC 5 PIN NO.
5. 1C3 --027 DENOTES AGC 4 CIRCUIT NO.
   DENOTES AGC 5 CIRCUIT NO.
6. N.C. DENOTES NO CONNECTION IN THIS TRAY POSITION.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY.	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO CONTRACT
DRAWN J.F. Webb DATE 9/20/63
CHECKED W.E. Turner 11 June 63
APPROVAL R. Kalan 12 June 63
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

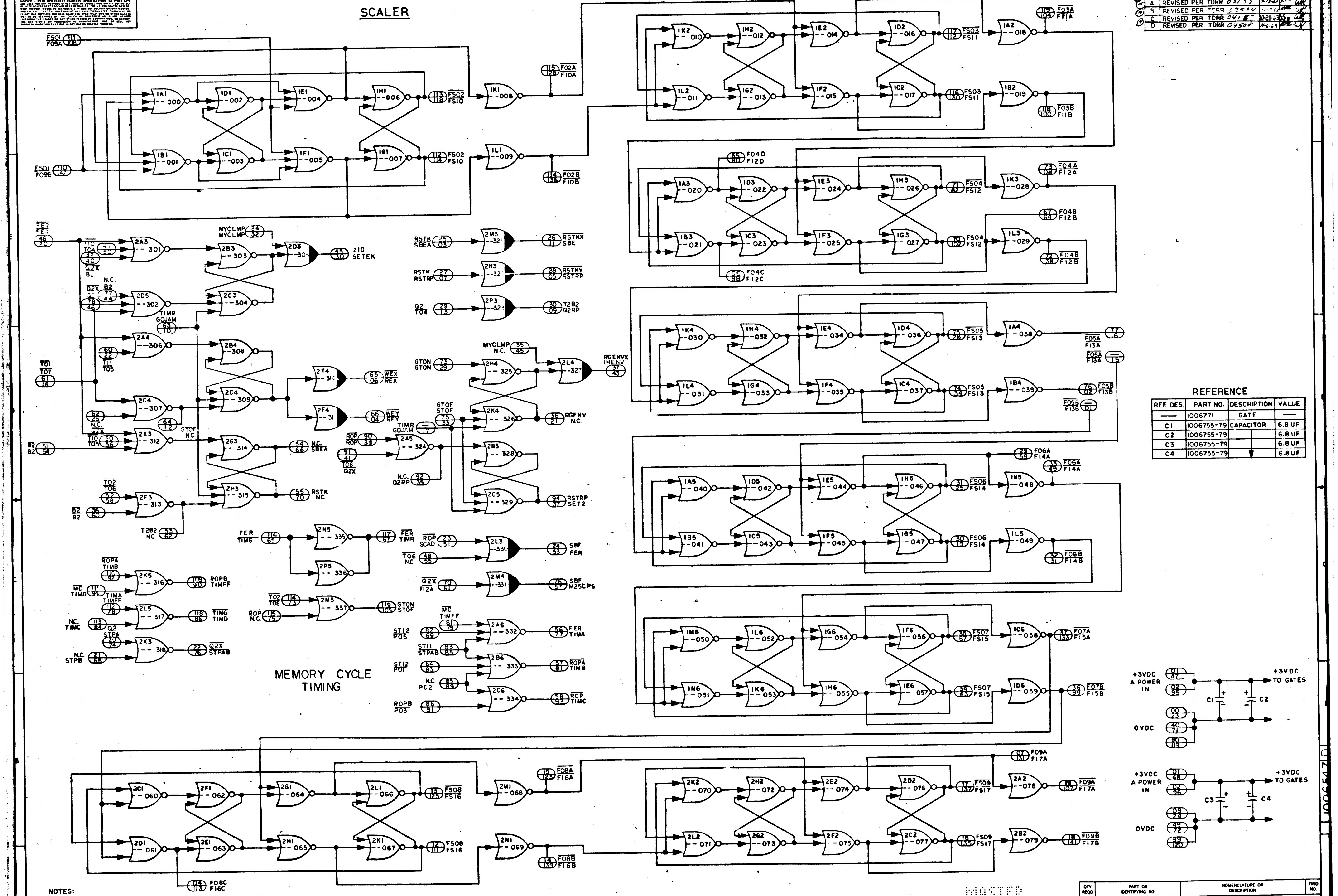
LOGIC FLOW 'G'
LOGIC MODULE NO. A33-34

CODE IDENT NO. — SIZE E NASA DRAWING NO 1006547
SCALE — WT SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 01593

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03133	9-18-63	RPL WH
B	REVISED PER TDRR 03594	10-3-63	WH
C	REVISED PER TDRR 0415	10-21-63	WH
D	REVISED PER TDRR 04508	11-6-63	WH



SCALER
MEMORY CYCLE TIMING
FS01 F09A
FS01 F09B
1A1 000
1B1 001
1D1 002
1C1 003
1E1 004
1F1 005
1H1 006
1G1 007
1K1 008
1L1 009
F02A F10A
F02B F10B
1K2 010
1L2 011
1H2 012
1G2 013
1E2 014
1F2 015
1D2 016
1C2 017
1A2 018
1B2 019
F03A F11A
F03B F11B
ZID SETEK
RSTKX SBE
RSTKY RSTRP
T2B2 Q2RP
RGENVX IHENV
RGENV N.C.
RSTRP SET2
SBF FER
SBF M25CPS
+3VDC A POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS MODULE IS USED TWICE IN THE COMPUTER IN LOCATION A33 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION A34 BY 53 WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. DENOTES AGC4 PIN NO.
   DENOTES AGC5 PIN NO.
5. 1G3 --027 DENOTES AGC4 CIRCUIT NO.
   DENOTES AGC5 CIRCUIT NO.
6. N.C. DENOTES NO CONNECTION IN THIS TRAY POSITION.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN J.F. Walsh DATE 5/29/63
CHECKED W.B. Turner 11 JUN 63
APPROVAL R. Khaler 12 JUNE 63
APPROVAL D.C. Hill 6/13/63
NASA APPROVAL Jack Brennan
MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

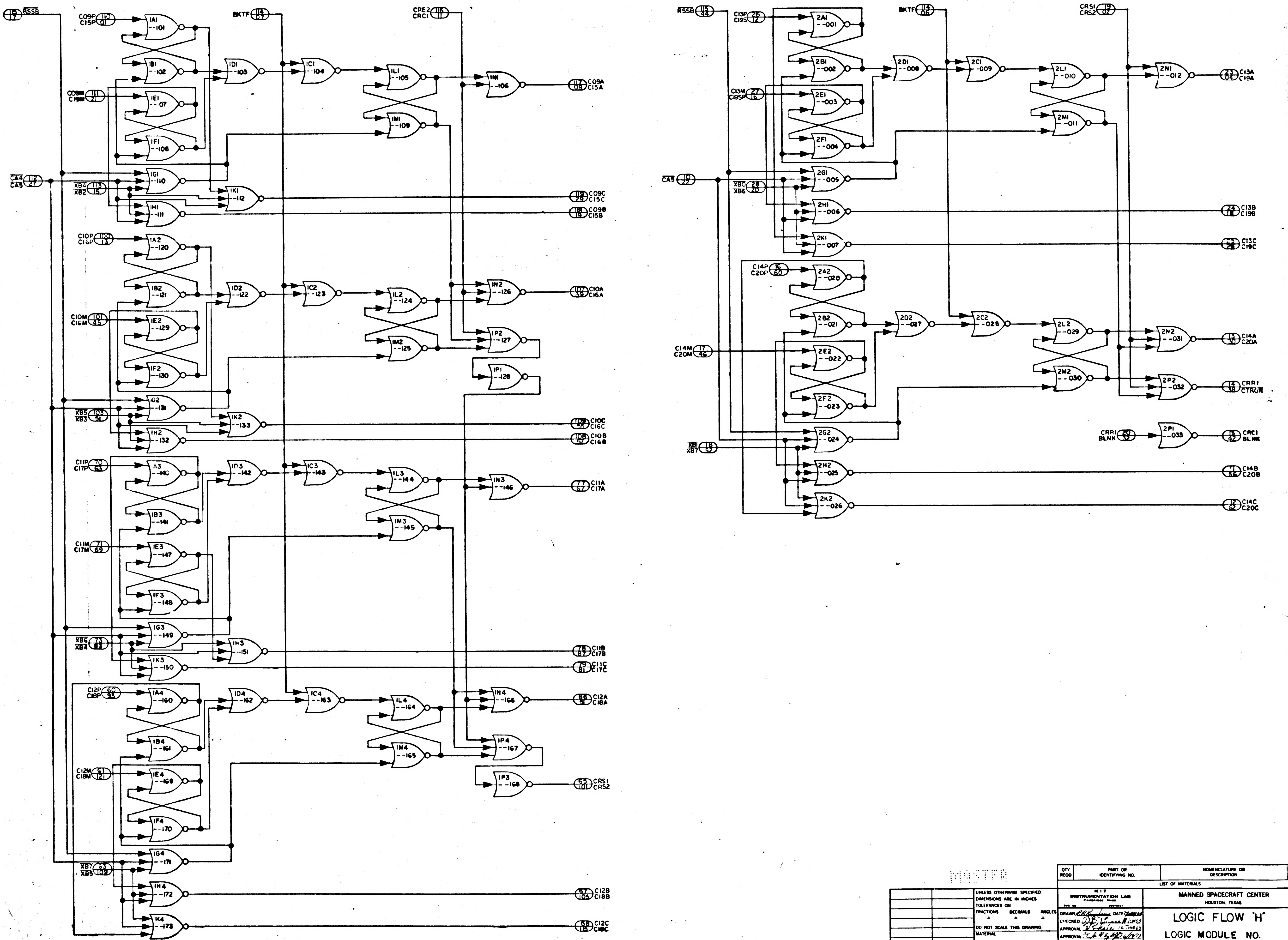
LOGIC FLOW 'G'
LOGIC MODULE NO. A33-34

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006547
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR #1872			
SYM	DESCRIPTION	DATE	APPROVAL

COUNTER INCREMENT PRIORITY



15 / 17 RSSB
C09P C15P 110 / 01
1A1 --101
1B1 --102
C09M C15M 111 / 21
1E1 --107
1F1 --108
CA4 CA5 112 / 27
1G1 --110
XB4 XB2 113 / 15
1H1 --111
1K1 --112
1D1 --103
BKTF 114 / 07
1C1 --104
1L1 --105
1M1 --109
CRE2 CRC1 116 / 11
1N1 --106
117 / 09 C09A C15A
119 / 29 C09C C15C
118 / 19 C09B C15B
C10P C16P 100 / 13
1A2 --120
1B2 --121
C10M C16M 101 / 45
1E2 --129
1F2 --130
1G2 --131
XB5 XB3 103 / 51
1H2 --132
1K2 --133
1D2 --122
1C2 --123
1L2 --124
1M2 --125
1N2 --126
1P2 --127
1P1 --128
107 / 39 C10A C16A
109 / 55 C10C C16C
108 / 57 C10B C16B
C11P C17P 70 / 63
1A3 --140
1B3 --141
C11M C17M 71 / 69
1E3 --147
1F3 --148
1G3 --149
XB6 XB4 73 / 82
1H3 --151
1K3 --150
1D3 --142
1C3 --143
1L3 --144
1M3 --145
1N3 --146
77 / 67 C11A C17A
78 / 87 C11B C17B
79 / 81 C11C C17C
C12P C18P 60 / 93
1A4 --160
1B4 --161
C12M C18M 61 / 121
1E4 --169
1F4 --170
1G4 --171
XB7 XB5 63 / 109
1H4 --172
1K4 --173
1D4 --162
1C4 --163
1L4 --164
1M4 --165
1N4 --166
1P4 --167
1P3 --168
66 / 91 C12A C18A
65 / 101 CRS1 CRS2
67 / 105 C12B C18B
68 / 115 C12C C18C
RSSB 115 / 44
C13P C19S 26 / 12
2A1 --001
2B1 --002
C13M C19SP 27 / 16
2E1 --003
2F1 --004
CA5 10 / 22
2G1 --005
XB0 XB6 28 / 20
2H1 --006
2K1 --007
2D1 --008
BKTF 114 / 06
2C1 --009
2L1 --010
2M1 --011
CRS1 CRS2 19 / 02
2N1 --012
23 / 04 C13A C19A
24 / 18 C13B C19B
C13C C19C
C14P C20P 16 / 60
2A2 --020
2B2 --021
C14M C20M 17 / 46
2E2 --022
2F2 --023
2G2 --024
XB1 XB7 18 / 52
2H2 --025
2K2 --026
2D2 --027
2C2 --028
2L2 --029
2M2 --030
2N2 --031
2P2 --032
CRR1 BLNK 20 / 32
2P1 --033
13 / 30 C14A C20A
14 / 38 CRRI CTROR
15 / 42 CRC1 BLNK
11 / 56 C14B C20B
12 / 62 C14C C20C

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN C.R. Kingsbury DATE
CHECKED
APPROVAL 12 JUNE 63
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "H"
LOGIC MODULE NO.

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006548
SCALE
WT
SHEET 2 OF 2

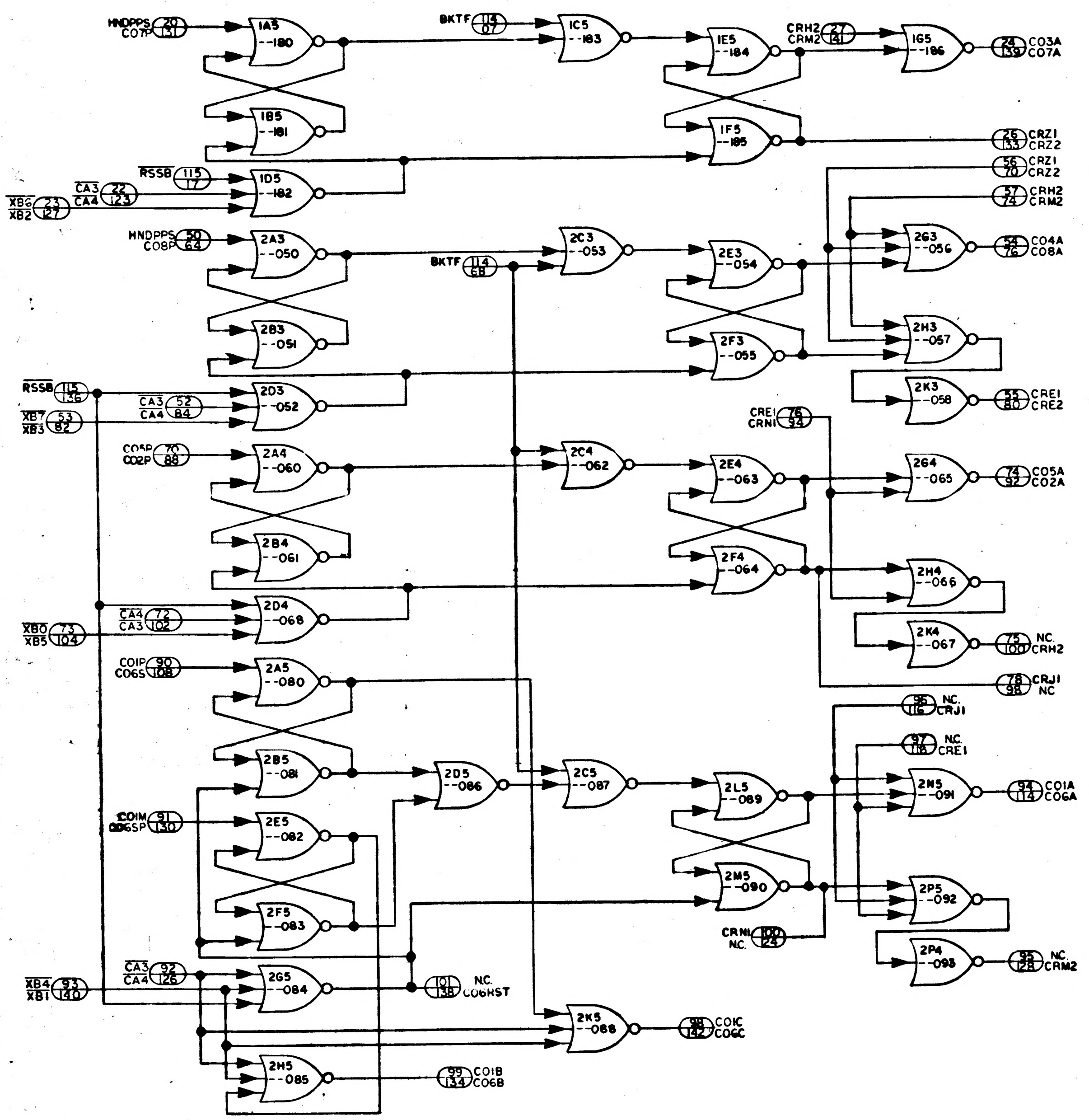
1006548

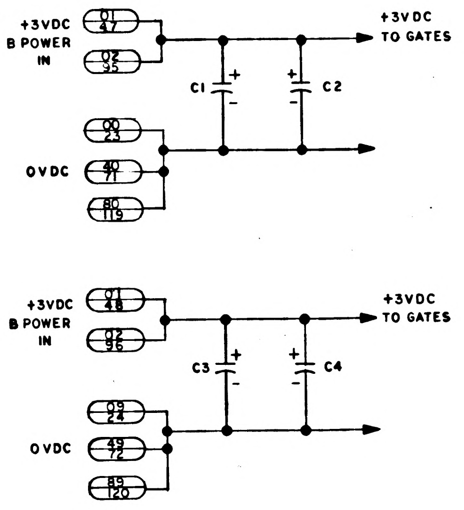
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS TDRR 01572			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03612	10-3-63	wk

COUNTER INCREMENT PRIORITY


HNDPPS
CO7P
1A5 --180
1B5 --181
BKTF
1C5 --183
1E5 --184
1F5 --185
CRH2
CRM2
1G5 --186
CO3A
CO7A
CRZ1
CRZ2
RSSB
1D5 --182
CA3
CA4
XB6
XB2
HNDPPS
CO8P
2A3 --050
2B3 --051
2C3 --053
2E3 --054
2F3 --055
2G3 --056
2H3 --057
2K3 --058
CO4A
CO8A
CRE1
CRE2
RSSB
2D3 --052
XB7
XB3
CO5P
CO2P
2A4 --060
2B4 --061
2C4 --062
2E4 --063
2F4 --064
2G4 --065
2H4 --066
2K4 --067
CRE1
CRN1
CO5A
CO2A
NC
CRH2
CRJ1
NC
2D4 --068
XB0
XB5
CO1P
CO6S
2A5 --080
2B5 --081
2D5 --086
2C5 --087
2L5 --089
2M5 --090
2N5 --091
2P5 --092
2P4 --093
CO1A
CO6A
CRM2
CO1M
CO6SP
2E5 --082
2F5 --083
CRN1
NC.
NC
CO6RST
XB4
XB1
2G5 --084
2H5 --085
2K5 --088
CO1C
CO6C
CO1B
CO6B


+3VDC
B POWER
IN
+3VDC
TO GATES
C1
C2
0VDC
+3VDC
B POWER
IN
+3VDC
TO GATES
C3
C4
0VDC

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. THIS STICK IS USED TWICE IN THE COMPUTER. IN LOCATION 1 THE CIRCUIT NUMBERS ARE PRECEDED BY 58, IN LOCATION 2 BY 59. WHEN TWO SIGNALS NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 58000 SERIES, THE LOWER ONE TO THE 59000 SERIES.
3. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
4. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
5. 2M5 --090 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN C.C. Kingsbury DATE
CHECKED 11 JUN 63
APPROVAL 12 JUNE 63
APPROVAL D.C. Hall 6/14/63
NASA APPROVAL
MIT APPROVAL

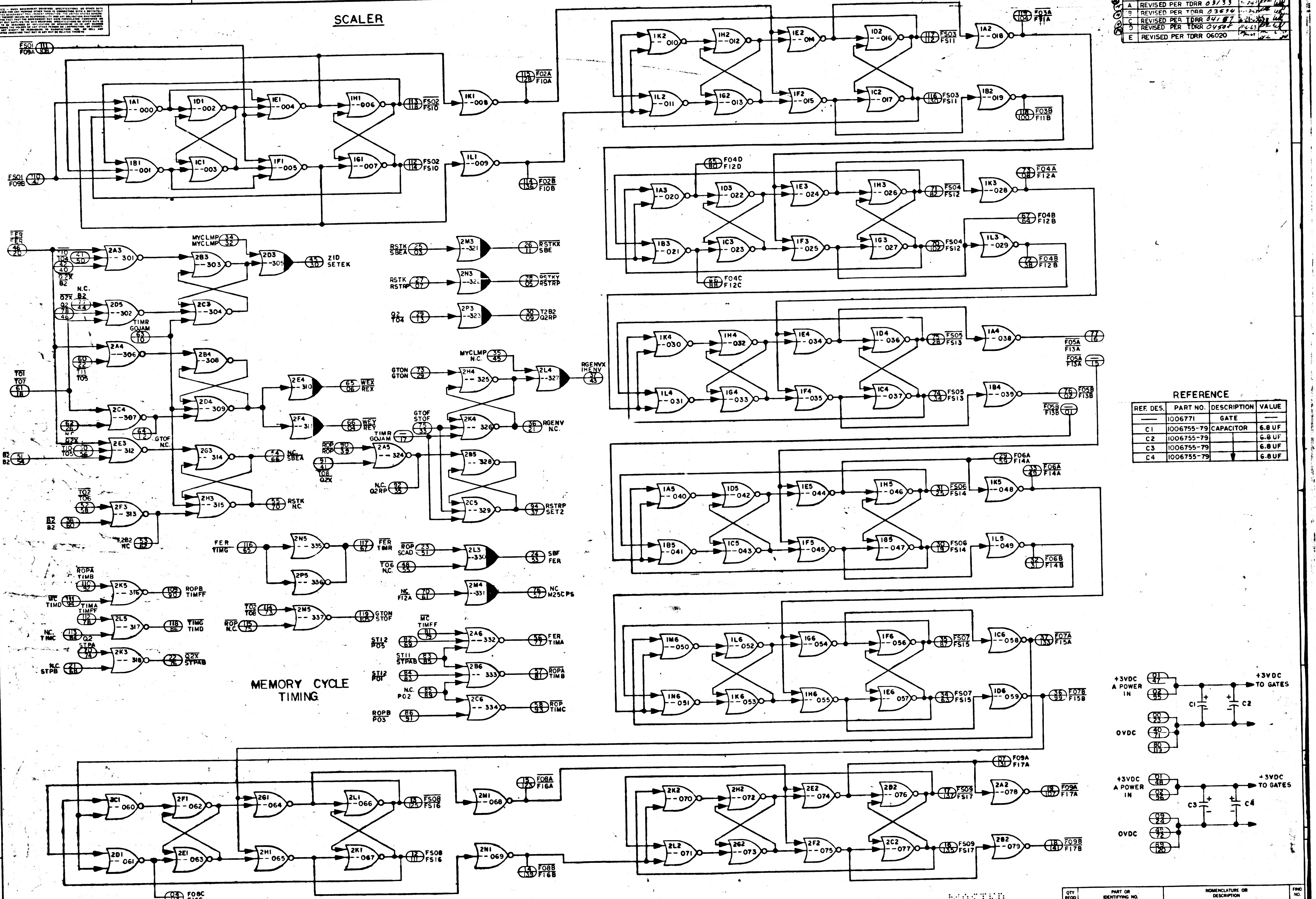
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "H"
LOGIC MODULE NO.A30-A3

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006548
SCALE
WT
SHEET 1 OF 2

1006548A

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS TDRR 01593		
A	REVISED PER TDRR 03133	9-2-63	RDE WH
B	REVISED PER TDRR 03594	---3-63	RDE WH
C	REVISED PER TDRR 04187	11-21-63	RDE WH
D	REVISED PER TDRR 04508	11-6-63	RDE WH
E	REVISED PER TDRR 06020	[illegible] 64	[illegible]


SCALER
MEMORY CYCLE TIMING
1A1 000
1B1 001
1D1 002
1C1 003
1E1 004
1F1 005
1H1 006
1G1 007
1K1 008
1L1 009
FS01 F09A
FS01 F09B
FS02 FS10
F02A F10A
F02B F10B
+3VDC A POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4
ZID SETEK
RSTK SBEA
RGENVX IHENV
MASTER

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:

1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DWG NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. THIS MODULE IS USED TWICE IN THE COMPUTER IN LOCATION A33 THE CIRCUIT NUMBERS ARE PRECEDED BY 52, IN LOCATION A34 BY 53 WHEN TWO SIGNAL NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 52 SERIES, THE LOWER ONE TO THE 53 SERIES
4. ⊖ ← DENOTES AGC 4 PIN NO. ← DENOTES AGC 5 PIN NO.
5. 1G3 027 DENOTES AGC 4 CIRCUIT NO. DENOTES AGC 5 CIRCUIT NO.
6. N.C. DENOTES NO CONNECTION IN THIS TRAY POSITION.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —//— DECIMALS ± —//— ANGLES ± —//—
DO NOT SCALE THIS DRAWING
MATERIAL —//—
HEAT TREATMENT —//—
FINAL FINISH —//—

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.F. Walsh DATE 9/21/63
CHECKED W.B. Turner 11 JUN 63
APPROVAL [illegible] 12 JUNE 63
APPROVAL D.C. Hall [illegible]
NASA APPROVAL Jack Barnard
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'G'
LOGIC MODULE NO. A33-34

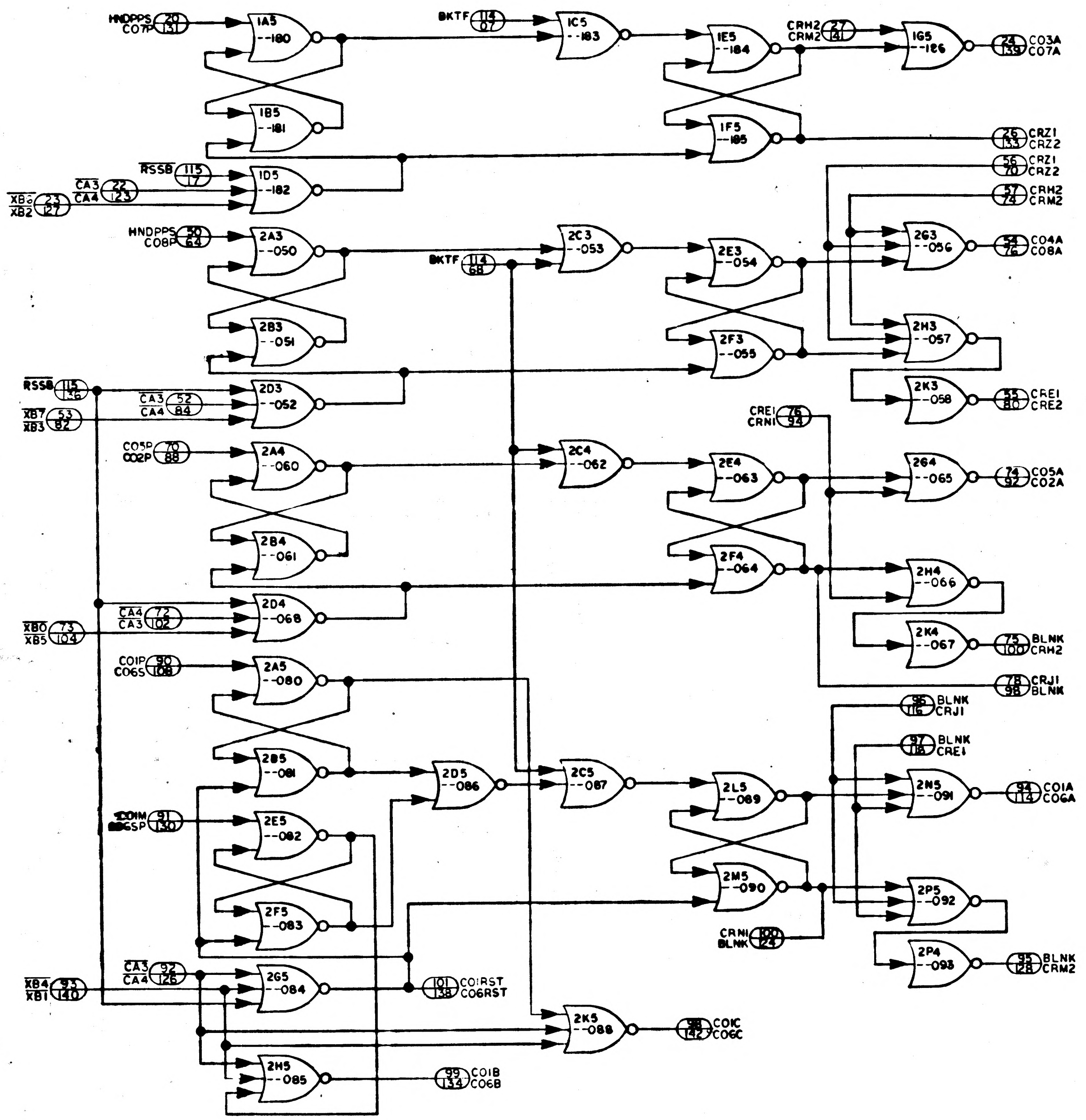
CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006547
SCALE —//— WT
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

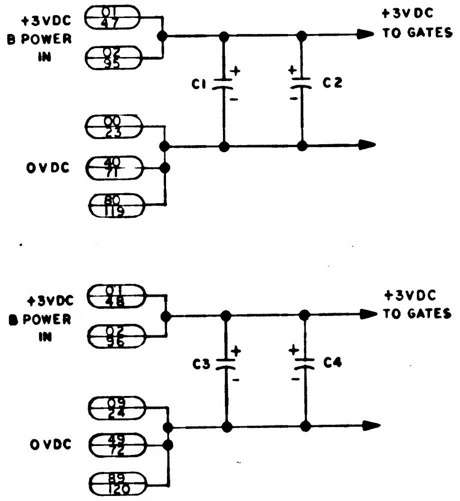
SYM	DESCRIPTION	DATE	APPROVAL

COUNTER INCREMENT PRIORITY


HNDPPS 20
CO7P 131
1A5 --180
1B5 --181
RSSB 115 17
CA3 22
CA4 123
XB6 23
XB2 127
1D5 --182
BKTF 114 07
1C5 --183
1E5 --184
1F5 --185
CRH2 27
CRM2 141
1G5 --186
24 CO3A
139 CO7A
26 CRZ1
133 CRZ2
56 CRZ1
70 CRZ2
57 CRH2
74 CRM2
HNDPPS 50
CO8P 64
2A3 --050
2B3 --051
BKTF 114 68
2C3 --053
2E3 --054
2F3 --055
2G3 --056
54 CO4A
76 CO8A
2H3 --057
2K3 --058
55 CRE1
80 CRE2
RSSB 115 136
CA3 52
CA4 84
XB7 53
XB3 82
2D3 --052
CO5P 70
CO2P 88
2A4 --060
2B4 --061
2C4 --062
CRE1 76
CRN1 94
2E4 --063
2F4 --064
2G4 --065
74 CO5A
92 CO2A
2H4 --066
2K4 --067
75 BLNK
100 CRH2
78 CRJ1
98 BLNK
CA4 72
CA3 102
XB0 73
XB5 104
2D4 --068
CO1P 90
CO6S 108
2A5 --080
2B5 --081
CO1M 91
CO6SP 130
2E5 --082
2F5 --083
2D5 --086
2C5 --087
2L5 --089
2M5 --090
95 BLNK
116 CRJ1
97 BLNK
118 CRE1
2N5 --091
94 CO1A
114 CO6A
2P5 --092
2P4 --093
95 BLNK
128 CRM2
CRN1 100
BLNK 124
CA3 92
CA4 126
XB4 93
XB1 140
2G5 --084
101 CO1RST
138 CO6RST
2K5 --088
98 CO1C
142 CO6C
2H5 --085
99 CO1B
134 CO6B

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF


+3VDC
B POWER
IN
01 47
02 95
+3VDC
TO GATES
C1
C2
+
-
00 23
OVDC
40 71
80 119
+3VDC
B POWER
IN
01 48
02 96
+3VDC
TO GATES
C3
C4
09 24
OVDC
49 72
89 120

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. THIS STICK IS USED TWICE IN THE COMPUTER. IN LOCATION 1 THE CIRCUIT NUMBERS ARE PRECEDED BY 58, IN LOCATION 2 BY 59. WHEN TWO SIGNALS NAMES ARE SHOWN, THE UPPER ONE CORRESPONDS TO THE 58000 SERIES, THE LOWER ONE TO THE 59000 SERIES.
3. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
4. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
5. 2M5 ← DENOTES AGC4 CIRCUIT NO.
   --090 ← DENOTES AGC5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN [illegible] DATE [illegible]
CHECKED [illegible] 11 JUN 63
APPROVAL [illegible] 12 JUNE 63
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

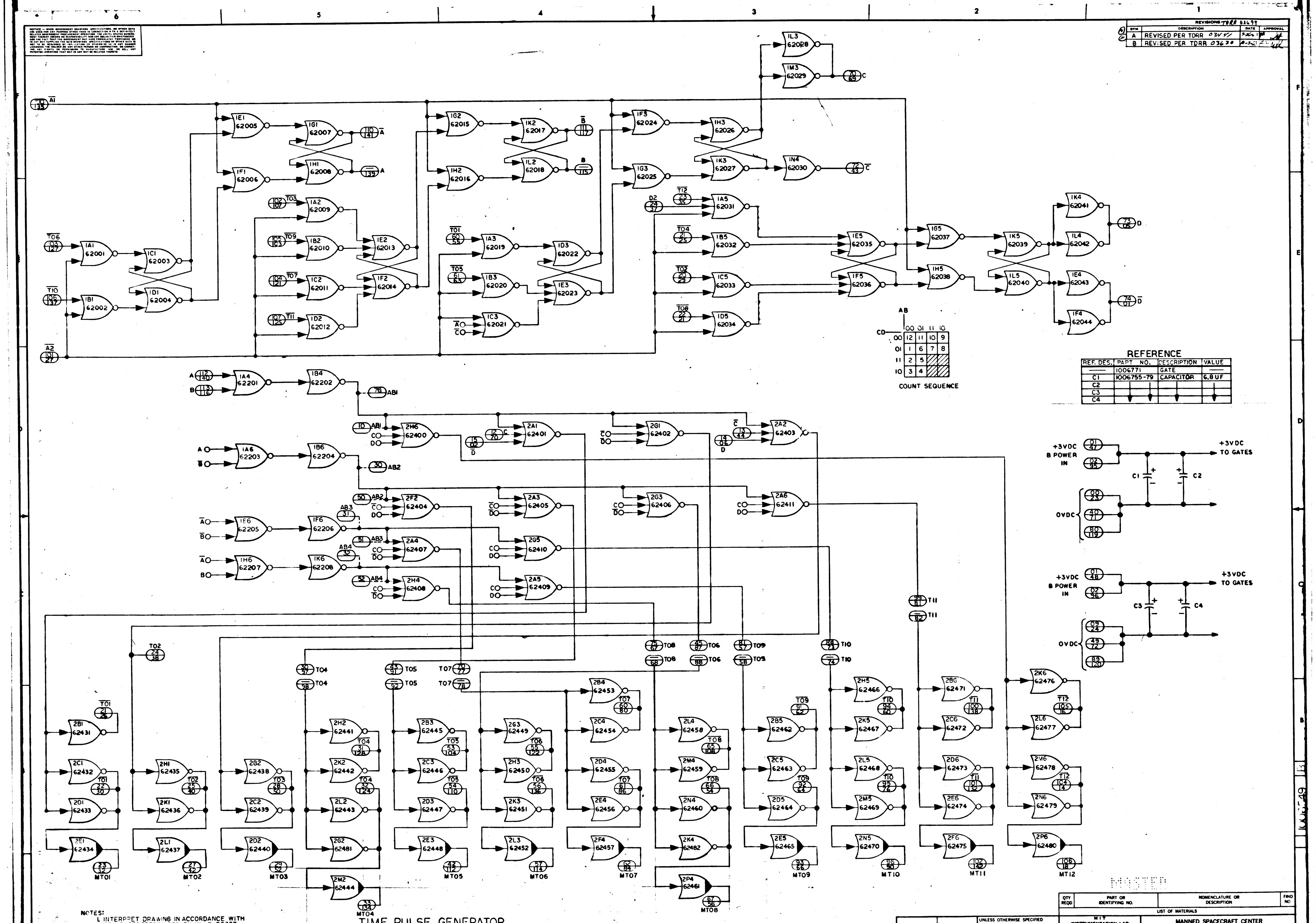
LOGIC FLOW 'H'
LOGIC MODULE NO.

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006548
SCALE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS TDRR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03441	9-26-	
B	REVISED PER TDRR 03620		


A1
A2
T06
T10
1A1 62001
1B1 62002
1C1 62003
1D1 62004
1E1 62005
1F1 62006
1G1 62007
1H1 62008
A
A
B
B
C
C
D
D
1L3 62028
1M3 62029
1N4 62030
1K5 62039
1L5 62040
1K4 62041
1L4 62042
1E4 62043
1F4 62044
AB1
AB2
AB3
AB4
+3VDC B POWER IN
+3VDC TO GATES
0VDC
C1
C2
C3
C4
T01
T02
T03
T04
T05
T06
T07
T08
T09
T10
T11
T12
MT01
MT02
MT03
MT04
MT05
MT06
MT07
MT08
MT09
MT10
MT11
MT12
MASTER

	00	01	11	10
00	12	11	10	9
01	1	6	7	8
11	2	5	▨	▨
10	3	4	▨	▨

AB
CD

COUNT SEQUENCE

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
——	1006771	GATE	——
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 62090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.

TIME PULSE GENERATOR
1T COUNTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING
MATERIAL #
HEAT TREATMENT #
FINAL FINISH #

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN C.P. Kingsbury DATE
CHECKED
APPROVAL W.B. Turner 20 AUG 63
APPROVAL 20 Aug 63
NASA APPROVAL 9/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

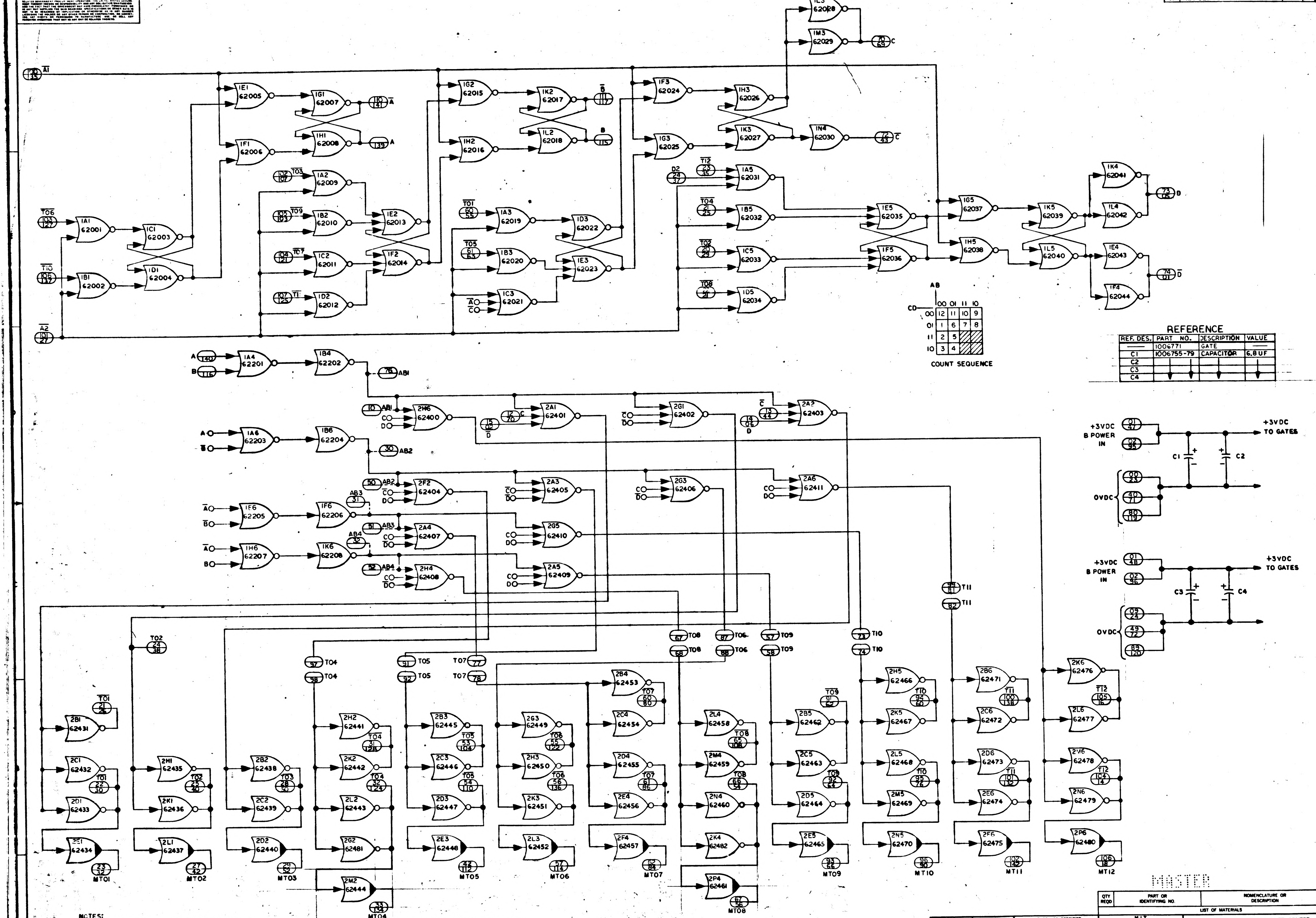
LOGIC FLOW "J"
LOGIC MODULE NO. A26

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006549
SCALE # WT # SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TORR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TORR 03441	9-26-67	



COUNT SEQUENCE

CD \ AB	00	01	11	10
00	12	11	10	9
01	1	6	7	8
11	2	5	▨	▨
10	3	4	▨	▨

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. DENOTES AGC4 PIN NO. / DENOTES AGC5 PIN NO.
4. 2M5 DENOTES AGC4 CIRCUIT NO. / 62090 DENOTES AGC5 CIRCUIT NO.

TIME PULSE GENERATOR
IT COUNTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN DATE
CHECKED
APPROVAL W.B. Turner 20 Aug 63
APPROVAL 20 Aug 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

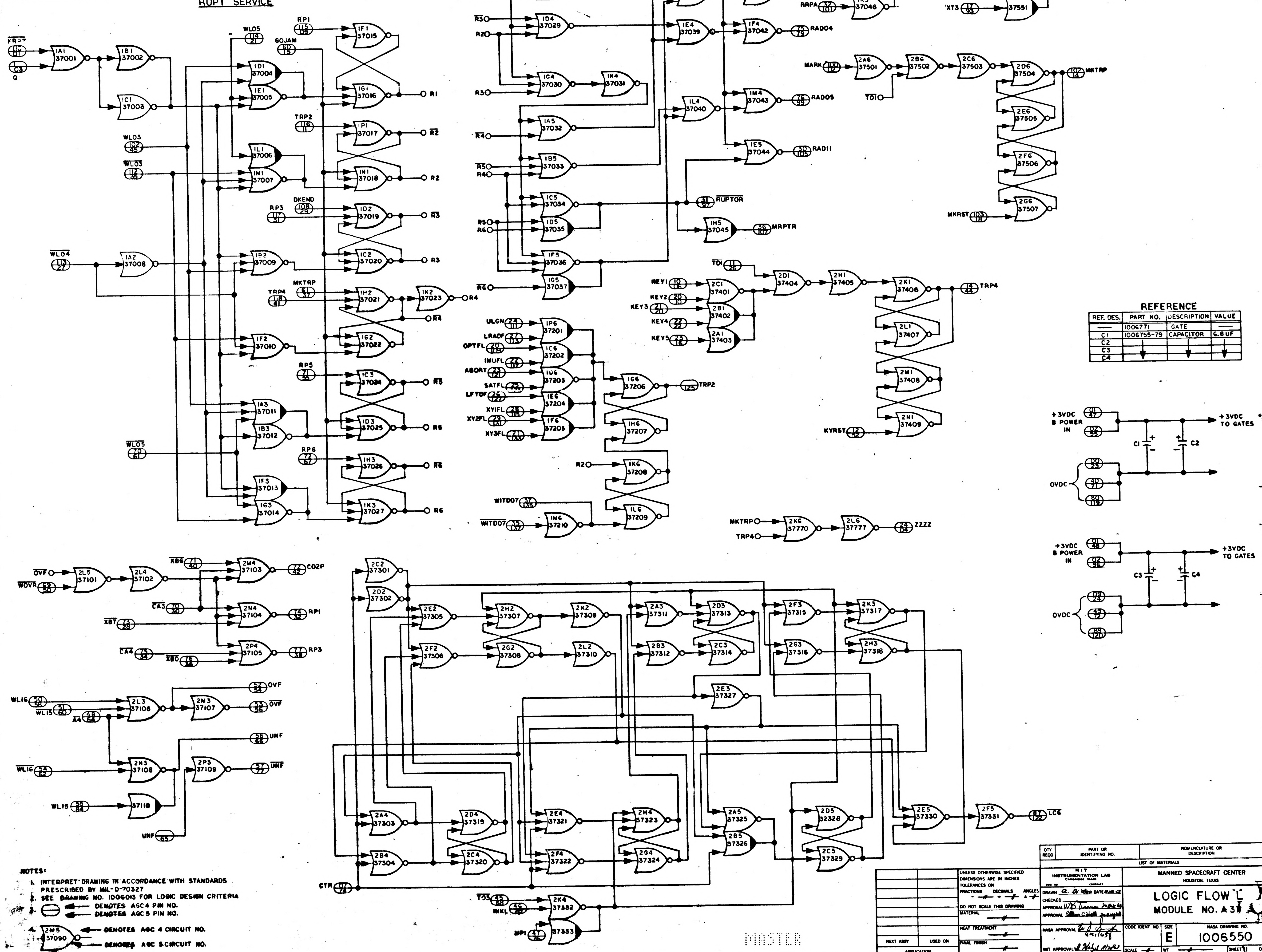
LOGIC FLOW "J"
LOGIC MODULE NO. A26

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006549
SCALE — WT — SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS DRR 02694			
SYM	DESCRIPTION	DATE	APPROVAL

RUPT SERVICE



KRPT
Q
WL05
RP1
GOJAM
TRP2
WL03
RP3
DKEND
WL04
MKTRP
TRP4
RP5
RP6
R1
R2
R3
R4
R5
R6
RADO3
RADO4
RADO5
RAD11
RRPA
RUPTOR
MRPTR
CAGEN
STO6
XT3
NHPT
MARK
T01
MKRST
KEY1
KEY2
KEY3
KEY4
KEY5
KYRST
ULGN
LRADF
OPTFL
IMUFL
ABORT
SATFL
LFTOF
XYIFL
XY2FL
XY3FL
TRP2
WITD07
ZZZZ
OVF
WOVR
XB6
CA3
XB7
CA4
XB0
CO2P
WL16
WL15
A4
UNF
CTR
T03
INKL
MPI
LC6
+3VDC B POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3			
C4			

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 37090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN A. B. Lee DATE AUG 63
CHECKED
APPROVAL W B Duncan 20 Aug 63
APPROVAL Eldon C Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "L"
MODULE NO. A31

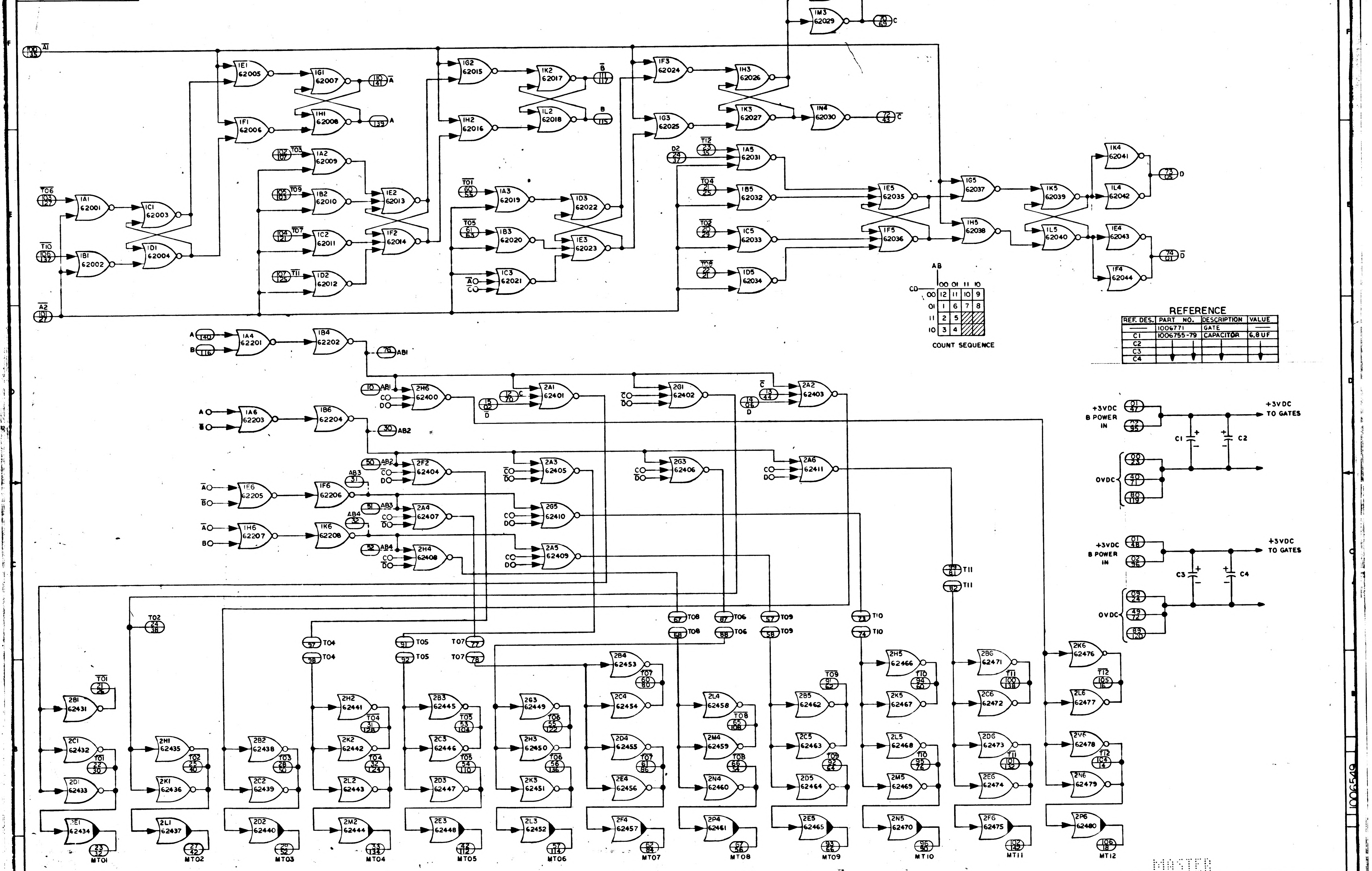
CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006550
SCALE — | WT — | SHEET 1 OF 1

1006550

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS TDRR 02694			
SYM	DESCRIPTION	DATE	APPROVAL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1K2 62017
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1L3 62028
1M3 62029
1N4 62030
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1B5 62032
1C5 62033
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2G3 62406
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2H4 62408
2A5 62409
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2K1 62436
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2D2 62440
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2D6 62473
2E6 62474
2F6 62475
2K6 62476
2L6 62477
2M6 62478
2N6 62479
2P6 62480
MT01
MT02
MT03
MT04
MT05
MT06
MT07
MT08
MT09
MT10
MT11
MT12
+3VDC B POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4

CD \ AB	00	01	11	10
00	12	11	10	9
01	1	6	7	8
11	2	5	▨	▨
10	3	4	▨	▨

COUNT SEQUENCE

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 62090 ← DENOTES AGC4 CIRCUIT NO. ← DENOTES AGC5 CIRCUIT NO.

TIME PULSE GENERATOR
IT COUNTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN C.P. Kaufenberg DATE
CHECKED
APPROVAL W.B. Turner 20 Aug 63
APPROVAL Eldon C. Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "J"
LOGIC MODULE NO. A26

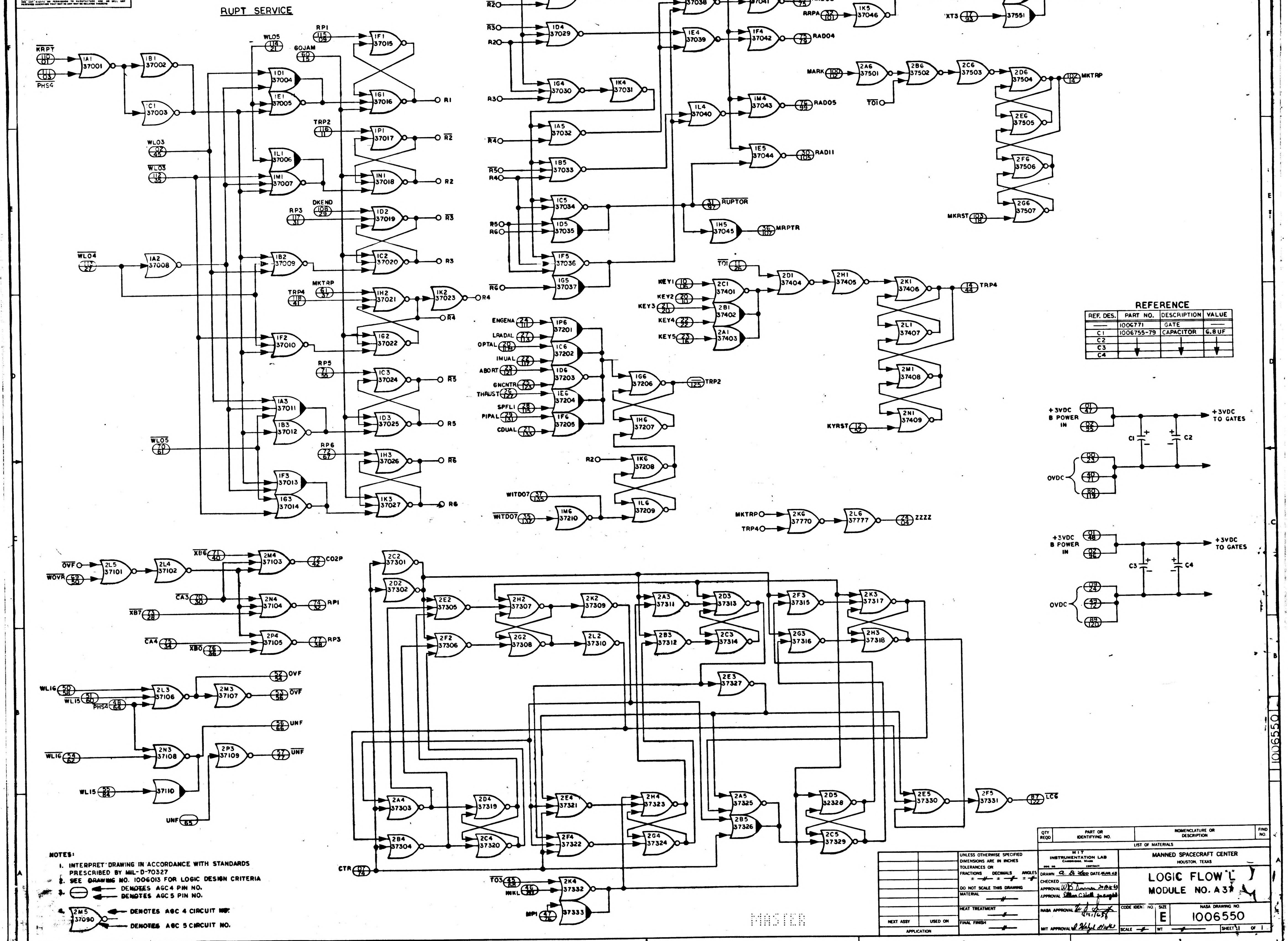
CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006549
SCALE —
WT —
SHEET 1 OF 1

1006549

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 02694			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03597	10-3-63	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KRPT
PHS4
1A1 37001
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1C1 37003
WL05
60JAM
RP1
1F1 37015
1D1 37004
1E1 37005
1G1 37016
R1
TRP2
1P1 37017
R2
WL03
1L1 37006
1M1 37007
1N1 37018
RP3
DKEND
1D2 37019
R3
WL04
1A2 37008
1B2 37009
1C2 37020
MKTRP
TRP4
1H2 37021
1K2 37023
R4
1F2 37010
1G2 37022
RP5
1C3 37024
1A3 37011
1B3 37012
1D3 37025
R5
RP6
1H3 37026
R6
1F3 37013
1G3 37014
1K3 37027
R1
R2
R3
1A4 37028
1D4 37029
1B4 37038
1E4 37039
1C4 37041
1F4 37042
RAD03
RRPA
1K5 37046
RAD04
1G4 37030
1K4 37031
1L4 37040
1M4 37043
RAD05
R4
1A5 37032
1E5 37044
RADII
R5
1B5 37033
1C5 37034
RUPTOR
R6
1D5 37035
1H5 37045
MRPTR
1F5 37036
1G5 37037
ENGENA
LRADAL
OPTAL
IMUAL
ABORT
GNCNTR
THRUST
SPFLI
PIPAL
CDUAL
1P6 37201
1C6 37202
1D6 37203
1E6 37204
1F6 37205
1G6 37206
TRP2
1H6 37207
1K6 37208
1L6 37209
WITD07
1M6 37210
CAGEN
ST06
XT3
2N2 37560
37551
NHPT
MARK
2A6 37501
2B6 37502
2C6 37503
2D6 37504
MKTRP
T01
2E6 37505
2F6 37506
2G6 37507
MKRST
KEY1
KEY2
KEY3
KEY4
KEY5
2C1 37401
2B1 37402
2A1 37403
2D1 37404
2H1 37405
2K1 37406
TRP4
2L1 37407
2M1 37408
2N1 37409
KYRST
MKTRP
TRP4
2K6 37770
2L6 37777
ZZZZ
+3VDC B POWER IN
+3VDC TO GATES
C1
C2
OVDC
C3
C4
OVF
WOVR
2L5 37101
2L4 37102
XB6
2M4 37103
C02P
CA3
2N4 37104
RP1
XB7
CA4
XB0
2P4 37105
RP3
WL16
WL15
PHS4
2L3 37106
2M3 37107
OVF
UNF
2N3 37108
2P3 37109
37110
UNF
2C2 37301
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2F5 37331
LC6
CTR
T03
INKL
MP1
2K4 37332
37333
MASTER

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3			
C4			

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 37090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN A. B. Leo DATE
CHECKED
APPROVAL W B Turner 20 Aug 63
APPROVAL
NASA APPROVAL 8/21/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "L"
MODULE NO. A31

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006550
SCALE — | WT — | SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 02694			
SYM	DESCRIPTION	DATE	APPROVAL
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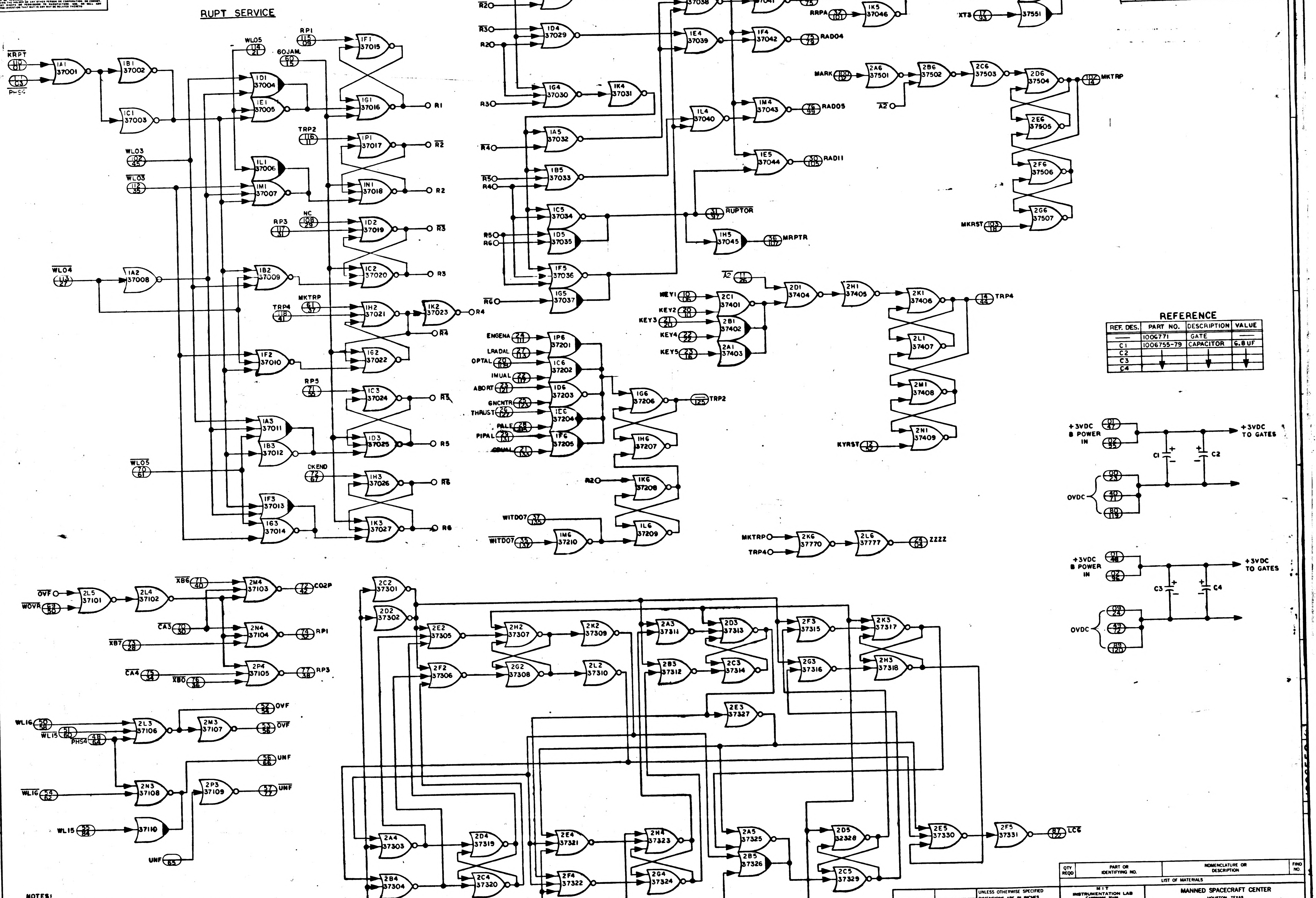
B	REVISED PER TDRR 06756	Jan 64	W/K
C	REVISED PER TDRR 06021		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1C1 37003
WL05
1D1 37004
1E1 37005
60JAM
RP1
1F1 37015
1G1 37016
R1
TRP2
1P1 37017
R2
WL03
1L1 37006
1M1 37007
1N1 37018
R2
RP3
NC
1D2 37019
R3
WL04
1A2 37008
1B2 37009
1C2 37020
R3
MKTRP
TRP4
1H2 37021
1K2 37023
R4
R4
1F2 37010
1G2 37022
RP5
1C3 37024
R5
1A3 37011
1B3 37012
1D3 37025
R5
WL05
DKEND
1H3 37026
R6
1F3 37013
1G3 37014
1K3 37027
R6
R1
R2
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R3
R2
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1B5 37033
R5
R4
1C5 37034
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R6
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1L4 37040
1M4 37043
RAD05
1E5 37044
RAD11
RUPTOR
1H5 37045
MRPTR
CAGEN
STO6
2N2 37550
NHPT
XT3
37551
MARK
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2B6 37502
2C6 37503
2D6 37504
MKTRP
A2
2E6 37505
2F6 37506
MKRST
2G6 37507
ENGENA
1P6 37201
LRADAL
OPTAL
1C6 37202
IMUAL
ABORT
1D6 37203
GNCNTR
THRUST
1E6 37204
PALE
PIPAL
1F6 37205
CDUAL
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TRP2
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R2
1K6 37208
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WITDO7
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1L6 37209
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KEY2
KEY3
2B1 37402
KEY4
KEY5
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2D1 37404
2H1 37405
2K1 37406
TRP4
2L1 37407
2M1 37408
KYRST
2N1 37409
MKTRP
TRP4
2K6 37770
2L6 37777
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+3VDC B POWER IN
+3VDC TO GATES
C1
C2
OVDC
+3VDC B POWER IN
+3VDC TO GATES
C3
C4
OVDC
OVF
WOVR
2L5 37101
2L4 37102
XB6
2M4 37103
CO2P
CA3
2N4 37104
RP1
XB7
CA4
XB0
2P4 37105
RP3
WL16
WL15
PHS4
2L3 37106
2M3 37107
OVF
OVF
UNF
WL16
2N3 37108
2P3 37109
UNF
WL15
37110
UNF
2C2 37301
2D2 37302
2E2 37305
2F2 37306
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2F3 37315
2G3 37316
2K3 37317
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2A4 37303
2B4 37304
2D4 37319
2C4 37320
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2F4 37322
2H4 37323
2G4 37324
2A5 37325
2B5 37326
2D5 37328
2C5 37329
2E5 37330
2F5 37331
LC6
CTR
T03
INKL
MPI
2K4 37332
37333
MASTER

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 37090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DSG NO CONTRACT
DRAWN Q. B. Lee DATE
CHECKED
APPROVAL W B Turner 20 Aug 63
APPROVAL Elden C Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL D Hoag 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

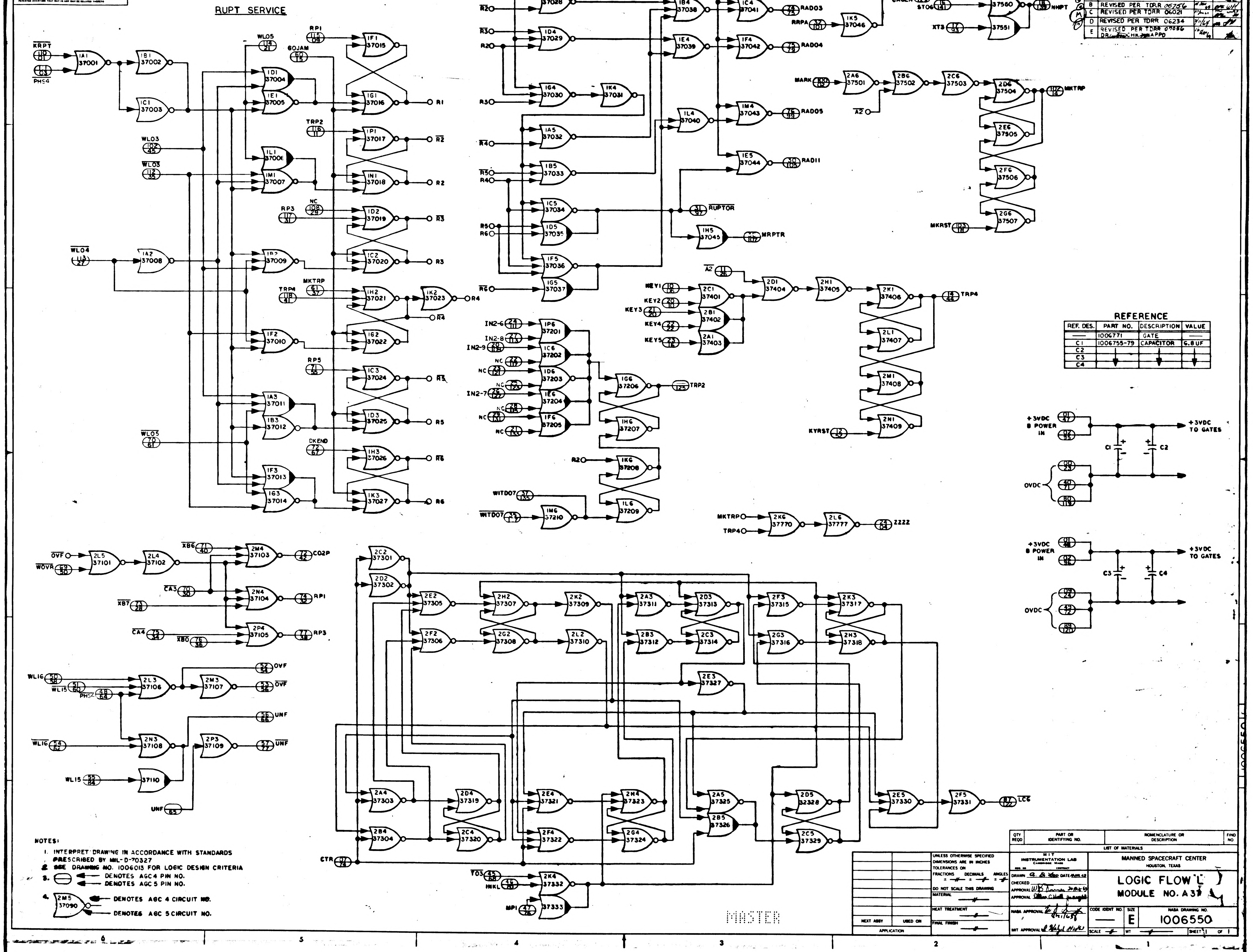
LOGIC FLOW "L"
MODULE NO. A3

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006550
SCALE — WT — SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03597	10-3-63	
B	REVISED PER TDRR 06756	Jan 64	W/K
C	REVISED PER TDRR 06021	23 Jan 64	
D	REVISED PER TDRR 06234	3/11/64	
E	REVISED PER TDRR 07056 DR CHK APPD	16 Apr 64	



RUPT SERVICE
KRPT
PHS4
WL05
WL03
WL04
RP1
GOJAM
TRP2
RP3
NC
TRP4
MKTRP
RP5
DKEND
R1
R2
R3
R4
R5
R6
RADO3
RADO4
RADO5
RAD11
RRPA
RUPTOR
MRPTR
CAGEN
STO6
XT3
NHPT
MARK
MKRST
KEY1
KEY2
KEY3
KEY4
KEY5
KYRST
IN2-6
IN2-8
IN2-9
IN2-7
WITDO7
MKTRP
TRP4
ZZZZ
+3VDC B POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4
OVF
WOVR
XB6
XB7
XB0
CA3
CA4
CO2P
WL16
WL15
PHS4
UNF
CTR
T03
INKL
MPI
LC6
MASTER

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2	↓	↓	↓
C3			
C4			

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
4. 2M5 37090 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN A. B. Leo DATE 4 Jun 63
CHECKED
APPROVAL W B Tanner 20 Aug 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "L"
MODULE NO. A3

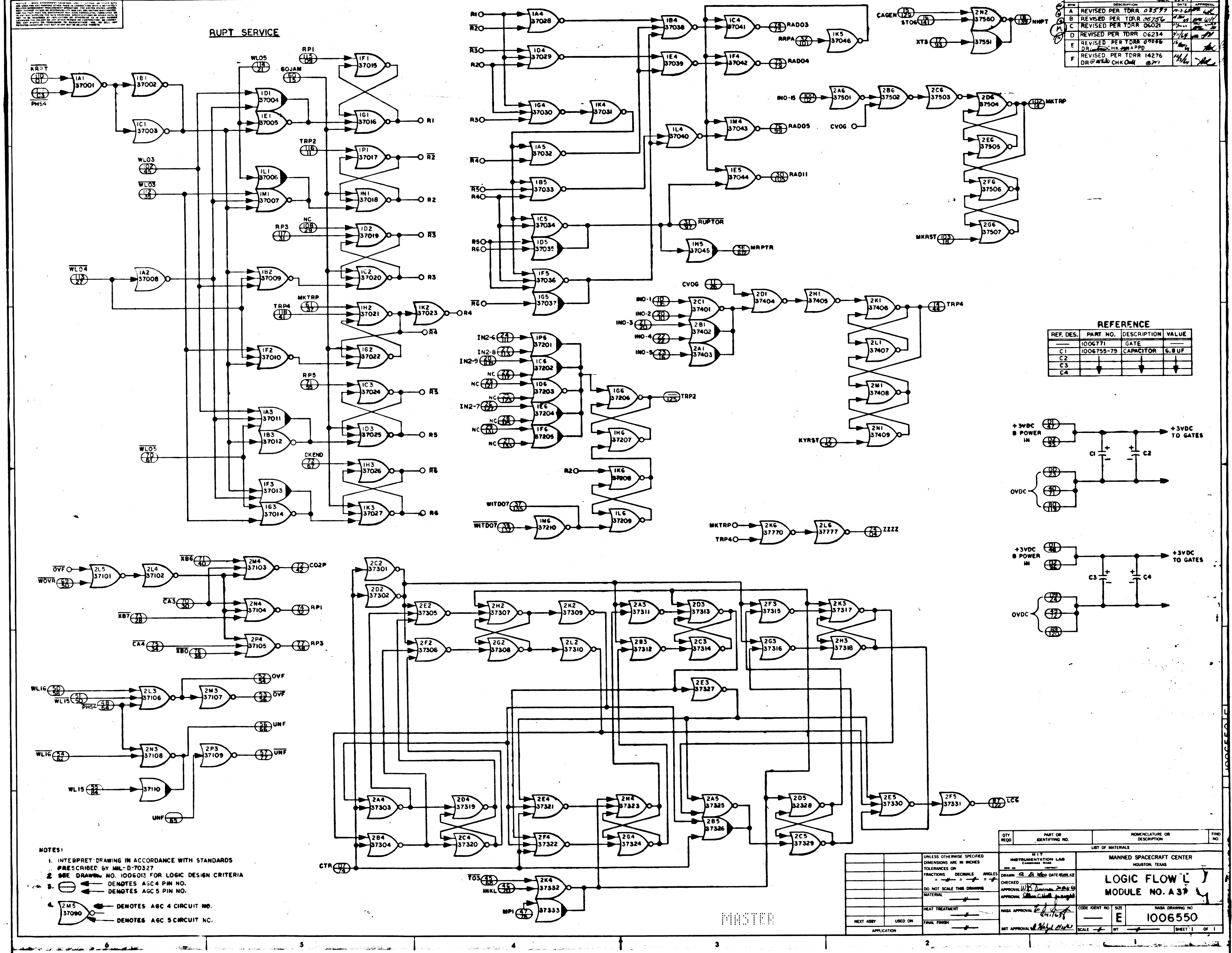
CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006550
SCALE —
WT —
SHEET 1 OF 1

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS TDRR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03597	10-3-63	WK
B	REVISED PER TDRR 05756	21 Jan 64	WK
C	REVISED PER TDRR 06021	27 Jan 64	
D	REVISED PER TDRR 06234	3/11/64	
E	REVISED PER TDRR 07056 DR CHK APPD	16 Nov 64	
F	REVISED PER TDRR 14276 DR CHK	12/23/64	

RUPT SERVICE



KRPT
110 / 01
PHS4
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1C1 37003
WL05 114 / 21
RP1 115 / 09
GOJAM 60 / 15
1D1 37004
1E1 37005
1F1 37015
1G1 37016
R1
TRP2 116 / 11
1P1 37017
R2
WL03 102 / 45
WL03 112 / 35
1L1 37006
1M1 37007
1N1 37018
R2
RP3 117 / 31
NC 108 / 29
1D2 37019
R3
WL04 113 / 27
1A2 37008
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1C2 37020
R3
MKTRP 61 / 37
TRP4 118 / 41
1H2 37021
1K2 37023
R4
R4
1F2 37010
1G2 37022
RP5 71 / 95
1C3 37024
R5
1A3 37011
1B3 37012
1D3 37025
R5
WL05 70 / 61
CKEND 72 / 67
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R6
1F3 37013
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R6
R1
R2
1A4 37028
R3
R2
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R4
1A5 37032
R5
R4
1B5 37033
1C5 37034
R5
R6
1D5 37035
1F5 37036
1G5 37037
R6
1B4 37038
1E4 37039
1L4 37040
1C4 37041
RAD03 74 / 72
1F4 37042
RAD04 73 / 78
RRPA 32 / 101
1K5 37046
1M4 37043
RAD05 76 / 99
1E5 37044
RAD11 30 / 105
RUPTOR 31 / 97
1N5 37045
MRPTR 36 / 107
CAGEN 15 / 129
STOG 16 / 141
2N2 37560
NHPT 18 / 139
XT3 17 / 93
37551
IN0-15 103 / 112
2A6 37501
2B6 37502
2C6 37503
2D6 37504
MKTRP 102 / 14
CVOG
2E6 37505
2F6 37506
2G6 37507
MKRST 103 / 18
CVOG 11 / 26
2D1 37404
2H1 37405
IN0-1 10 / 16
IN0-2 20 / 10
IN0-3 21 / 20
IN0-4 22 / 14
IN0-5 23 / 16
2C1 37401
2B1 37402
2A1 37403
2K1 37406
TRP4 14 / 44
2L1 37407
2M1 37408
2N1 37409
KYRST 12 / 32
IN2-6 24 / 111
IN2-8 27 / 113
IN2-9 29 / 116
NC
IN2-7
NC
NC
NC
1P6 37201
1C6 37202
1D6 37203
1E6 37204
1F6 37205
1G6 37206
TRP2 125
1H6 37207
R2
1K6 37208
WITD07 37 / 135
WITD07 38 / 130
1M6 37210
1L6 37209
MKTRP
TRP4
2K6 37770
2L6 37777
ZZZZ 24 / 04
+3VDC B POWER IN 01 / 47
02 / 95
+3VDC TO GATES
C1
C2
OVDC 00 / 23
40 / 71
80 / 119
+3VDC B POWER IN 01 / 48
02 / 96
+3VDC TO GATES
C3
C4
OVDC 09 / 24
49 / 72
89 / 120
OVF
WOVR 63 / 50
2L5 37101
2L4 37102
XB6 71 / 40
2M4 37103
CO2P 72 / 42
CA3 70 / 30
2N4 37104
RP1 74 / 32
XB7 73 / 28
CA4 75 / 34
XB0 76 / 36
2P4 37105
RP3 77 / 38
WL16 50 / 58
WL15 51 / 50
PHS4 48 / 64
2L3 37106
2M3 37107
OVF 52 / 54
OVF 53 / 56
UNF 56 / 66
WL16 54 / 62
2N3 37108
2P3 37109
UNF 57 / 77
WL15 52 / 84
37110
UNF 65
2C2 37301
2D2 37302
2E2 37305
2F2 37306
2H2 37307
2G2 37308
2K2 37309
2L2 37310
2A3 37311
2B3 37312
2D3 37313
2C3 37314
2F3 37315
2G3 37316
2K3 37317
2H3 37318
2E3 37327
2A4 37303
2B4 37304
2D4 37319
2C4 37320
2E4 37321
2F4 37322
2H4 37323
2G4 37324
2A5 37325
2B5 37326
2D5 37328
2C5 37329
2E5 37330
2F5 37331
LC6 87 / 122
CTR 07 / 74
T03 45 / 68
INKL 46 / 70
MPI 47 / 76
2K4 37332
37333
MASTER
6
5
4
3
2
1

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 37090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN A. B. Leo DATE
CHECKED
APPROVAL W.B. Duncan
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "L" MODULE NO. A37

CODE IDENT NO. — SIZE E NASA DRAWING NO 1006550
SCALE — WT — SHEET 1 OF 1

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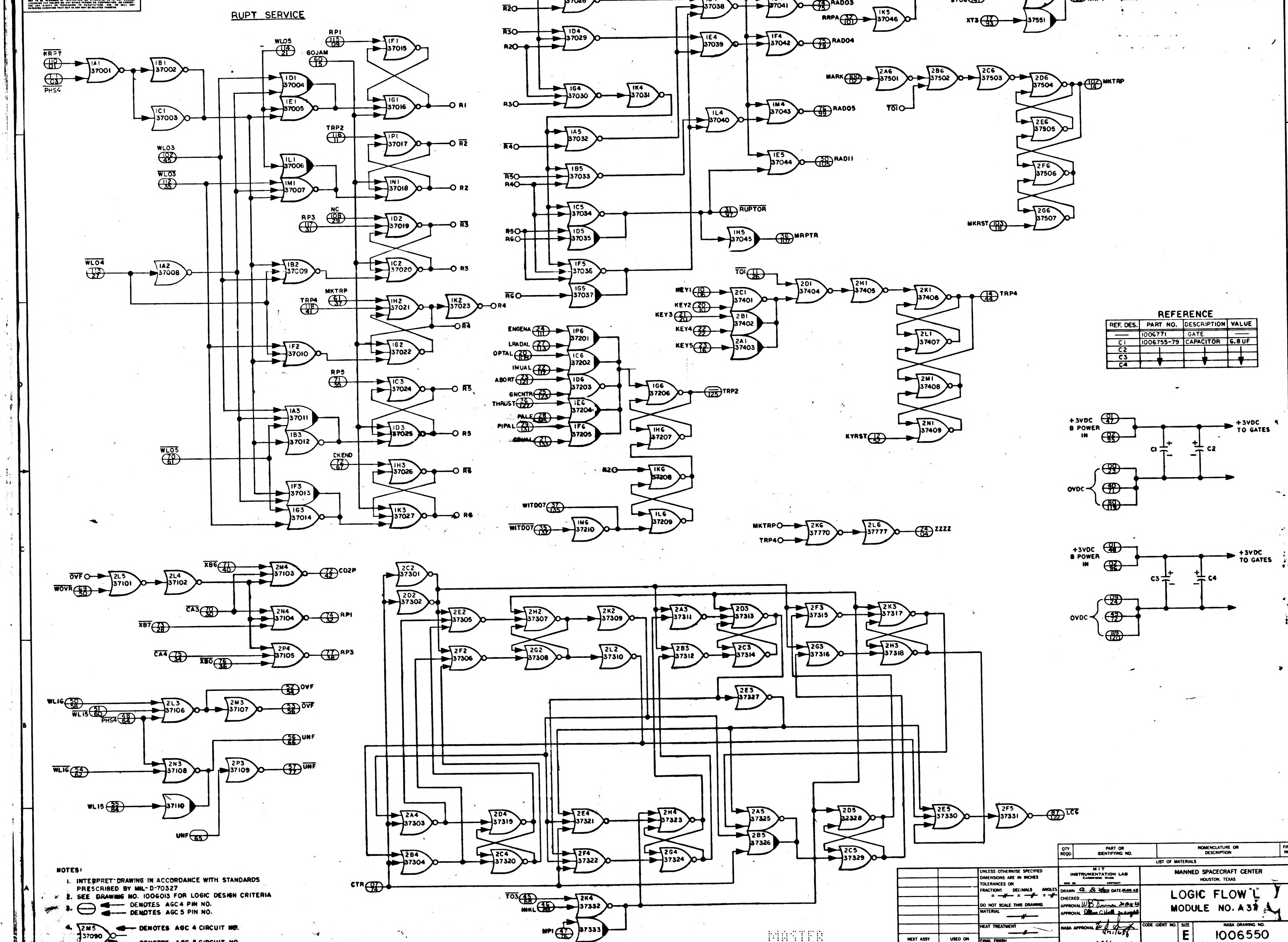
REVISIONS TDRR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03597	10-3-63	WK
B	REVISED PER TDRR 06756	Jan 63	WK

RUPT SERVICE


6
5
4
3
2
1
KRPT 110/01
PHS4 03
1A1 37001
1B1 37002
1C1 37003
WL05 114/21
60JAM 60/15
RP1 115/09
1D1 37004
1E1 37005
1F1 37015
1G1 37016
R1
TRP2 116/11
1P1 37017
R2
WL03 102/45
WL03 112/35
1L1 37006
1M1 37007
1N1 37018
R2
NC 108/29
RP3 117/31
1D2 37019
R3
WL04 113/27
1A2 37008
1B2 37009
1C2 37020
R3
MKTRP 61/37
TRP4 118/41
1H2 37021
1K2 37023
R4
R4
1F2 37010
1G2 37022
RP5 71/55
1C3 37024
R5
1A3 37011
1B3 37012
1D3 37025
R5
WL05 70/61
CKEND 72/67
1H3 37026
R6
1F3 37013
1G3 37014
1K3 37027
R6
R1
R2
R3
R2
1A4 37028
1D4 37029
1G4 37030
1K4 37031
R3
R4
1A5 37032
R5
R4
1B5 37033
1C5 37034
R5
R6
1D5 37035
1F5 37036
R6
1G5 37037
1B4 37038
1E4 37039
1L4 37040
1C4 37041
74/75 RAD03
RRPA 32/101
1K5 37046
1F4 37042
75/79 RAD04
1M4 37043
76/99 RAD05
1E5 37044
30/105 RAD11
31/97 RUPTOR
1H5 37045
36/107 MRPTR
CAGEN 15/129
ST06 16/141
2N2 37560
18/139 NHPT
XT3 17/93
37551
MARK 100/02
2A6 37501
2B6 37502
2C6 37503
2D6 37504
102/14 MKTRP
T01
2E6 37505
2F6 37506
2G6 37507
MKRST 103/18
T01 11/26
KEY1 10/06
KEY2 20/10
KEY3 21/20
KEY4 22/22
KEY5 23/16
2C1 37401
2B1 37402
2A1 37403
2D1 37404
2H1 37405
2K1 37406
14/44 TRP4
2L1 37407
2M1 37408
2N1 37409
KYRST 12/52
ENGENA 24/111
LRADAL 27/113
OPTAL 20/109
IMUAL 22/117
ABORT 23/121
GNCNTR 25/123
THRUST 26/127
PALE 28/105
PIPAL 29/131
CDUAL 21/133
1P6 37201
1C6 37202
1D6 37203
1E6 37204
1F6 37205
1G6 37206
125 TRP2
1H6 37207
R2
1K6 37208
WITD07 37/135
WITD07 35/137
1M6 37210
1L6 37209
MKTRP
TRP4
2K6 37770
2L6 37777
24/04 ZZZZ
+3VDC B POWER IN 01/47
02/95
+3VDC TO GATES
C1
C2
0VDC 00/23
40/71
80/119
+3VDC B POWER IN 01/48
02/96
+3VDC TO GATES
C3
C4
0VDC 09/24
49/72
89/120
OVF
WOVR 69/50
2L5 37101
2L4 37102
XB6 71/40
2M4 37103
72/42 C02P
CA3 70/30
2N4 37104
74/32 RP1
XB7 73/28
CA4 75/34
XB0 76/36
2P4 37105
77/38 RP3
WL16 50/58
WL15 51/60
PHS4 48/64
2L3 37106
52/54 OVF
2M3 37107
53/56 OVF
56/66 UNF
WL16 54/62
2N3 37108
2P3 37109
57/77 UNF
WL15 55/84
37110
UNF 65
2C2 37301
2D2 37302
2E2 37305
2F2 37306
2H2 37307
2G2 37308
2K2 37309
2L2 37310
2A3 37311
2B3 37312
2D3 37313
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2G3 37316
2K3 37317
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2F4 37322
2H4 37323
2G4 37324
2A5 37325
2B5 37326
2D5 37328
2C5 37329
2E5 37330
2F5 37331
87/122 LC6
CTR 07/74
T03 45/68
MKL 46/78
2K4 37332
MPI 47/76
37333

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3			
C4			

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO.
   ← DENOTES AGC 5 PIN NO.
4. 2M5 ← DENOTES AGC 4 CIRCUIT NO.
   37090 ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN A. Di Leo DATE [illegible] 63
CHECKED
APPROVAL W B Damon 20 Aug 63
APPROVAL Elmer C Hall 20 Aug 63
NASA APPROVAL [illegible] 8/21/63
MIT APPROVAL [illegible] 8/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "L"
MODULE NO. A34

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006550
SCALE — WT — SHEET 1 OF 1

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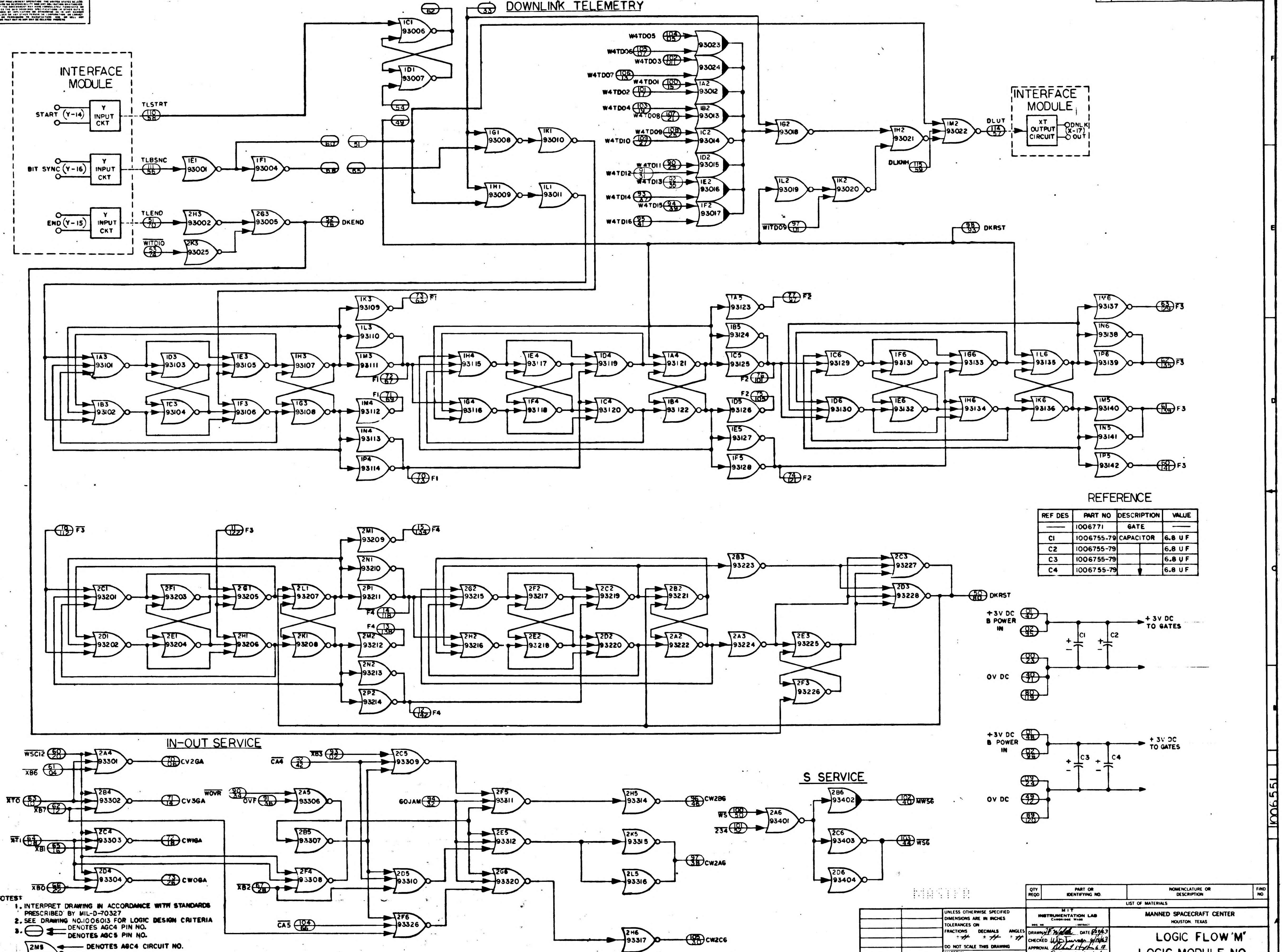
SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS TDRR 1607			


DOWNLINK TELEMETRY
INTERFACE MODULE
START (Y-14)
BIT SYNC (Y-16)
END (Y-15)
Y INPUT CKT
TLSTRT
TLBSNC
TLEND
W1TD10
DKEND
W4TD01
W4TD02
W4TD03
W4TD04
W4TD05
W4TD06
W4TD07
W4TD08
W4TD09
W4TD10
W4TD11
W4TD12
W4TD13
W4TD14
W4TD15
W4TD16
W1TD09
DLKNH
DLUT
XT OUTPUT CIRCUIT
DNLK (X-17) OUT
DKRST
F1
F2
F3
F4
+3V DC B POWER IN
+3V DC TO GATES
0V DC
C1
C2
C3
C4
IN-OUT SERVICE
WSC12
XB6
XT0
XB7
XT1
XB1
XB0
CV2GA
CV3GA
CW1GA
CW0GA
CA4
XB3
WOVR
OVF
XB2
CA5
GOJAM
CW2B6
CW2A6
CW2C6
S SERVICE
W5
234
MWS6
WS6

REFERENCE

REF DES	PART NO	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 U F
C2	1006755-79		6.8 U F
C3	1006755-79		6.8 U F
C4	1006755-79		6.8 U F

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO.1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ DENOTES AGC4 PIN NO. DENOTES AGC5 PIN NO.

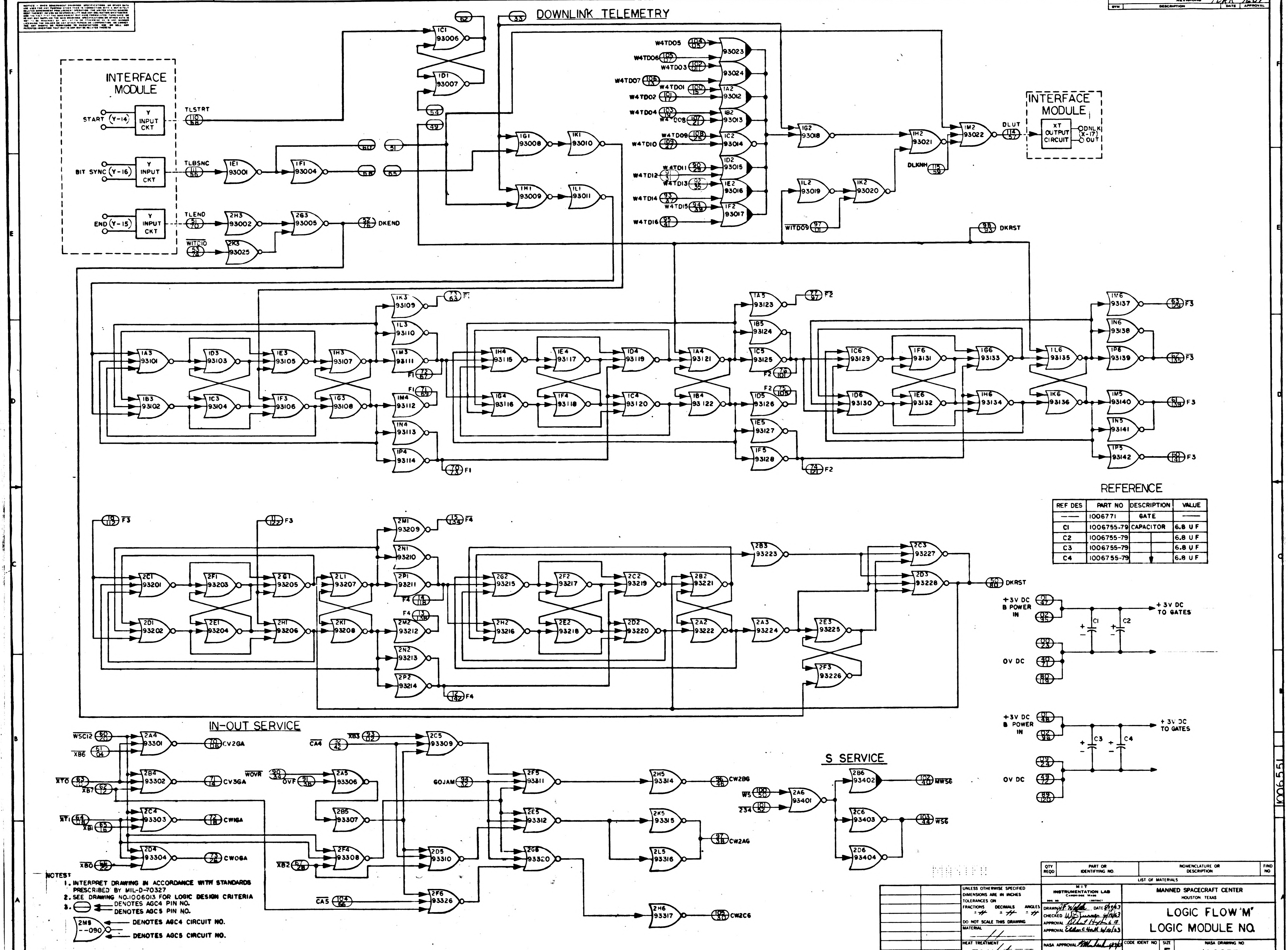
2MS --090 DENOTES AGC4 CIRCUIT NO. DENOTES AGC5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± // DECIMALS ± // ANGLES ± // DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE MASS	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL //	DRAWN J F Walsh DATE 5/29/63 CHECKED W B Turner 6/14/63 APPROVAL Albert Hopkins 6 17 APPROVAL Eldon C Hall 6/18/63	LOGIC FLOW 'M' LOGIC MODULE NO.
		HEAT TREATMENT //	NASA APPROVAL	CODE IDENT NO. SIZE E NASA DRAWING NO. 1006551
		FINAL FINISH //	MIT APPROVAL	SCALE WT SHEET OF

1006551

INCHES
PHOTOGRAPHIC SCALE ONLY


DOWNLINK TELEMETRY
INTERFACE MODULE
START (Y-14)
BIT SYNC (Y-16)
END (Y-15)
Y INPUT CKT
TLSTRT
TLBSNC
TLEND
WITC10
DKEND
W4TD05
W4TD06
W4TD03
W4TD07
W4TD01
W4TD02
W4TD04
W4TD08
W4TD09
W4TD10
W4TD11
W4TD12
W4TD13
W4TD14
W4TD15
W4TD16
WITD09
DKRST
DLUT
DLKNH
XT OUTPUT CIRCUIT
DNLK (X-17) OUT
F1
F2
F3
F4
+3V DC B POWER IN
+3V DC TO GATES
OV DC
C1
C2
C3
C4
IN-OUT SERVICE
S SERVICE
WSC12
XB6
XT0
XB7
XT1
XB1
XB0
CV2GA
CV3GA
CW1GA
CW0GA
CA4
XB3
WOVR
OVF
GOJAM
XB2
CA5
CW2B6
CW2AG
CW2C6
WS
234
MWS6
WS6

REFERENCE

REF DES	PART NO	DESCRIPTION	VALUE
——	1006771	GATE	——
C1	1006755-79	CAPACITOR	6.8 U F
C2	1006755-79		6.8 U F
C3	1006755-79		6.8 U F
C4	1006755-79	↓	6.8 U F

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO.1006013 FOR LOGIC DESIGN CRITERIA
3. DENOTES AGC4 PIN NO.
DENOTES AGC5 PIN NO.
2M8 --090 DENOTES AGC4 CIRCUIT NO.
DENOTES AGC5 CIRCUIT NO.

REVISIONS TLRR 1607

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± / DECIMALS ± / ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —/ /—
HEAT TREATMENT —/ /—
FINAL FINISH / /

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DRAWN J.F. Walsh DATE 5/29/63
CHECKED W.B. Turner 6/18/63
APPROVAL Albert Hopkins 6/17
APPROVAL Eldon C Hall 6/18/63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'M'
LOGIC MODULE NO.

CODE IDENT NO | SIZE E | NASA DRAWING NO. 1006551
SCALE | WT | SHEET OF

1006551

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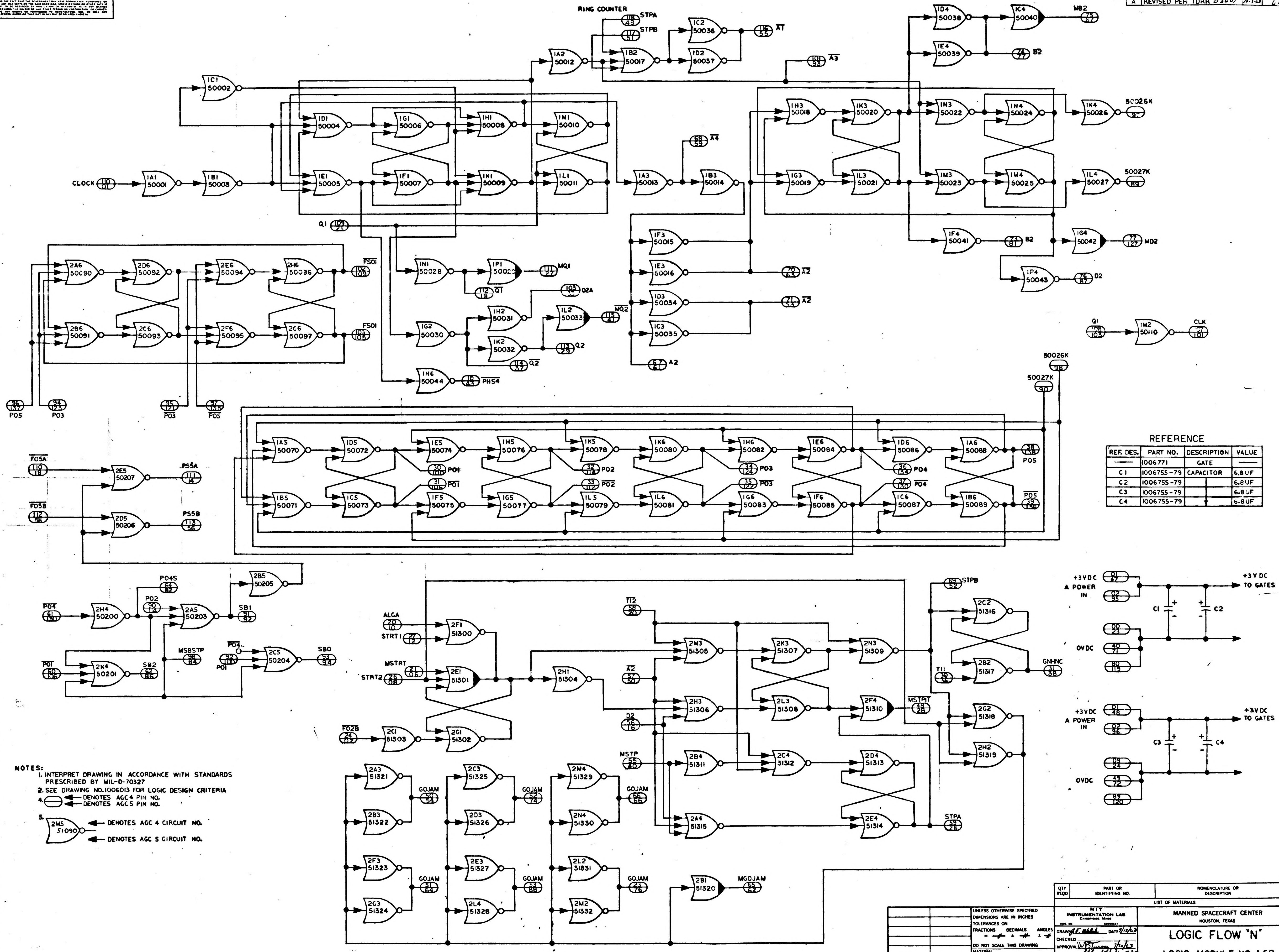
REVISIONS TDRR 02262

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03601	10-3-63	WK


RING COUNTER
CLOCK
1A1 50001
1B1 50003
1C1 50002
1D1 50004
1E1 50005
1G1 50006
1F1 50007
1H1 50008
1K1 50009
1M1 50010
1L1 50011
1A2 50012
1B2 50017
1C2 50036
1D2 50037
STPA
STPB
AT
A3
A4
1A3 50013
1B3 50014
1H3 50018
1G3 50019
1K3 50020
1L3 50021
1N3 50022
1M3 50023
1N4 50024
1M4 50025
1K4 50026
1L4 50027
50026K
50027K
1D4 50038
1E4 50039
1C4 50040
MB2
B2
1F3 50015
1E3 50016
1D3 50034
1C3 50035
A2
1F4 50041
1G4 50042
MD2
1P4 50043
D2
Q1
1N1 50028
1P1 50029
MQ1
1G2 50030
1H2 50031
1K2 50032
1L2 50033
MQ2
Q2A
Q2
1N6 50044
PHS4
1M2 50110
CLK
2A6 50090
2B6 50091
2D6 50092
2C6 50093
2E6 50094
2F6 50095
2H6 50096
2G6 50097
FS01
P05
P03
1A5 50070
1B5 50071
1D5 50072
1C5 50073
1E5 50074
1F5 50075
1H5 50076
1G5 50077
1K5 50078
1L5 50079
1K6 50080
1L6 50081
1H6 50082
1G6 50083
1E6 50084
1F6 50085
1D6 50086
1C6 50087
1A6 50088
1B6 50089
P01
P02
P03
P04
P05
F05A
F05B
2E5 50207
2D5 50206
PS5A
PS5B
P04S
P04
2H4 50200
2A5 50203
2B5 50205
SB1
P02
P01
2K4 50201
SB2
MSBSTP
2C5 50204
SB0
ALGA
STRT1
MSTRT
STRT2
2F1 51300
2E1 51301
2G1 51302
2C1 51303
F02B
2H1 51304
T12
A2
D2
MSTP
2M3 51305
2H3 51306
2K3 51307
2L3 51308
2N3 51309
2F4 51310
2B4 51311
2C4 51312
2D4 51313
2E4 51314
2A4 51315
2C2 51316
2B2 51317
2G2 51318
2H2 51319
STPB
STPA
T11
GNHNC
MSTPIT
2A3 51321
2B3 51322
2F3 51323
2G3 51324
2C3 51325
2D3 51326
2E3 51327
2L4 51328
2M4 51329
2N4 51330
2L2 51331
2M2 51332
GOJAM
2B1 51320
MGOJAM
+3VDC A POWER IN
+3V DC TO GATES
C1
C2
C3
C4
0VDC

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2	1006755-79	↓	6.8UF
C3	1006755-79	↓	6.8UF
C4	1006755-79	↓	6.8UF

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO.1006013 FOR LOGIC DESIGN CRITERIA
4. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
5. 2M5 51090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING
MATERIAL #
HEAT TREATMENT #
FINAL FINISH #

MIT INSTRUMENTATION LAB
Cambridge, Mass
DWG. NO. CONTRACT
DRAWN J.F. [illegible] DATE 7/18/63
CHECKED
APPROVAL W.B. [illegible] 7/30/63
APPROVAL Albert Hopkins 7.30
NASA APPROVAL W.J. [illegible] 7-31-63
MIT APPROVAL [illegible] 7/30/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'N'

LOGIC MODULE NO. A28

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006552
SCALE # | WT # | SHEET 1 OF 1

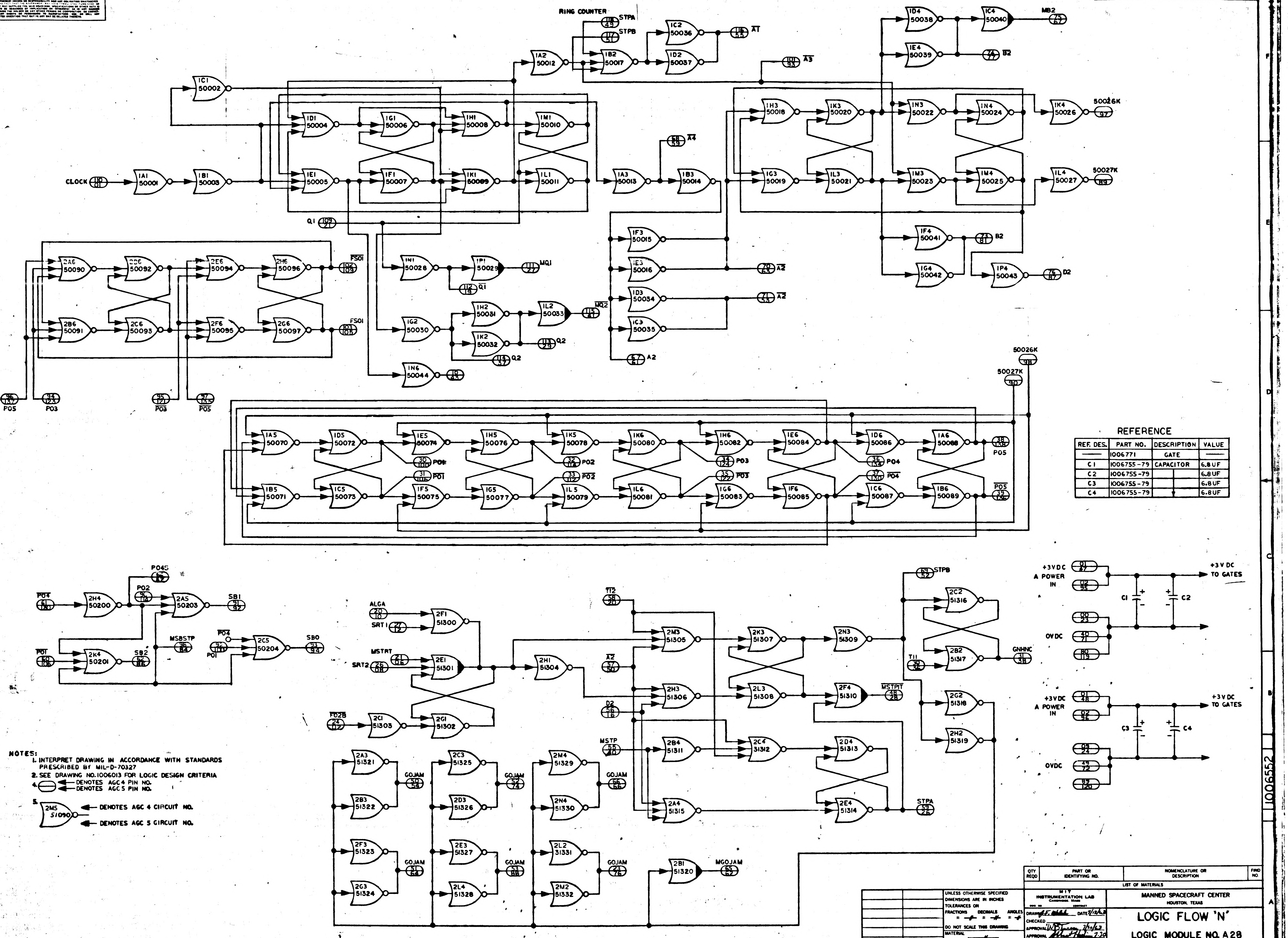
MASTER

1006552 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL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1L1 50011
1A2 50012
1B2 50017
1C2 50036
1D2 50037
STPA
STPB
1A3 50013
1B3 50014
1H3 50018
1G3 50019
1K3 50020
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1N3 50022
1M3 50023
1N4 50024
1M4 50025
1K4 50026
1L4 50027
50026K
50027K
1D4 50038
1E4 50039
1C4 50040
MB2
B2
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A4
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A2
1F4 50041
1G4 50042
1P4 50043
D2
Q1
1N1 50028
1P1 50029
MQ1
1G2 50030
1H2 50031
1K2 50032
1L2 50033
MQ2
Q2
1N6 50044
2A6 50090
2B6 50091
2C6 50092
2C6 50093
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P05
P03
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P02
P04
P04
P045
2H4 50200
2K4 50201
2A5 50203
2C5 50204
SB1
SB2
SB0
MSBSTP
ALGA
SRT1
SRT2
MSTRT
2F1 51300
2E1 51301
2G1 51302
2C1 51303
F02B
2H1 51304
T12
T11
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2K3 51307
2L3 51308
2N3 51309
2F4 51310
MSTPIT
2B4 51311
2C4 51312
2D4 51313
2E4 51314
2A4 51315
MSTP
2C2 51316
2B2 51317
2G2 51318
2H2 51319
GNHNC
2B1 51320
MGOJAM
2A3 51321
2B3 51322
2F3 51323
2G3 51324
2C3 51325
2D3 51326
2E3 51327
2L4 51328
2M4 51329
2N4 51330
2L2 51331
2M2 51332
GOJAM
+3VDC A POWER IN
+3 V DC TO GATES
OVDC
C1
C2
C3
C4

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
4. ⊖ ← DENOTES AGC 4 PIN NO. ← DENOTES AGC 5 PIN NO.
5. 2M5 51090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2	1006755-79	↓	6.8UF
C3	1006755-79	↓	6.8UF
C4	1006755-79	↓	6.8UF

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN J.F. Welch DATE 7/12/63
CHECKED
APPROVAL W.B. Tuesen 7/30/63
APPROVAL Albert Hopkins 7-30
NASA APPROVAL W.J. Rhine 7-31-63
MIT APPROVAL [illegible] Hazel 7/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'N'
LOGIC MODULE NO. A28

CODE IDENT NO. SIZE E NASA DRAWING NO. 1006552
SCALE — WT — SHEET 1 OF 1

1006552

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

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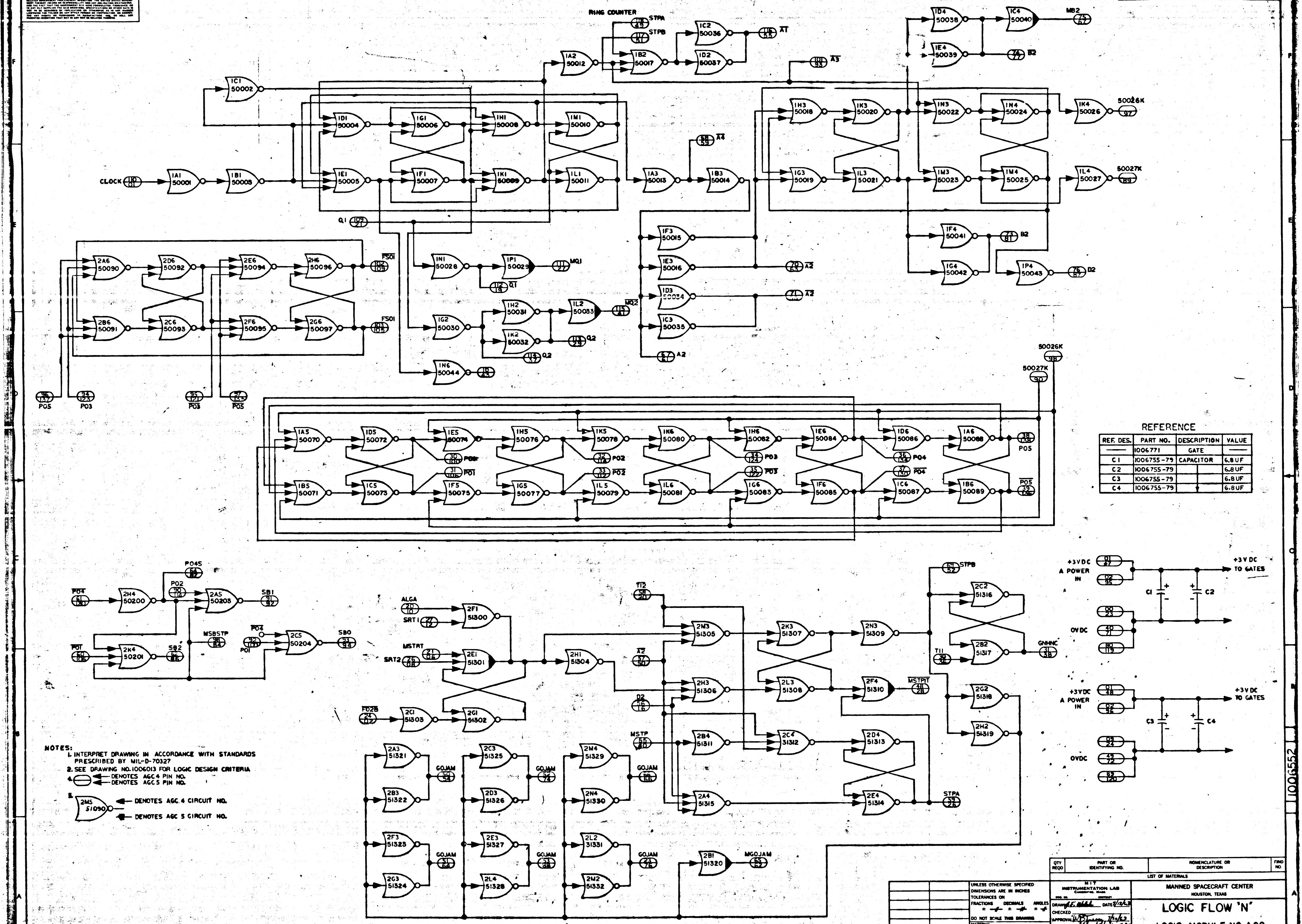
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL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CLOCK
STPA
STPB
AT
A3
A4
A2
MB2
B2
D2
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MQ1
MQ2
Q2
FS01
P05
P03
P04
P01
P02
50026K
50027K
1A1 50001
1B1 50003
1C1 50002
1D1 50004
1E1 50005
1G1 50006
1F1 50007
1H1 50008
1K1 50009
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1B6 50089
P04S
SB1
SB2
SB0
MSBSTP
2H4 50200
2A5 50203
2K4 50201
2C5 50204
ALGA
SAT1
MSTRT
SAT2
F02B
2F1 51300
2E1 51301
2G1 51302
2C1 51303
2H1 51304
T12
T11
MSTP
2M3 51305
2H3 51306
2K3 51307
2L3 51308
2N3 51309
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2B4 51311
2C4 51312
2D4 51313
2E4 51314
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GNHNC
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2C3 51325
2D3 51326
2E3 51327
2L4 51328
2M4 51329
2N4 51330
2L2 51331
2M2 51332
2B1 51320
GOJAM
MGOJAM
+3VDC A POWER IN
+3V DC TO GATES
0VDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
4. ◄— DENOTES AGC4 PIN NO.
   ◄— DENOTES AGC5 PIN NO.
5. 2M5 51090 ◄— DENOTES AGC 4 CIRCUIT NO.
   ◄— DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.F. Webb DATE 7/12/63
CHECKED
APPROVAL W.B. Timson 7/30/63
APPROVAL Albert Hopkins 7.30
NASA APPROVAL W.Q. Williams 7-31-63
MIT APPROVAL R Haefel 7/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'N'
LOGIC MODULE NO. A28

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006552
SCALE — | WT — | SHEET 1 OF 1

1006552

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

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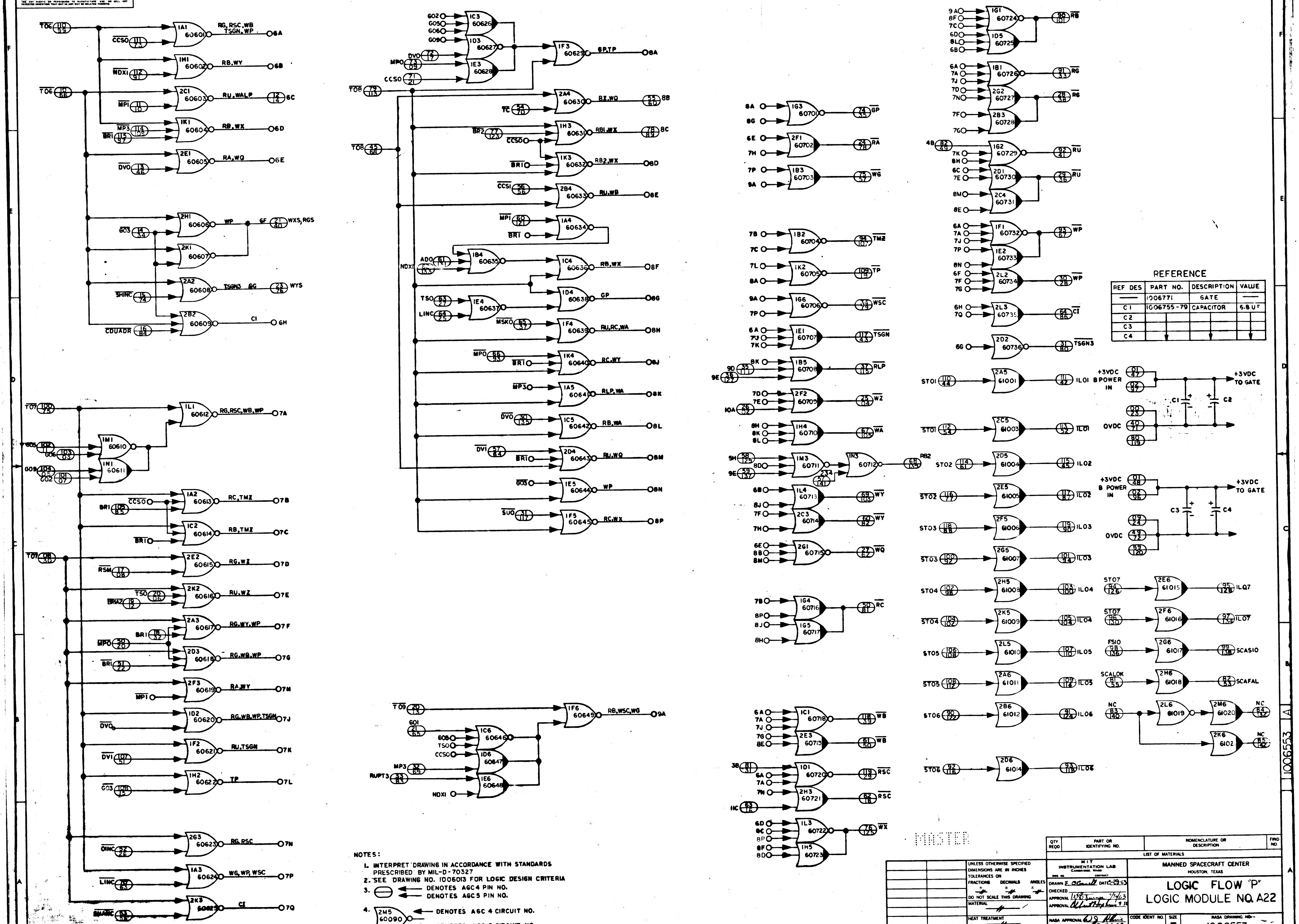
REVISIONS TDRR 02282			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03604	10-3-63	WC

CONTROL PULSE 2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C
B
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T06
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NDXI
MPI
MP3
BRI
DVO
G03
SHINC
CDUADR
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1M1 60602 RB,WY 6B
2C1 60603 RU,WALP 6C
1K1 60604 RB,WX 6D
2E1 60605 RA,WQ 6E
2H1 60606 WP 6F WXS,RGS
2K1 60607
2A2 60608 TSGN3 6G WYS
2B2 60609 CI 6H
G02
G05
G06
G09
MPO
1C3 60626
1D3 60627
1E3 60628
1F3 60629 GP,TP 8A
T08
TC
BR2
CCSI
2A4 60630 RZ,WQ 8B
1H3 60631 RB1,WX 8C
1K3 60632 RB2,WX 8D
2B4 60633 RU,WB 8E
1A4 60634
ADO
1B4 60635
1C4 60636 RB,WX 8F
TSO
LINC
1E4 60637
1D4 60638 GP 8G
MSKO
1F4 60639 RU,RC,WA 8H
1K4 60640 RC,WY 8J
1A5 60641 RLP,WA 8K
1C5 60642 RB,WA 8L
DVI
2D4 60643 RU,WQ 8M
1E5 60644 WP 8N
SUO
1F5 60645 RC,WX 8P
T09
G01
RUPT3
1F6 60649 RB,WSC,WG 9A
1C6 60646
1D6 60647
1E6 60648
T07
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1M1 60610
1N1 60611
1A2 60613 RC,TMZ 7B
1C2 60614 RB,TMZ 7C
RSM
2E2 60615 RG,WZ 7D
BRXZ
2K2 60616 RU,WZ 7E
2A3 60617 RG,WY,WP 7F
2D3 60618 RG,WB,WP 7G
2F3 60619 RA,WY 7H
1D2 60620 RG,WB,WP,TSGN 7J
1F2 60621 RU,TSGN 7K
1H2 60622 TP 7L
DINC
2G3 60623 RG,RSC 7N
1A3 60624 WG,WP,WSC 7P
2K3 60625 CI 7Q
1G3 60701 GP
2F1 60702 RA
1B3 60703 WG
1B2 60704 TMZ
1K2 60705 TP
1G6 60706 WSC
1E1 60707 TSGN
1B5 60708 RLP
2F2 60709 WZ
1H4 60710 WA
1M3 60711
1N3 60712 RB2
1L4 60713 WY
2C3 60714 WY
2G1 60715 WQ
1G4 60716 RC
1G5 60717
1C1 60718 WB
2E3 60719 WB
1D1 60720 RSC
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1L3 60722 WX
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2G2 60727 RG
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1G2 60729 RU
2D1 60730 RU
2C4 60731
1F1 60732 WP
1E2 60733
2L2 60734 WP
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ST02
ST03
ST04
ST05
ST06
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2C5 61003 IL01
2D5 61004 IL02
2E5 61005 IL02
2F5 61006 IL03
2G5 61007 IL03
2H5 61008 IL04
2K5 61009 IL04
2L5 61010 IL05
2A6 61011 IL05
2B6 61012 IL06
2D6 61014 IL06
+3VDC B POWER IN
+3VDC TO GATE
OVDC
C1
C2
C3
C4
ST07
2E6 61015 ILO7
2F6 61016 ILO7
FSIO
2G6 61017 SCASIO
SCALOK
2H6 61018 SCAFAL
NC
2L6 61019
2M6 61020 NC
2K6 6102 NC

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 60090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

REFERENCE

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN E. O'Connell DATE 5-29-63
CHECKED
APPROVAL WB Turner 7/3/63
APPROVAL Albert Hopkins 9 18
NASA APPROVAL W. J. Rhine 7-31-63
MIT APPROVAL D Hafd 7/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "P"
LOGIC MODULE NO. A22

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006553
SCALE —
WT
SHEET 1 OF 1

1006553 A

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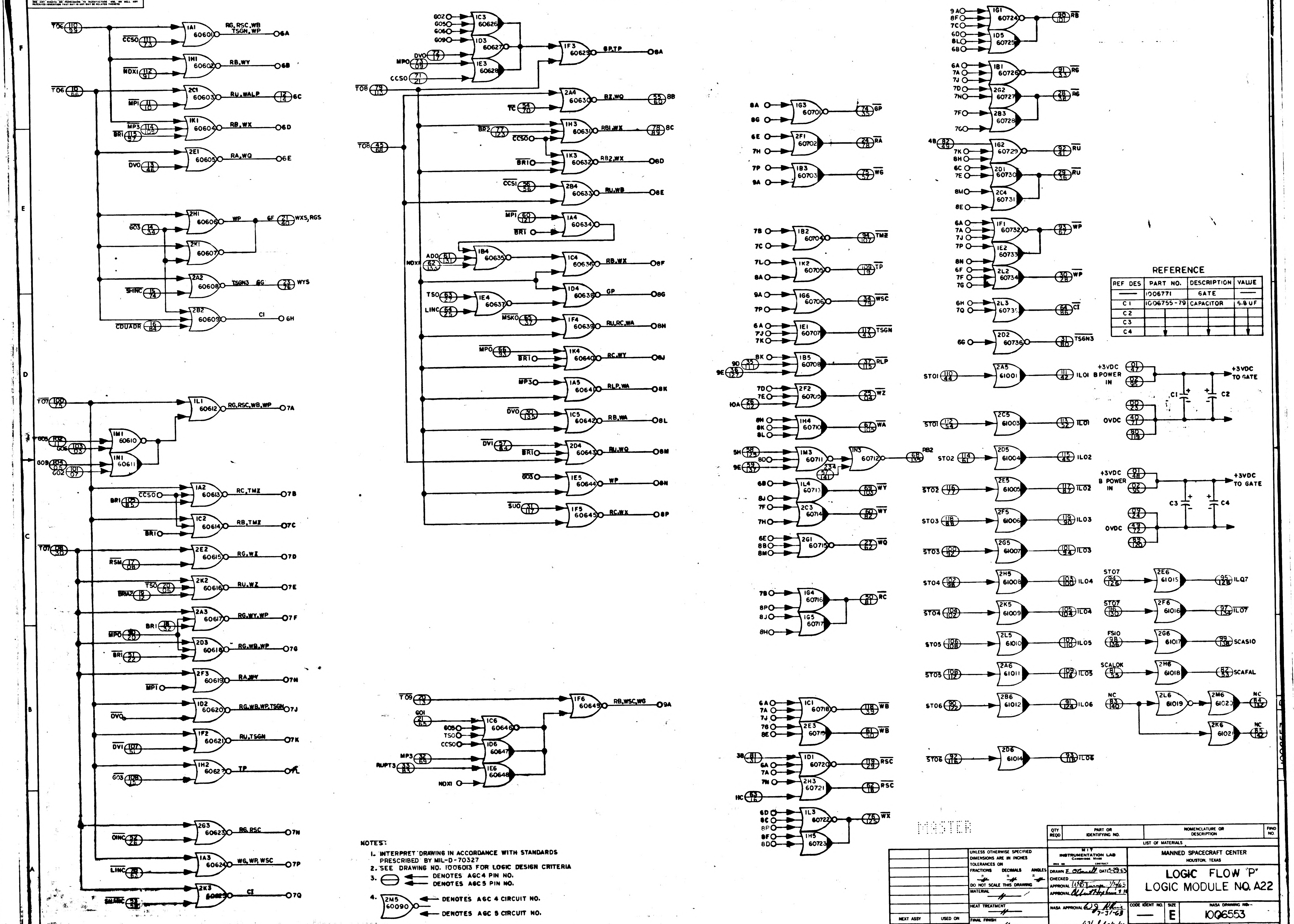
REVISIONS TDRR 02282			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRA 03604	11-3-63	WF
B	REVISED PER TDRR 04501	11-6-63	DL

CONTROL PULSE 2



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D
C
B
A
T06 110/99
CCSO 111/73
NDXI 112/91
T06 10/66
MPI 11/10
MP3 114/123
BRI 115/97
DVO 13/46
G03 14/34
SHINC 15/74
CDUADR 16/84
1A1 60601 RG,RSC,WB, TSGN,WP 6A
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2K1 60607
2A2 60608 TSGN3 6G 23/76 WYS
2B2 60609 CI 6H
T07 100/75
G05 102/11
G06 103/03
G09 104/05
G02 101/07
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1C2 60614 RB,TMZ 7C
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RSM 17/08
BRXAZ 19/12
TS0 20/65
MPO 30/20
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BRI 31/22
DVO
DVI 107/51
G03 108/15
OINC 32/26
LINC 28/63
SHANC 33/37
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2F3 60619 RA,WY 7H
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DVO 72/17
MPO 74/09
CCSO 71/21
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T08 73/113
T08 43/68
TC 54/70
BR2 77/123
CCSO
BRI
CCSI 56/56
MPI 60/121
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ADO 61/131
NDXI 62/133
TSO 63/27
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MSKO 65/37
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BRI
MP3
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BRI
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RUPT3 33/83
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1E6 60648
8A 8G
1G3 60701 74/33 GP
6E 7H
2F1 60702 24/78 RA
7P 9A
1B3 60703 75/57 WG
7B 7C
1B2 60704 94/107 TMZ
7L 8A
1K2 60705 103/19 TP
9A 7P
1G6 60706 34/79 WSC
6A 7J 7K
1E1 60707 117/45 TSGN
8K 9D 35/111 9E 36/127
1B5 60708 37/115 RLP
7D 7E 10A 26/02
2F2 60709 25/04 WZ
8H 8K 8L
1H4 60710 67/105 WA
5H 58/129 8D 9E 59/137
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1N3 60712 68/139 RB2
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1L4 60713 69/103 WY
2C3 60714 60/82 WY
6E 8B 8M
2G1 60715 27/62 WQ
7B 8P 8J 8H
1G4 60716 50/81 RC
1G5 60717
6A 7A 7J 7G 8E
1C1 60718 118/39 WB
2E3 60719 61/50 WB
3B 81/31 6A 7A
1D1 60720 119/29 RSC
2H3 60721 62/18 RSC
HC 63/16
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1H5 60723
9A 8F 7C 6D 8L 6B
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1D5 60725
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2C4 60731
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1F1 60732 93/67 WP
1E2 60733
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6H 7Q
2L3 60735 64/86 CI
6G
2D2 60736 31/80 TSGN3
ST01 110/44
2A5 61001 111/42 IL01
ST01 112/54
2C5 61003 113/52 IL01
ST02 114/61
2D5 61004 115/45 IL02
ST02 116/77
2E5 61005 117/87 IL02
ST03 118/88
2F5 61006 119/90 IL03
ST03 100/92
2G5 61007 101/94 IL03
ST04 102/98
2H5 61008 103/100 IL04
ST04 104/102
2K5 61009 105/104 IL04
ST05 106/108
2L5 61010 107/110 IL05
ST05 108/112
2A6 61011 109/114 IL05
ST06 90/122
2B6 61012 91/124 IL06
ST06 92/116
2D6 61014 93/118 IL06
ST07 94/126
2E6 61015 95/128 ILO7
ST07 96/130
2F6 61016 97/132 IL07
FSIO 98/136
2G6 61017 99/138 SCASIO
SCALOK 81/35
2H6 61018 82/33 SCAFAL
NC 83/140
2L6 61019
2M6 61020 NC 84/132
2K6 61021 NC 85/142
+3VDC B POWER IN 01/47 02/95
+3VDC TO GATE
C1 C2
OVDC 00/23 40/71 80/119
+3VDC B POWER IN 01/48 02/35
+3VDC TO GATE
C3 C4
OVDC 00/24 49/72 89/120

REFERENCE

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
4. 2M5 60090 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO — CONTRACT
DRAWN E O'Connell DATE 5-29-63
CHECKED
APPROVAL WB Turnage 7/30/63
APPROVAL Albert Hopkins 7/30
NASA APPROVAL W J Rhine 7-31-63
MIT APPROVAL D Hoag 7/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "P"
LOGIC MODULE NO. A22

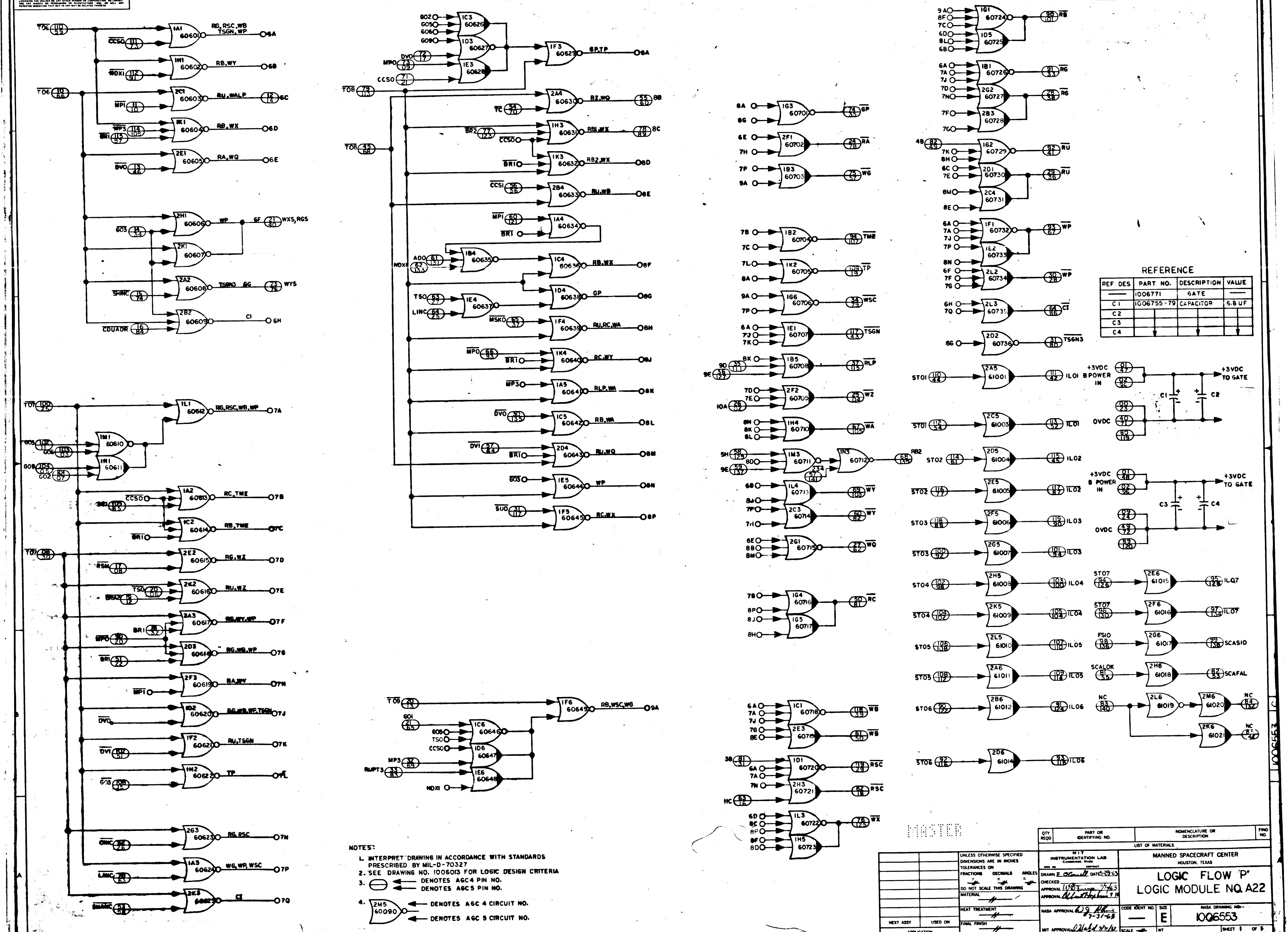
CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006553
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS TDRR 02282

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03604	10-3-63	WK
B	REVISED PER TDRR 04501	11-6-63	[illegible] WK
C	REVISED PER TDRR 04750	1-17-63	[illegible]

CONTROL PULSE 2



T06 1A1 60601 RG, RSC, WB TSGN, WP 6A
CCSO 1M1 60602 RB, WY 6B
NDXI 2C1 60603 RU, WALP 6C
MP1 1K1 60604 RB, WX 6D
MP3 BR1 2E1 60605 RA, WQ 6E
DV0
2H1 60606 WP 6F WXS, RGS
603 2K1 60607
2A2 60608 TSGN3 6G WYS
SHINC 2B2 60609 CI 6H
CDUADR
802 605 606 609 1C3 60626
1D3 60627
DV0 MP0 1E3 60628
CCS0 1F3 60629 GP, TP 8A
T08 2A4 60630 RZ, WQ 8B
TC 1H3 60631 RB1, WX 8C
BR2 CCS0 1K3 60632 RB2, WX 8D
BR1
CCS1 2B4 60633 RU, WB 8E
MP1 BR1 1A4 60634
ADD NDXI 1B4 60635
1C4 60636 RB, WX 8F
1D4 60638 GP 8G
TS0 LINC 1E4 60637
MSK0 1F4 60639 RU, RC, WA 8H
MP0 BR1 1K4 60640 RC, WY 8J
MP3 1A5 60641 RLP, WA 8K
DV0 1C5 60642 RB, WA 8L
DV1 BR1 2D4 60643 RU, WQ 8M
603 1E5 60644 WP 8N
SU0 1F5 60645 RC, WX 8P
T07 1L1 60612 RG, RSC, WB, WP 7A
605 606 1M1 60610
609 602 1N1 60611
CCS0 1A2 60613 RC, TMZ 7B
BR1 1C2 60614 RB, TMZ 7C
2E2 60615 RG, WZ 7D
RSM 2K2 60616 RU, WZ 7E
TS0 BRA2 2A3 60617 RG, WY, WP 7F
BR1 MP0 2D3 60618 RG, WB, WP 7G
BR1 2F3 60619 RA, WY 7H
MP1 1D2 60620 RG, WB, WP, TSGN 7J
DV0 1F2 60621 RU, TSGN 7K
DV1 1H2 60622 TP 7L
603
2G3 60623 RG, RSC 7N
CINC 1A3 60624 WG, WP, WSC 7P
LINC 2K3 60625 CI 7Q
SHANC
T09 1F6 60649 RB, WSC, WG 9A
601 608 TS0 1C6 60646
CCS0 1D6 60647
MP3 RUPT3 1E6 60648
NDXI
1G3 60701 GP 8A 8G
2F1 60702 RA 6E 7H
1B3 60703 WG 7P 9A
1B2 60704 TMZ 7B 7C
1K2 60705 TP 7L 8A
1G6 60706 WSC 9A 7P
1E1 60707 TSGN 6A 7J 7K
1B5 60708 RLP 8K 9D 9E
2F2 60709 WZ 7D 7E 10A
1H4 60710 WA 8H 8K 8L
1M3 60711 5H 8D 9E
1N3 60712 RB2
1L4 60713 WY 6B 8J
2C3 60714 WY 7P 7H
2G1 60715 WQ 6E 8B 8M
1G4 60716 RC 7B 8P
1G5 60717 8J 8H
1C1 60718 WB 6A 7A 7J
2E3 60719 WB 7G 8E
1D1 60720 RSC 3B 6A 7A
2H3 60721 RSC 7N HC
1L3 60722 WX 6D 8C 8P
1H5 60723 8F 8D
1G1 60724 RB 9A 8F 7C
1D5 60725 6D 8L 6B
1B1 60726 RG 6A 7A 7J
2G2 60727 RG 7D 7N
2B3 60728 7F 7G
1G2 60729 RU 4B 7K 8H
2D1 60730 RU 6C 7E
2C4 60731 8M 8E
1F1 60732 WP 6A 7A 7J 7P
1E2 60733 8N
2L2 60734 WP 6F 7F 7G
2L3 60735 CI 6H 7Q
2D2 60736 TSGN3 6G
ST01 2A5 61001 IL01
+3VDC B POWER IN +3VDC TO GATE C1 C2 0VDC
ST01 2C5 61003 IL01
ST02 2D5 61004 IL02
ST02 2E5 61005 IL02
+3VDC B POWER IN +3VDC TO GATE C3 C4 0VDC
ST03 2F5 61006 IL03
ST03 2G5 61007 IL03
ST04 2H5 61008 IL04
ST04 2K5 61009 IL04
ST05 2L5 61010 IL05
ST05 2A6 61011 IL05
ST06 2B6 61012 IL06
ST06 2D6 61014 IL06
ST07 2E6 61015 ILQ7
ST07 2F6 61016 IL07
FSIO 2G6 61017 SCASIO
SCALOK 2H6 61018 SCAFAL
NC 2L6 61019 2M6 61020 NC
2K6 61021 NC
MASTER

REFERENCE

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 60090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN E. O'Connell DATE 5-29-63
CHECKED
APPROVAL W.D. Turner 7/3/63
APPROVAL Albert Hopkins 7/1
NASA APPROVAL W. J. Rhine 7-31-63
MIT APPROVAL D. Hoag 7/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "P"
LOGIC MODULE NO. A22

CODE IDENT NO. — SIZE E NASA DRAWING NO. 1006553
SCALE — WT SHEET 1 OF 1

INCHES
PHOTOGRAPHIC SCALE ONLY

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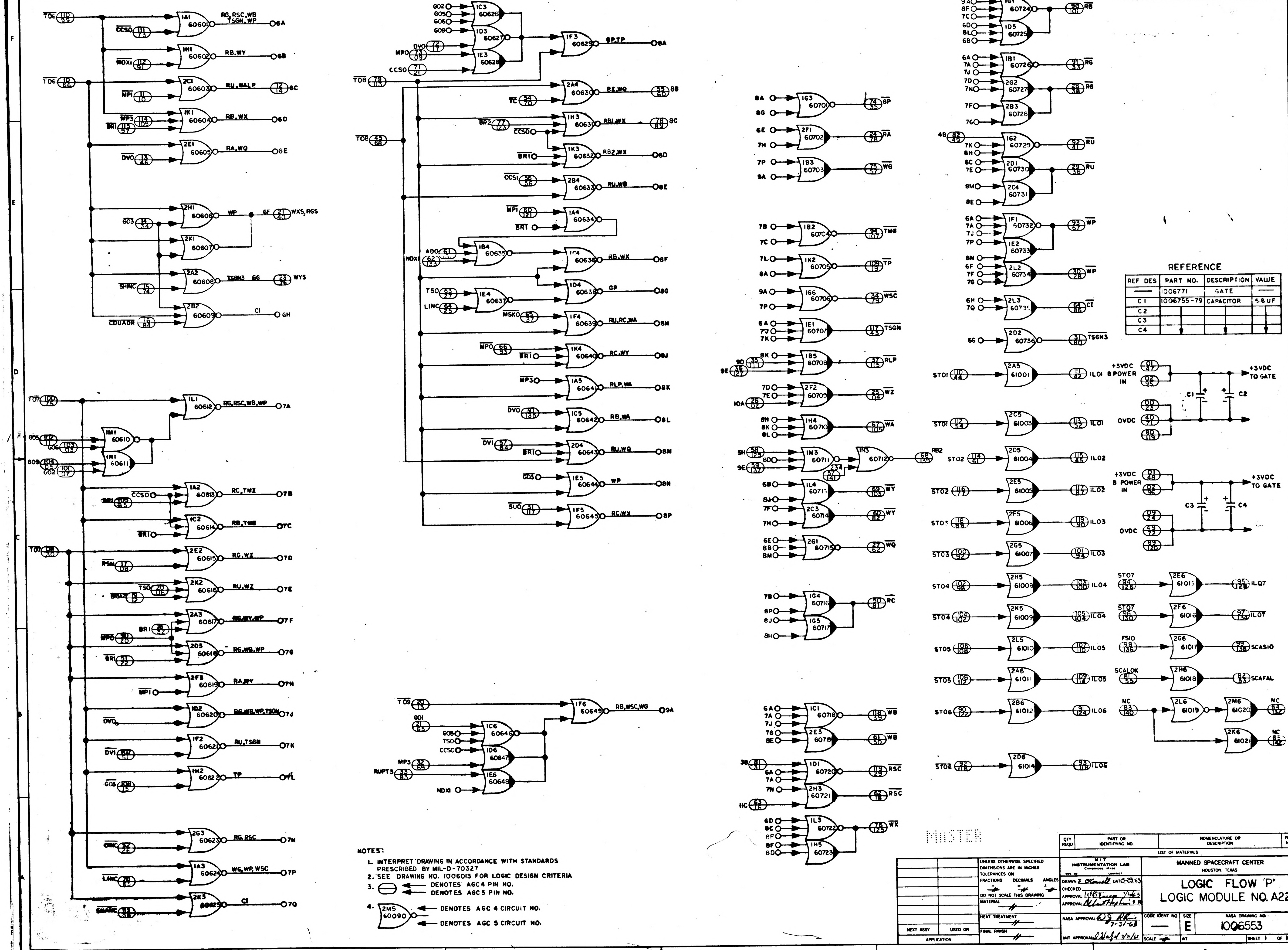
CONTROL PULSE 2

REVISIONS TDRR 02282

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRA 03604	10-3-63	WK
B	REVISED PER TDRR 04501	11-6-63	WK
C	REVISED PER TDRR 04752	1-19-63	
D	REVISED PER TDRR 05047	9 DEC 63	12/63


T06 · 1A1 60601 · RG, RSC, WB, TSGN, WP · 6A
CCSO · 1H1 60602 · RB, WY · 6B
T06 · 2C1 60603 · RU, WALP · 6C
MP1 · 1K1 60604 · RB, WX · 6D
MP3 · BR1
2E1 60605 · RA, WQ · 6E · DV0
2H1 60606 · WP · 6F · WXS, RGS
G03 · 2K1 60607
2A2 60608 · TSGN3 6G · WYS · SHINC
2B2 60609 · CI · 6H · CDUADR
T07 · 1L1 60612 · RG, RSC, WB, WP · 7A
G05 · G06 · G09 · G02 · 1M1 60610 · 1N1 60611
1A2 60613 · RC, TMZ · 7B · CCSO
1C2 60614 · RB, TMZ · 7C · BR1
T07 · 2E2 60615 · RG, WZ · 7D · RSM
2K2 60616 · RU, WZ · 7E · TS0 · BRX2
2A3 60617 · RG, WY, WP · 7F · BR1
2D3 60618 · RG, WB, WP · 7G
2F3 60619 · RA, WY · 7H · MP1
1D2 60620 · RG, WB, WP, TSGN · 7J · DV0
1F2 60621 · RU, TSGN · 7K · DV1
1H2 60622 · TP · 7L · G03
2G3 60623 · RG, RSC · 7N · GINC
1A3 60624 · WG, WP, WSC · 7P · LINC
2K3 60625 · CI · 7Q · SHANC
G02 · G05 · G06 · G09 · 1C3 60625 · 1D3 60627 · 1E3 60628 · DV0 · MP0 · CCSO
1F3 60629 · GP, TP · 8A
T08 · 2A4 60630 · RZ, WQ · 8B · TC
1H3 60631 · RB1, WX · 8C · BR2 · CCS0
1K3 60632 · RB2, WX · 8D · BR1
2B4 60633 · RU, WB · 8E · CCS1
1A4 60634 · MP1 · BR1
ADO · NDXI · 1B4 60635
1C4 60636 · RB, WX · 8F
TS0 · LINC · 1E4 60637
1D4 60638 · GP · 8G
1F4 60639 · RU, RC, WA · 8H · MSK0
1K4 60640 · RC, WY · 8J · MP0 · BR1
1A5 60641 · RLP, WA · 8K · MP3
1C5 60642 · RB, WA · 8L · DV0
2D4 60643 · RU, WQ · 8M · DV1 · BR1
1E5 60644 · WP · 8N · G03
1F5 60645 · RC, WX · 8P · SU0
T09 · 1F6 60649 · RB, WSC, WG · 9A
G01 · G05 · TS0 · CCS0 · 1C6 60646 · 1D6 60647 · 1E6 60648 · MP3 · RUPT3 · NDXI
8A · 8G · 1G3 60701 · GP
6E · 7H · 2F1 60702 · RA
7P · 9A · 1B3 60703 · WG
7B · 7C · 1B2 60704 · TMZ
7L · 8A · 1K2 60705 · TP
9A · 7P · 1G6 60706 · WSC
6A · 7J · 7K · 1E1 60707 · TSGN
8K · 9D · 9E · 1B5 60708 · RLP
7D · 7E · 10A · 2F2 60709 · WZ
8N · 8K · 8L · 1H4 60710 · WA
5H · 8D · 9E · 1M3 60711 · 1N3 60712 · 6B · RB2
6B · 8J · 7F · 7H · 1L4 60713 · 2C3 60714 · WY
6E · 8B · 8M · 2G1 60715 · WQ
7B · 8P · 8J · 8H · 1G4 60716 · 1G5 60717 · RC
6A · 7A · 7J · 7G · 8E · 1C1 60718 · 2E3 60719 · WB
3B · 6A · 7A · 7N · 1D1 60720 · 2H3 60721 · RSC · HC
6D · 8C · 8P · 8F · 8D · 1L3 60722 · 1H5 60723 · WX
9A · 8F · 7C · 6D · 8L · 6B · 1G1 60724 · 1D5 60725 · RB
6A · 7A · 7J · 7D · 7N · 1B1 60726 · 2G2 60727 · RG
7F · 7G · 2B3 60728 · RG
4B · 7K · 8H · 6C · 7E · 8M · 8E · 1G2 60729 · 2D1 60730 · 2C4 60731 · RU
6A · 7A · 7J · 7P · 8N · 6F · 7F · 7G · 1F1 60732 · 1E2 60733 · 2L2 60734 · WP
6H · 7Q · 2L3 60735 · CI
6G · 2D2 60736 · TSGN3
ST01 · 2A5 61001 · IL01
+3VDC B POWER IN · +3VDC TO GATE · C1 · C2 · 0VDC
ST01 · 2C5 61003 · IL01
ST02 · 2D5 61004 · IL02
ST02 · 2E5 61005 · IL02
+3VDC B POWER IN · +3VDC TO GATE · C3 · C4 · 0VDC
ST03 · 2F5 61006 · IL03
ST03 · 2G5 61007 · IL03
ST04 · 2H5 61008 · IL04
ST04 · 2K5 61009 · IL04
ST05 · 2L5 61010 · IL05
ST05 · 2A6 61011 · IL05
ST06 · 2B6 61012 · IL06
ST06 · 2D6 61014 · IL06
ST07 · 2E6 61015 · ILQ7
ST07 · 2F6 61016 · IL07
FSIO · 2G6 61017 · SCASIO
SCALOK · 2H6 61018 · SCAFAL
NC · 2L6 61019 · 2M6 61020 · 2K6 61021 · NC
MASTER

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2			
C3			
C4			

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 60090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
Cambridge, Mass
DRAWN E. O'Connell DATE 5-29-63
CHECKED
APPROVAL [illegible] 7/3/63
APPROVAL Albert Hopkins
NASA APPROVAL W. J. Rhine 7-31-63
MIT APPROVAL D. Hoag 7/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'P'
LOGIC MODULE NO. A22

CODE IDENT NO. — SIZE E NASA DRAWING NO. 1006553
SCALE — WT SHEET 1 OF 1

1006553

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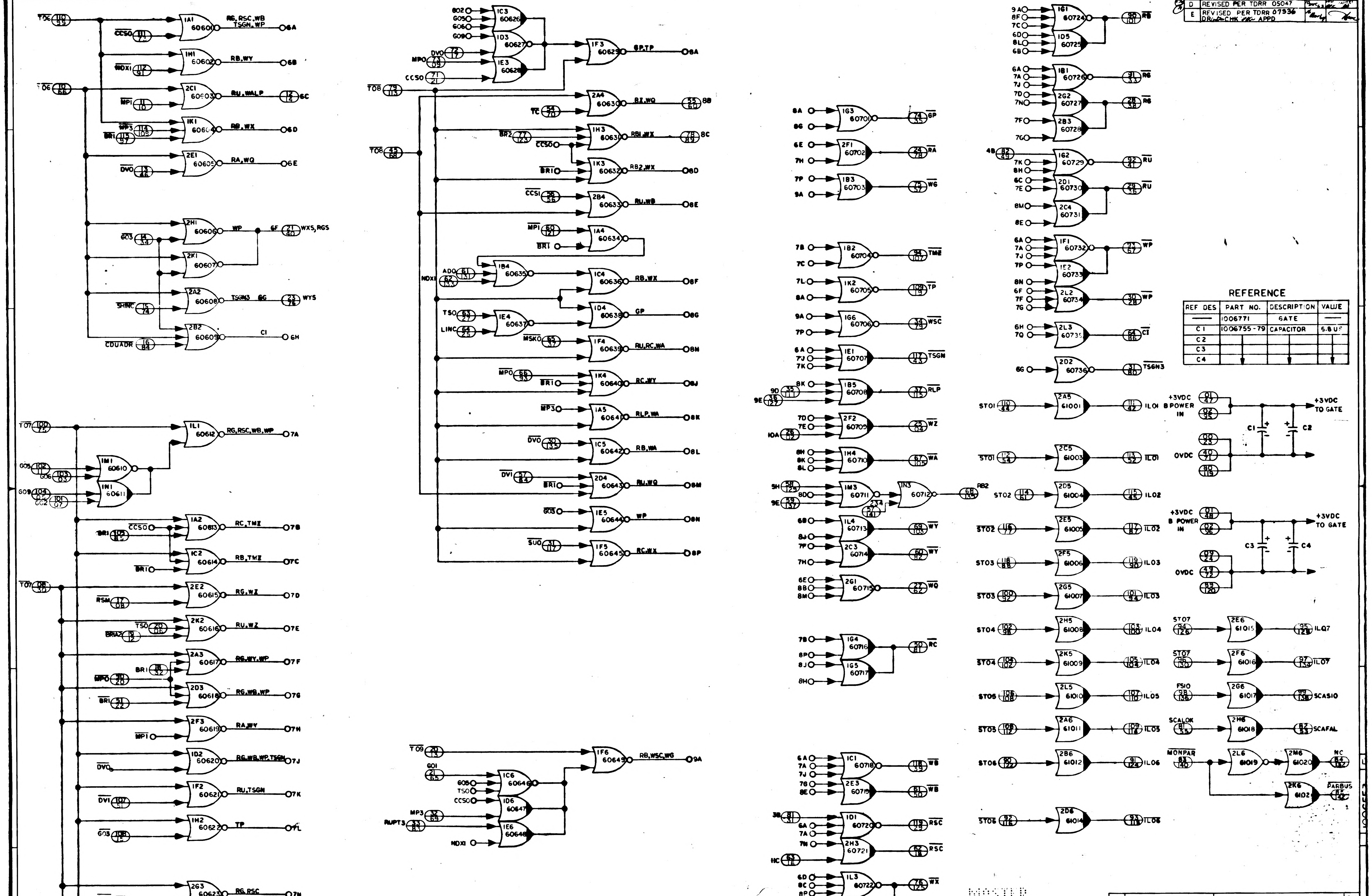
CONTROL PULSE 2

REVISIONS TDRR 02282

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03604	10-1-63	WR
B	REVISED PER TDRR 04501	11-6-63	CPL WR
C	REVISED PER TDRR 04751	11-19-63	
D	REVISED PER TDRR 05047	10 DEC 63	12/17/63
E	REVISED PER TDRR 07936 DR CHK APPD		



T06
CCSO
MDXI
MPI
MP3
BRI
DVO
G03
SHINC
CDUADR
1A1 60601 RG,RSC,WB TSGN,WP 6A
1H1 60602 RB,WY 6B
2C1 60603 RU,WALP 6C
1K1 60604 RB,WX 6D
2E1 60605 RA,WQ 6E
2H1 60606 WP 6F WXS,RGS
2K1 60607
2A2 60608 TSGN3 6G WYS
2B2 60609 CI 6H
T07
G05
G06
G09
1M1 60610
1N1 60611
1L1 60612 RG,RSC,WB,WP 7A
1A2 60613 RC,TMZ 7B
1C2 60614 RB,TMZ 7C
2E2 60615 RG,WZ 7D
RSM
2K2 60616 RU,WZ 7E
TSO
BRXZ
2A3 60617 RG,WY,WP 7F
2D3 60618 RG,WB,WP 7G
2F3 60619 RA,WY 7H
1D2 60620 RG,WB,WP,TSGN 7J
DVI
1F2 60621 RU,TSGN 7K
1H2 60622 TP 7L
2G3 60623 RG,RSC 7N
1A3 60624 WG,WP,WSC 7P
LINC
2K3 60625 CI 7Q
SHANC
B02 G05 G06 G09
1C3 60626
1D3 60627
1E3 60628
1F3 60629 GP,TP 8A
T08
2A4 60630 RZ,WQ 8B
TC
BR2
1H3 60631 RB1,WX 8C
1K3 60632 RB2,WX 8D
CCSI
2B4 60633 RU,WB 8E
1A4 60634
ADO
1B4 60635
1C4 60636 RB,WX 8F
1D4 60638 GP 8G
1E4 60637
LINC
MSKO
1F4 60639 RU,RC,WA 8H
1K4 60640 RC,WY 8J
1A5 60641 RLP,WA 8K
1C5 60642 RB,WA 8L
2D4 60643 RU,WQ 8M
1E5 60644 WP 8N
SUO
1F5 60645 RC,WX 8P
T09
G01
1C6 60646
1D6 60647
1E6 60648
RUPT3
1F6 60649 RB,WSC,WG 9A
1G3 60701 GP
2F1 60702 RA
1B3 60703 WG
1B2 60704 TMZ
1K2 60705 TP
1G6 60706 WSC
1E1 60707 TSGN
1B5 60708 RLP
2F2 60709 WZ
1H4 60710 WA
1M3 60711
1N3 60712 RB2
1L4 60713 WY
2C3 60714 WY
2G1 60715 WQ
1G4 60716 RC
1G5 60717
1C1 60718 WB
2E3 60719 WB
1D1 60720 RSC
2H3 60721 RSC
1L3 60722 WX
1M5 60723
1G1 60724 RG
1D5 60725
1B1 60726 RG
2G2 60727 RG
2B3 60728
1G2 60729 RU
2D1 60730 RU
2C4 60731
1F1 60732 WP
1E2 60733
2L2 60734 WP
2L3 60735 CI
2D2 60736 TSGN3
ST01 2A5 61001 IL01
ST01 2C5 61003 IL01
ST02 2D5 61004 IL02
ST02 2E5 61005 IL02
ST03 2F5 61006 IL03
ST03 2G5 61007 IL03
ST04 2H5 61008 IL04
ST04 2K5 61009 IL04
ST05 2L5 61010 IL05
ST05 2A6 61011 IL05
ST06 2B6 61012 IL06
ST06 2D6 61014 IL06
ST07 2E6 61015 ILQ7
ST07 2F6 61016 IL07
FS10 2G6 61017 SCASIO
SCALOK 2H6 61018 SCAFAL
MONPAR 2L6 61019
2M6 61020 NC
2K6 61021 PARBUS
+3VDC B POWER IN
+3VDC TO GATE
C1 C2 C3 C4
OVDC

REFERENCE

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	5.8 UF
C2			
C3			
C4			

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
4. 2M5 60090 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

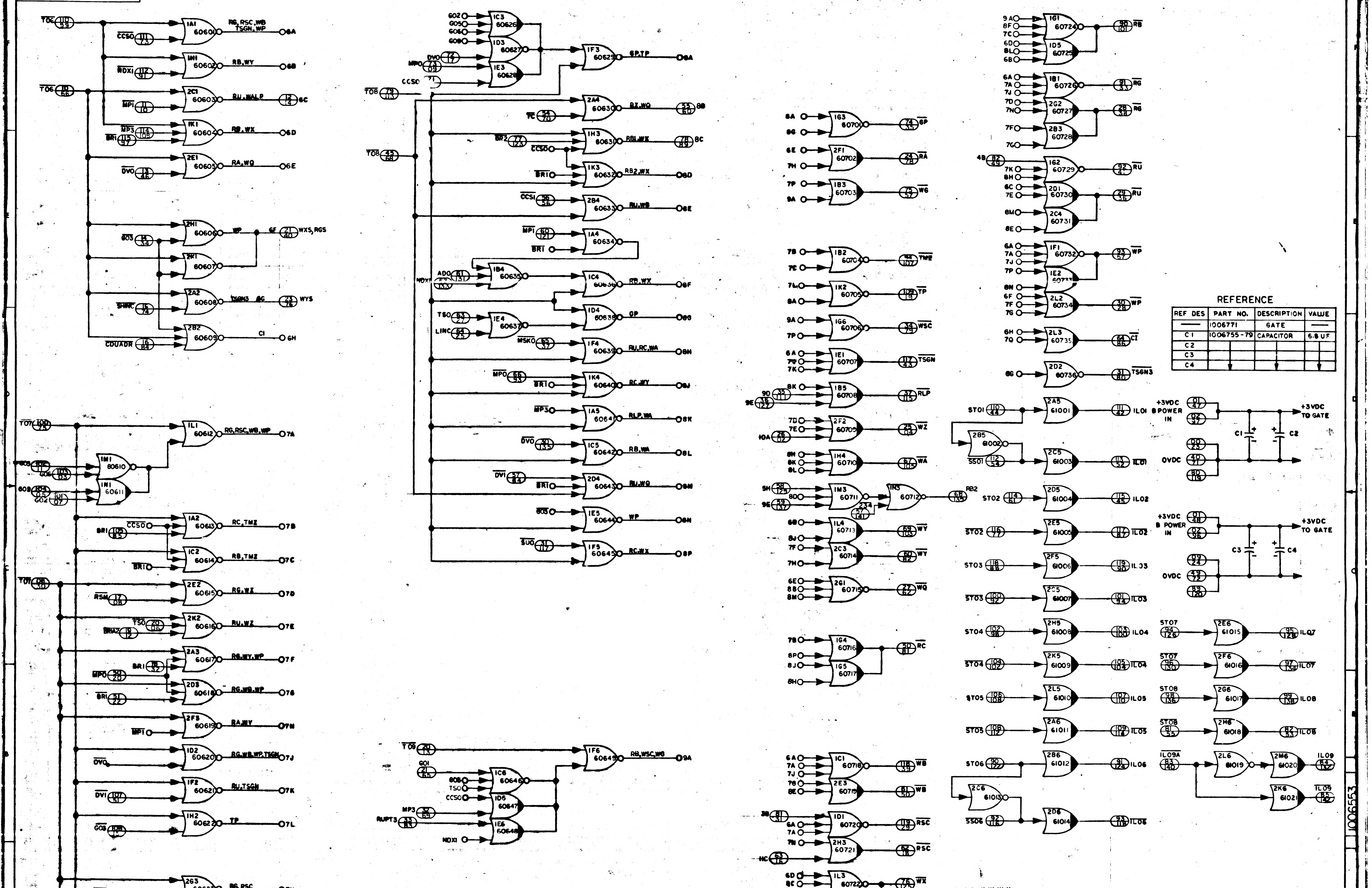
MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT
DRAWN E. O'Connell DATE 5-29-63
CHECKED
APPROVAL W.D. Turner 7/2/63
APPROVAL Albert Hopkins
NASA APPROVAL W. J. Rhine 7-31-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW 'P'
LOGIC MODULE NO. A22

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006553
SCALE —
WT
SHEET 1 OF 1

CONTROL PULSE 2



1A1 60601 RB, RSC, WB, TSGN, WP 6A
1M1 60602 RB, WY 6B
2C1 60603 RU, WALP 6C
1K1 60604 RB, WX 6D
2E1 60605 RA, WQ 6E
2H1 60606 WP WXS, RGS
2K1 60607
2A2 60608 TSGN3 WYS
2B2 60609 CI 6H
1L1 60612 RG, RSC, WB, WP 7A
1M1 60610
1N1 60611
1A2 60613 RC, TMZ 7B
1C2 60614 RB, TMZ 7C
2E2 60615 RG, WZ 7D
2K2 60616 RU, WZ 7E
2A3 60617 RB, WY, WP 7F
2D3 60618 RG, WB, WP 7G
2F3 60619 RA, WY 7H
1D2 60620 RG, WB, WP, TSGN 7J
1F2 60621 RU, TSGN 7K
1H2 60622 TP 7L
2G3 60623 RB, RSC 7N
1A3 60624 WG, WP, WSC 7P
2K3 60625 CI 7Q
1C3 60626
1D3 60627
1E3 60628
1F3 60629 GP, TP 8A
2A4 60630 RZ, WQ 8B
1H3 60631 RB1, WX 8C
1K3 60632 RB2, WX 8D
2B4 60633 RU, WB 8E
1A4 60634
1B4 60635
1C4 60636 RB, WX 8F
1D4 60638 GP 8G
1E4 60637
1F4 60639 RU, RC, WA 8H
1K4 60640 RC, WY 8J
1A5 60641 RLP, WA 8K
1C5 60642 RB, WA 8L
2D4 60643 RU, WQ 8M
1E5 60644 WP 8N
1F5 60645 RC, WX 8P
1F6 60649 RB, WSC, WG 9A
1C6 60646
1D5 60647
1E6 60648
CONTROL PULSE 2
1G3 60700 6P
2F1 60702 RA
1B3 60703 W6
1B2 60704 TMZ
1K2 60705 TP
1G6 60706 WSC
1E1 60707 TSGN
1B5 60708 RLP
2F2 60709 WZ
1H4 60710 WA
1M3 60711
1N3 60712 RB2
1L4 60713 WY
2C3 60714 WY
2G1 60715 WQ
1G4 60716 RC
1G5 60717
1C1 60718 WB
2E3 60719 WB
1D1 60720 RSC
2H3 60721 RSC
1L3 60722 WX
1H5 60723
1G1 60724 RB
1D5 60725
1B1 60726 RG
2G2 60727 RG
2B3 60728
1G2 60729 RU
2D1 60730 RU
2C4 60731
1F1 60732 WP
1E2 60733
2L2 60734 WP
2L3 60735 CI
2D2 60736 TSGN3
2A5 61001 IL01
2B5 61002
2C5 61003 IL01
2D5 61004 IL02
2E5 61005 IL02
2F5 61006 IL03
2C5 61007 IL03
2H5 61008 IL04
2K5 61009 IL04
2L5 61010 IL05
2A6 61011 IL05
2B6 61012 IL06
2C6 61013
2D6 61014 IL06
2E6 61015 IL07
2F6 61016 IL07
2G6 61017 IL08
2H6 61018 IL08
2L6 61019
2M6 61020 IL09
2K6 61021 IL09
+3VDC B POWER IN
+3VDC TO GATE
OVDC
C1 C2 C3 C4
MASTER

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 60090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

REFERENCE

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN E. O'Connell DATE 5-29-63
CHECKED
APPROVAL WB Turner 7/30/63
APPROVAL Albert Hopkins 7 31
NASA APPROVAL W J Rhine 7-31-63
MIT APPROVAL D Hoag 7/31/63

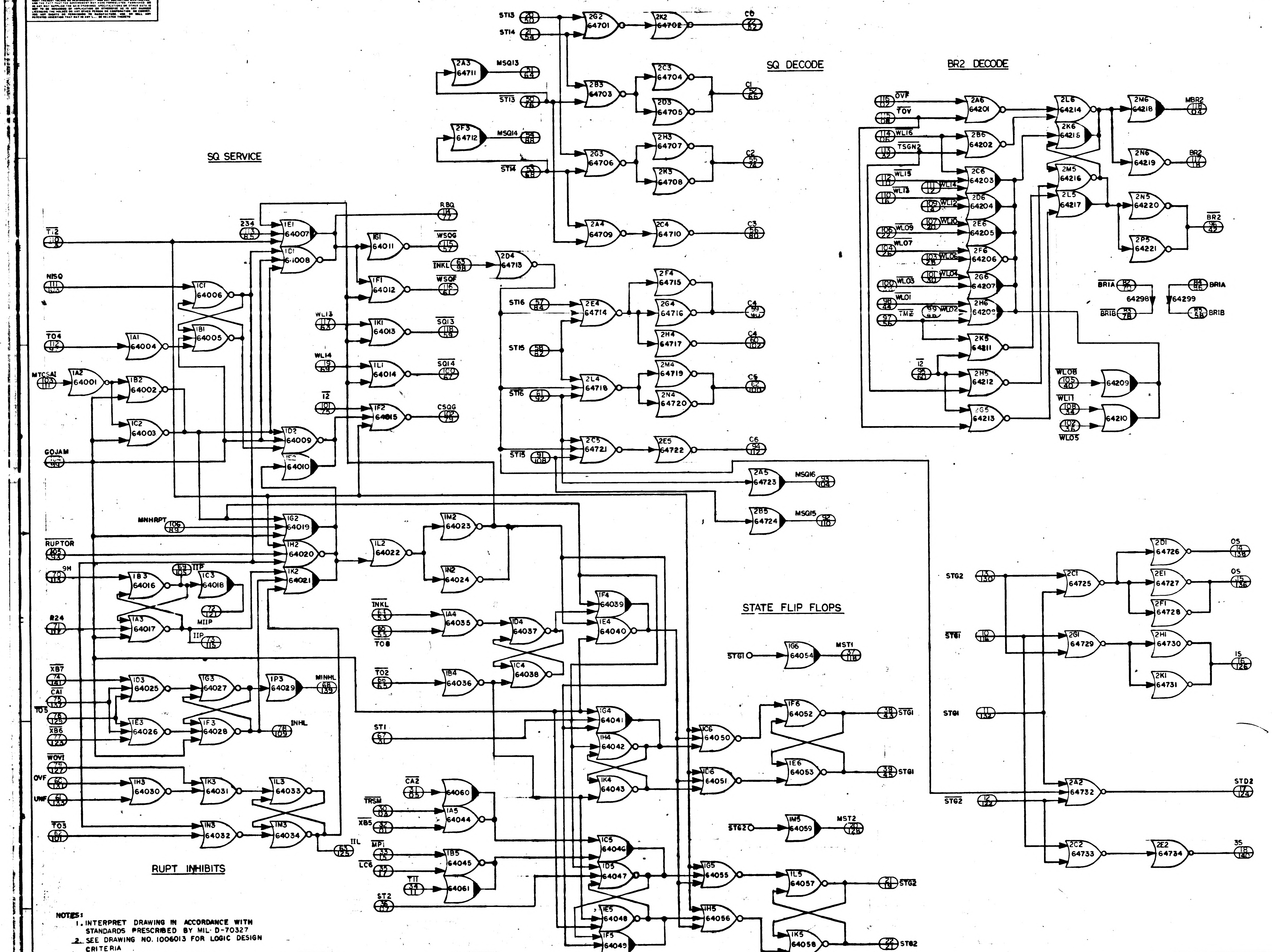
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "P"
LOGIC MODULE NO. A22

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006553
SCALE — WT SHEET 1 OF 1

1006553

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL


SQ SERVICE
SQ DECODE
BR2 DECODE
STATE FLIP FLOPS
RUPT INHIBITS
T12
NISQ
TO4
MTCSAI
GOJAM
MNHRPT
RUPTOR
9H
R24
XB7
CA1
TO5
XB6
WOVI
OVF
UNF
TO3
234
RBQ
WSQG
WSQF
SQ13
SQ14
CSQG
WL13
WL14
INKL
TO8
TO2
ST1
CA2
TRSM
XB5
MP1
LC6
T11
ST2
IIP
MIIP
MINHL
INHL
IIL
ST13
ST14
ST15
ST16
MSQ13
MSQ14
MSQ15
MSQ16
C0
C1
C2
C3
C4
C5
C6
OVF
TOV
WL16
TSGN2
WL15
WL12
WL11
WL10
WL09
WL08
WL07
WL06
WL05
WL04
WL03
WL02
WL01
TMZ
MBR2
BR2
BR1A
BR1B
STG1
STG2
MST1
MST2
STD2
O5
I5
35

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⬭ ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.
4. 2M5 --090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

+3VDC B POWER IN 01/47 02/95 → +3VDC TO GATES; C1, C2; OVDC 00/23 40/71 80/119

+3VDC B POWER IN 01/48 02/96 → +3VDC TO GATES; C3, C4; OVDC 09/24 49/72 89/120

REFERENCE

REF.DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2	↓	↓	↓
C3			
C4			

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN J.F. White DATE 5/29/63
CHECKED
APPROVAL W.B. Truman 13 AUG 63
APPROVAL Eldon C. Hall 13 Aug 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W.Kupfer 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW Q
LOGIC MODULE NO. 25

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006554
SCALE —
WT
SHEET 1 OF 1

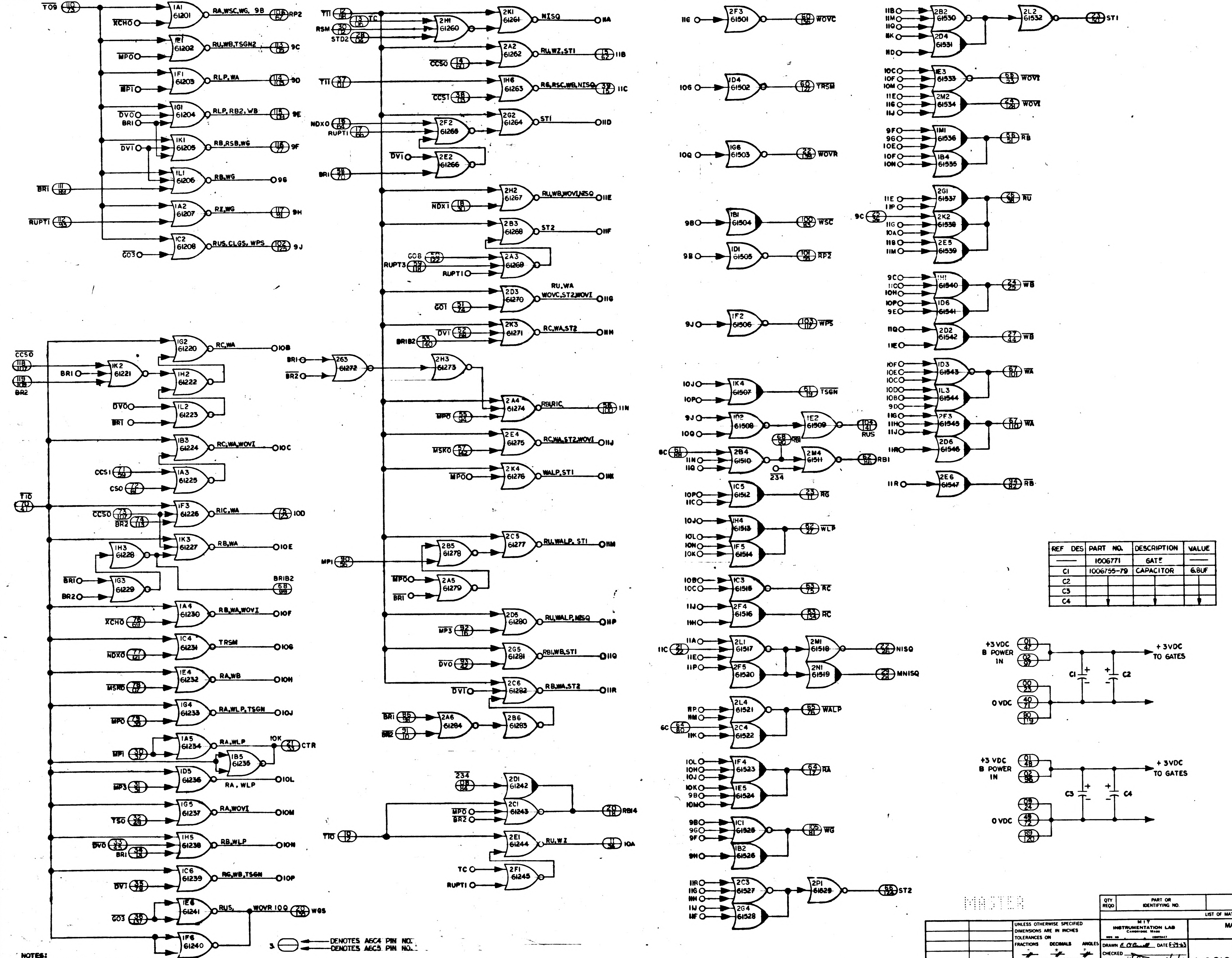
1006554

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS TDRR 02282			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02395	8/5/63	

CONTROL PULSE 3


TO9
XCHO
MPO
MPI
DVO
BRI
DVI
RUPTI
GO3
1A1 61201 RA,WSC,WG, 9B RP2
1E1 61202 RU,WB,TSGN2 9C
1F1 61203 RLP,WA 9D
1G1 61204 RLP,RB2,WB 9E
1K1 61205 RB,RSB,WG 9F
1L1 61206 RB,WG 9G
1A2 61207 RZ,WG 9H
1C2 61208 RUS,CLGS,WPS 9J
TII
RSM
STD2
TC
2H1 61260
2K1 61261 NISQ 11A
2A2 61262 RU,WZ,STI 11B
2H6 61263 RG,RSC,WB,NISQ 11C
2G2 61264 STI 11D
NDXO
2F2 61265
2E2 61266
2H2 61267 RU,WB,WOVI,NISQ 11E
NDXI
2B3 61268 ST2 11F
GO8
RUPT3
2A3 61269
2D3 61270 RU,WA WOVC,ST2,WOVI 11G
GO1
2K3 61271 RC,WA,ST2 11H
BRIB2
CCSO
BR2
1G2 61220 RC,WA 10B
1K2 61221
1H2 61222
1L2 61223
1B3 61224 RC,WA,WOVI 10C
CCSI
CSO
1A3 61225
TIO
1F3 61226 RIC,WA 10D
1K3 61227 RB,WA 10E
1H3 61228
1G3 61229
BRIB2
1A4 61230 RB,WA,WOVI 10F
1C4 61231 TRSM 10G
1E4 61232 RA,WB 10H
MSRO
1G4 61233 RA,WLP,TSGN 10J
1A5 61234 RA,WLP 10K CTR
1B5 61235
1D5 61236 10L RA,WLP
MP3
1G5 61237 RA,WOVI 10M
TSO
1H5 61238 RB,WLP 10N
1C6 61239 RG,WB,TSGN 10P
1E6 61241 RUS, WOVR 10Q WGS
1F6 61240
2G3 61272
2H3 61273
2A4 61274 RB1,RIC 11N
2E4 61275 RC,WA,ST2,WOVI 11J
MSKO
2K4 61276 WALP,STI 11K
2C5 61277 RU,WALP,STI 11M
2B5 61278
2A5 61279
2D5 61280 RU,WALP,NISQ 11P
2G5 61281 RB1,WB,STI 11Q
2C6 61282 RB,WA,ST2 11R
2A6 61284
2B6 61283
234
2D1 61242
2C1 61243 RB14
2E1 61244 RU,WZ 10A
2F1 61245
2F3 61501 WOVC
1D4 61502 TRSM
1G6 61503 WOVR
1B1 61504 WSC
1D1 61505 RP2
1F2 61506 WPS
1K4 61507 TSGN
1D2 61508
1E2 61509 RUS
2B4 61510
2M4 61511 RB1
1C5 61512 RG
1H4 61513 WLP
1F5 61514
1C3 61518 RC
2F4 61516 RC
2L1 61517
2M1 61518 NISQ
2F5 61520
2N1 61519 MNISQ
2L4 61521 WALP
2C4 61522
1F4 61523 RA
1E5 61524
1C1 61525 WG
1B2 61526
2C3 61527
2G4 61528
2P1 61529 ST2
2B2 61530
2D4 61531
2L2 61532 STI
1E3 61533 WOVI
2M2 61534 WOVI
1M1 61536 RB
1B4 61535
2G1 61537 RU
2K2 61538
2E5 61539
1H1 61540 WB
1D6 61541
2D2 61542 WB
1D3 61543 WA
1L3 61544
2E3 61545 WA
2D6 61546
2E6 61547 RB
+3 VDC B POWER IN
+ 3VDC TO GATES
C1
C2
0 VDC
C3
C4
3. DENOTES A6C4 PIN NO.
DENOTES A6C5 PIN NO.
4. 2M5 61090 DENOTES A6C4 CIRCUIT NO.
DENOTES A6C5 CIRCUIT NO.

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN E. O'Connell DATE 5-29-63
CHECKED
APPROVAL W.B. Truman 7/30/63
APPROVAL Albert Hopkins 7-31
NASA APPROVAL W. J. Rhine 7-31-63
MIT APPROVAL 7/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

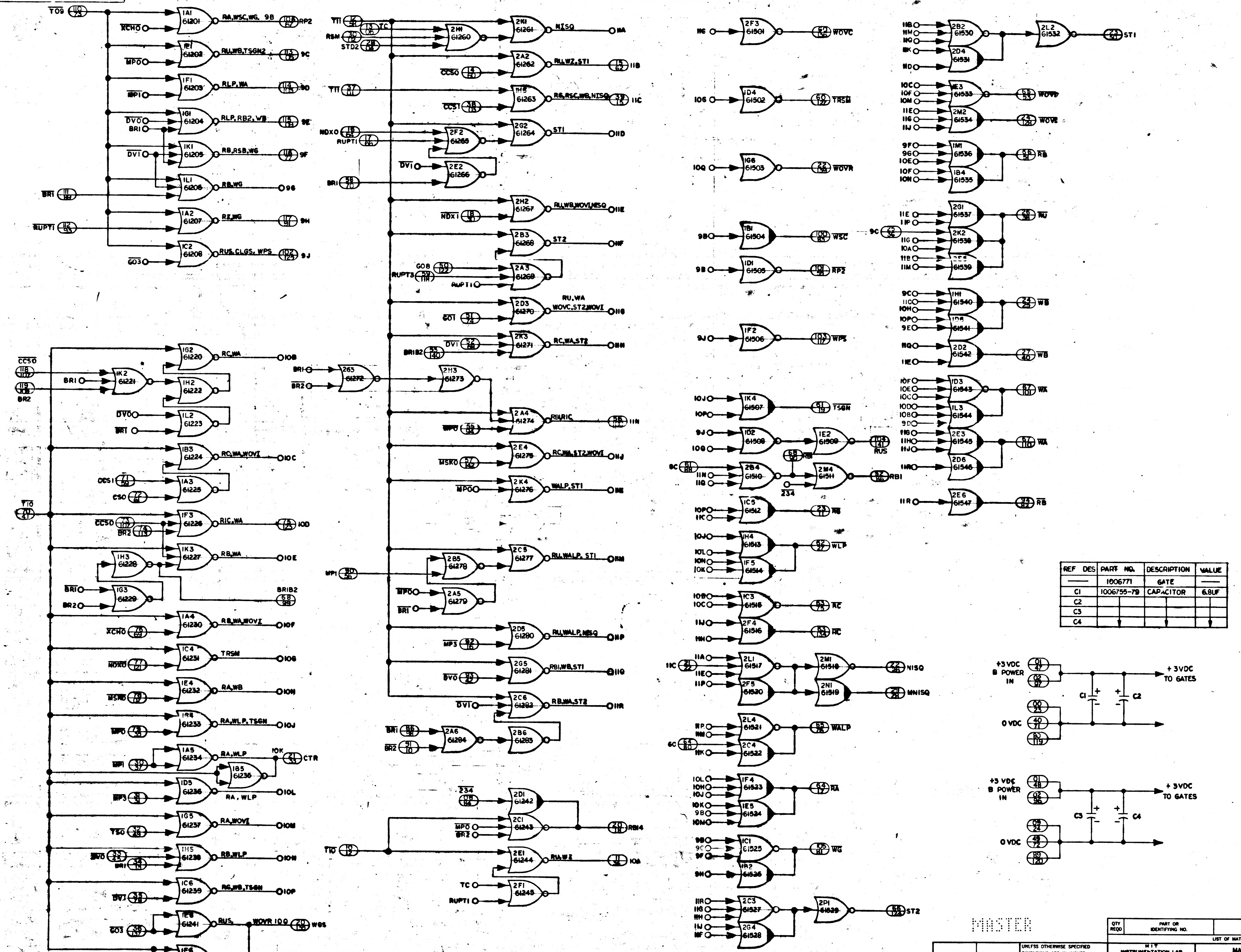
LOGIC FLOW "R"
LOGIC MODULE NO. A 24

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006555
SCALE —
WT —
SHEET 1 OF 1

1006555 A

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

CONTROL PULSE 3



REF DES	PART NO.	DESCRIPTION	VALUE
——	1006771	GATE	——
C1	1006755-79	CAPACITOR	6.8UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. DENOTES A6C4 PIN NO. / DENOTES A6C5 PIN NO.
4. DENOTES A6C4 CIRCUIT NO. / DENOTES A6C5 CIRCUIT NO.

A24

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN E. O'Connell DATE 5-29-63
CHECKED
APPROVAL WB Ternan 7/30/63
APPROVAL Albert Hopkins 7-31
NASA APPROVAL W J Rhine 7-31-63
MIT APPROVAL

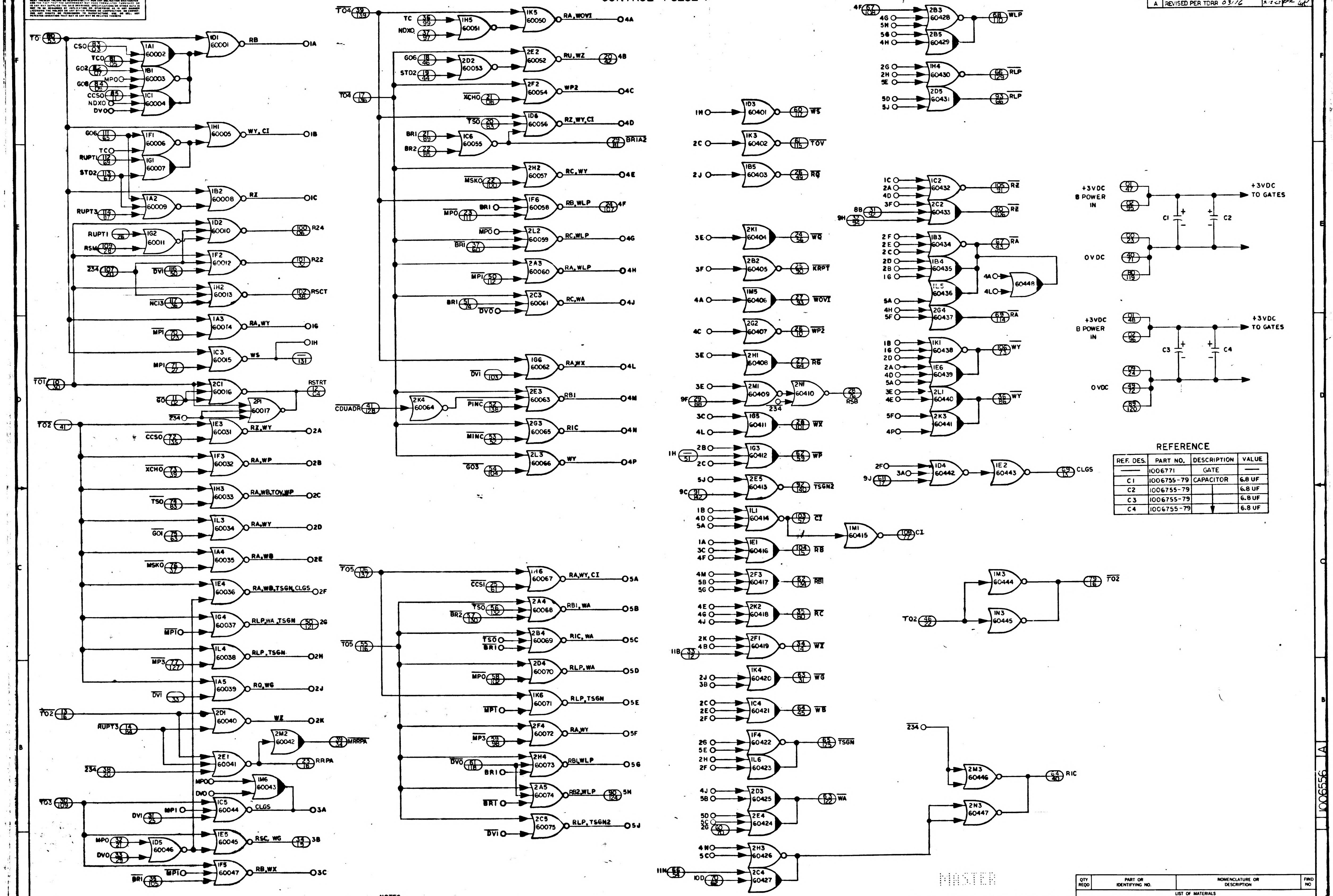
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "R"
LOGIC MODULE NO. A 24

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006555
SCALE — | WT — | SHEET 1 OF

REVISIONS TDRR 02049 7/17/63			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 0316	2-2-63	

CONTROL PULSE I



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TC0
G02
G06
MP0
CCS0
NDX0
DV0
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1B1 60003
1C1 60004
1D1 60001
RB
1A
1H1 60005
WY, CI
1B
1F1 60006
1G1 60007
RUPT1
STD2
1A2 60009
1B2 60008
RZ
1C
RUPT3
1D2 60010
R24
1G2 60011
RSM
1F2 60012
R22
234
DVI
1H2 60013
RSCT
NC13
1A3 60014
RA, WY
1G
MPI
1C3 60015
WS
1H
T01
2C1 60016
2P1 60017
RSTRT
G0
T02
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RZ, WY
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CCS0
1F3 60032
RA, WP
2B
XCH0
1H3 60033
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2C
TS0
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RA, WY
2D
G01
1A4 60035
RA, WB
2E
MSK0
1E4 60036
RA, WB, TSGN, CLGS
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RLP, WA, TSGN
2G
1L4 60038
RLP, TSGN
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MP3
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RQ, WG
2J
2D1 60040
WZ
2K
2M2 60042
MRRPA
2E1 60041
RRPA
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1C5 60044
CLGS
3A
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1E5 60045
RSC, WG
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1F5 60047
RB, WX
3C
BR1
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RG, WG, WY, RSB
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KRPT, RZ
3F
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TC
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1K5 60050
RA, WOVI
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RU, WZ
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WP2
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RZ, WY, CI
4D
1C6 60055
BRIA2
BR2
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RC, WY
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1F6 60058
RB, WLP
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RC, WLP
4G
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RA, WLP
4H
2C3 60061
RC, WA
4J
1G6 60062
RA, WX
4L
CDUADR
2K4 60064
PINC
2E3 60063
RBI
4M
MINC
2G3 60065
RIC
4N
G03
2L3 60066
WY
4P
T05
1H6 60067
RA, WY, CI
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CCSI
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RBI, WA
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RIC, WA
5C
2D4 60070
RLP, WA
5D
1K6 60071
RLP, TSGN
5E
2F4 60072
RA, WY
5F
2H4 60073
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2A5 60074
RB2, WLP
5H
2C5 60075
RLP, TSGN2
5J
1D3 60401
WS
1K3 60402
TOV
1B5 60403
RQ
2K1 60404
WQ
2B2 60405
KRPT
1M5 60406
WOVI
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WP2
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RG
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2N1 60410
RSB
1G5 60411
WX
1G3 60412
WP
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TSGN2
1L1 60414
CI
1M1 60415
1E1 60416
RB
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RBI
2K2 60418
RC
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WG
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WB
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TSGN
1L6 60423
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1L5 60436
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1K1 60438
WY
1E6 60439
2L1 60440
2K3 60441
1D4 60442
1E2 60443
CLGS
1M3 60444
T02
1N3 60445
2M3 60446
RIC
2N3 60447
+3VDC B POWER IN
+3VDC TO GATES
C1
C2
C3
C4
0 VDC

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79	↓	6.8 UF
C4	1006755-79	↓	6.8 UF

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3 SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
4. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
5. 2M5 -- 090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT
DRAWN J.F. Wald DATE 5/29/63
CHECKED
APPROVAL W.B. Turner 7/16/63
APPROVAL E.C. Hall by
NASA APPROVAL 7-17-63
MIT APPROVAL Wald 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

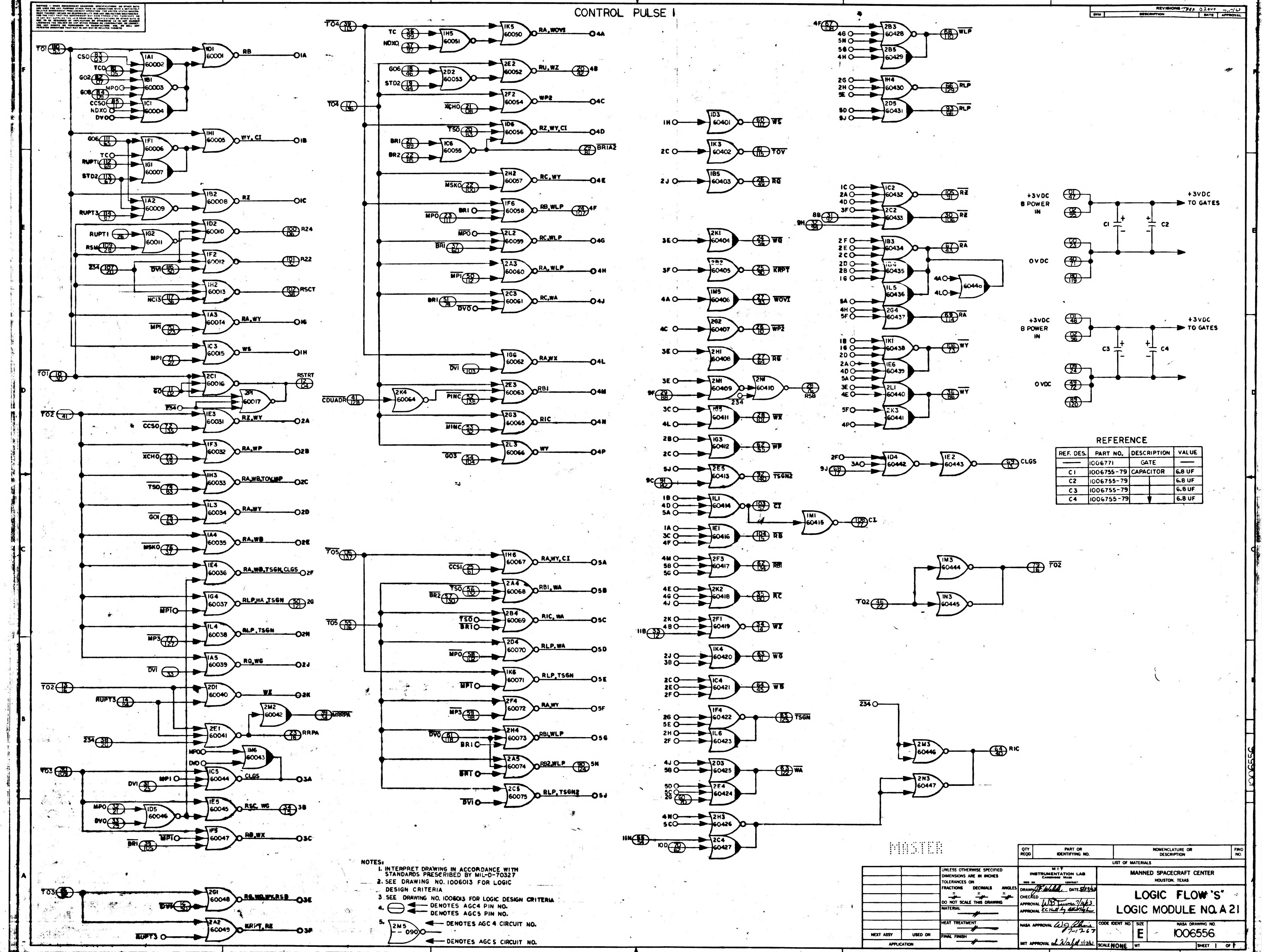
LOGIC FLOW "S"
LOGIC MODULE NO. A21

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006556
SCALE NONE | WT | SHEET 1 OF 1

1006556 A

INCHES
PHOTOGRAPHIC SCALE ONLY

CONTROL PULSE I



T01
CSO
TCO
GO2
GO8
MPO
CCSO
NDXO
DVO
1A1 60002
1B1 60003
1C1 60004
1D1 60001
RB
1A
GO6
TC
RUPT1
STD2
1F1 60006
1G1 60007
1H1 60005
WY, CI
1B
RUPT3
1A2 60009
1B2 60008
RZ
1C
RSM
1G2 60011
1D2 60010
R24
1F2 60012
R22
Z34
DVI
NC13
1H2 60013
RSCT
1A3 60014
RA, WY
1G
1C3 60015
WS
1H
MPI
2C1 60016
RSTRT
GO
2I1 60017
T02
1E3 60031
RZ, WY
2A
1F3 60032
RA, WP
2B
XCHO
1H3 60033
RA, WB, TOV, WP
2C
TSO
1L3 60034
RA, WY
2D
GO1
1A4 60035
RA, WB
2E
MSKO
1E4 60036
RA, WB, TSGN, CLGS
2F
1G4 60037
RLP, WA, TSGN
2G
1L4 60038
RLP, TSGN
2H
MP3
1A5 60039
RQ, WG
2J
2D1 60040
WZ
2K
2M2 60042
MRRPA
2E1 60041
RRPA
T03
1M6 60043
1C5 60044
CLGS
3A
1D5 60046
1E5 60045
RSC, WG
3B
BRI
1F5 60047
RB, WX
3C
2G1 60048
RG, WB, WY, RSB
3E
2A2 60049
KRPT, RZ
3F
T04
1H5 60051
1K5 60050
RA, WOVS
4A
2D2 60053
2E2 60052
RU, WZ
4B
2F2 60054
WP2
4C
1C6 60055
1D6 60056
RZ, WY, CI
4D
BRIA2
2H2 60057
RC, WY
4E
1F6 60058
RB, WLP
4F
2L2 60059
RC, WLP
4G
2A3 60060
RA, WLP
4H
2C3 60061
RC, WA
4J
1G6 60062
RA, WX
4L
CDUADR
2K4 60064
2E3 60063
RB1
4M
PINC
2G3 60065
RIC
4N
MINC
2L3 60066
WY
4P
GO3
T05
1H6 60067
RA, WY, CI
5A
CCSI
2A4 60068
RB1, WA
5B
BR2
2B4 60069
RIC, WA
5C
2D4 60070
RLP, WA
5D
1K6 60071
RLP, TSGN
5E
2F4 60072
RA, WY
5F
2H4 60073
RB1, WLP
5G
2A5 60074
RB2, WLP
5H
2C5 60075
RLP, TSGN2
5J
1D3 60401
WS
1K3 60402
TOV
1B5 60403
RQ
2K1 60404
WG
2B2 60405
KRPT
1M5 60406
WOVI
2G2 60407
WP2
2H1 60408
RG
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2N1 60410
RSB
1K5 60411
WX
1G3 60412
WP
2E5 60413
TSGN2
1L1 60414
CI
1M1 60415
1E1 60416
RB
2F3 60417
RB1
2K2 60418
RC
2F1 60419
WZ
1K4 60420
WG
1C4 60421
WB
1F4 60422
TSGN
1L6 60423
2D3 60425
WA
2E4 60424
2H3 60426
2C4 60427
2B3 60428
2B5 60429
WLP
1H4 60430
RLP
2D5 60431
RLP
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RZ
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RZ
1B3 60434
RA
1D4 60435
1L5 60436
60446
2G4 60437
RA
1K1 60438
WY
1E6 60439
2L1 60440
WY
2K3 60441
1D4 60442
1E2 60443
CLGS
1M3 60444
T02
1N3 60445
2M3 60446
RIC
2N3 60447
+3VDC
B POWER IN
+3VDC TO GATES
C1
C2
C3
C4
0 VDC
MASTER

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
4. ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
5. 2M5 090 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	1006755-79	↓	6.8 UF
C3	1006755-79		6.8 UF
C4	1006755-79		6.8 UF

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DRAWN J.F. Walsh DATE 5/29/63
CHECKED
APPROVAL WB Turner 7/16/63
APPROVAL EC Hall by Albert Hopkins
NASA APPROVAL W.J. Rhine 7-17-63
MIT APPROVAL D. Walsh 7/12/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

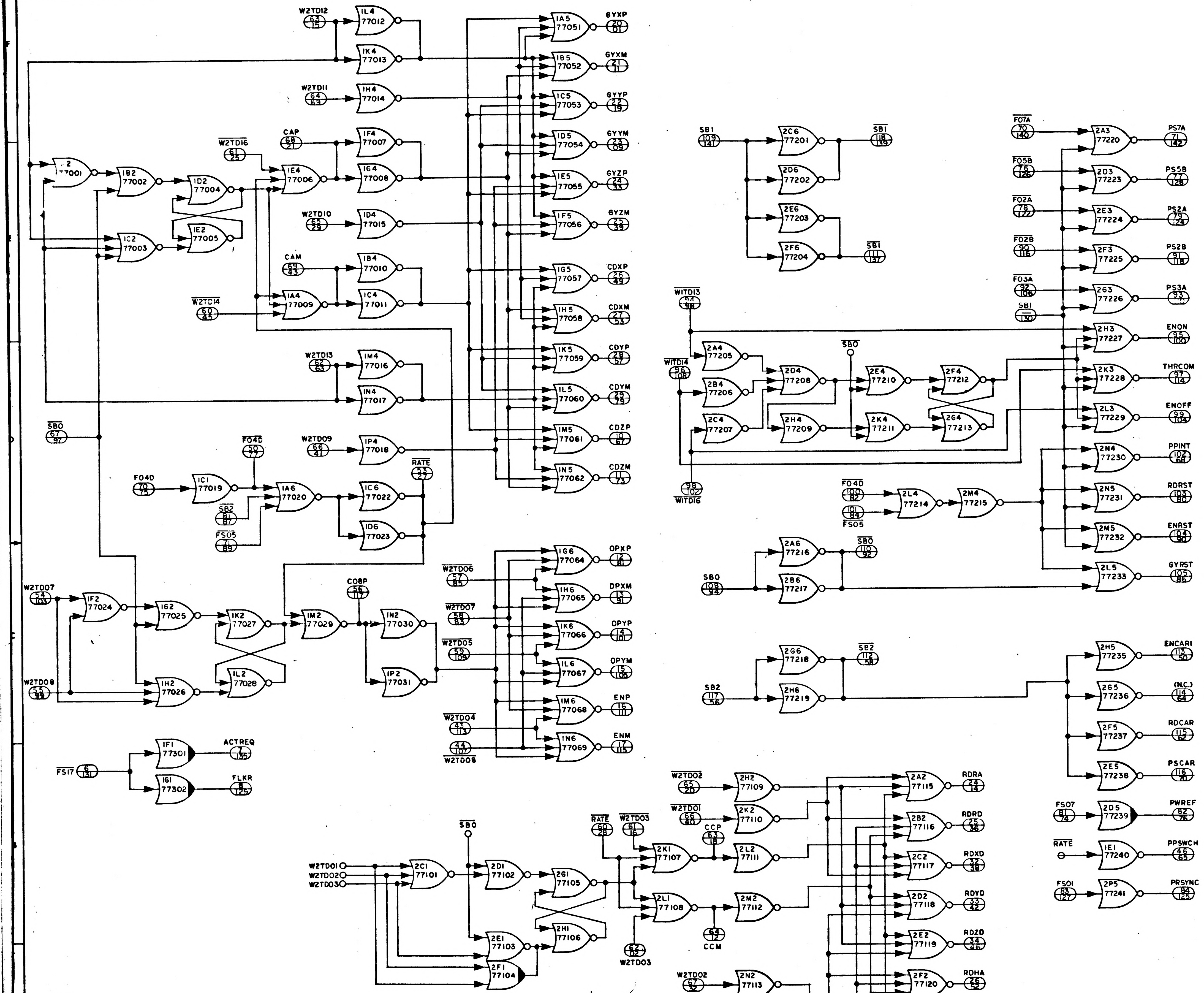
LOGIC FLOW "S"
LOGIC MODULE NO. A21

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006556
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS TDRR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03605	10-3-63	WK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4
3
2
1
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W2TD11
CAP
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W2TD10
CAM
W2TD14
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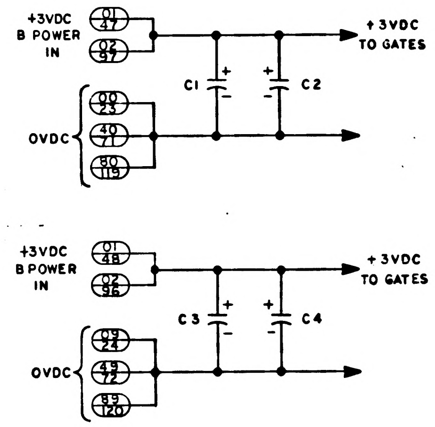
SB0
F04D
W2TD09
RATE
F04D
SB2
FS05
W2TD07
W2TD08
C08P
W2TD06
W2TD07
W2TD05
W2TD04
W2TD08
FS17
6YXP
6YXM
6YYP
6YYM
6YZP
6YZM
CDXP
CDXM
CDYP
CDYM
CDZP
CDZM
OPXP
DPXM
OPYP
OPYM
ENP
ENM
ACTREQ
FLKR
SB0
W2TD01
W2TD02
W2TD03
RATE
W2TD03
W2TD02
W2TD01
CCP
CCM
W2TD03
W2TD02
W2TD01
RDRA
RDRD
RDXD
RDYD
RDZD
RDHA
RDBS
SB1
SB1
SB1
W1TD13
W1TD14
W1TD16
SB0
F04D
FS05
SB0
SB0
SB2
SB2
F07A
F05B
F02A
F02B
F03A
SB1
PS7A
PS5B
PS2A
PS2B
PS3A
ENON
THRCOM
ENOFF
PPINT
RDRST
ENRST
GYRST
ENCARI
(N.C.)
RDCAR
PSCAR
FS07
RATE
FS01
PWREF
PPSWCH
PRSYNC

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓


+3VDC B POWER IN
01 47
02 97
+3VDC TO GATES
C1
C2
OVDC
00 23
40 71
80 119
+3VDC B POWER IN
01 48
02 96
+3VDC TO GATES
C3
C4
OVDC
09 24
49 72
89 120

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
4. 2M5 77020 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN A. DiLeo DATE 28 JUL 63
CHECKED
APPROVAL WB Duncan 20 AUG 63
APPROVAL Eldon C. Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL D Hoag 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

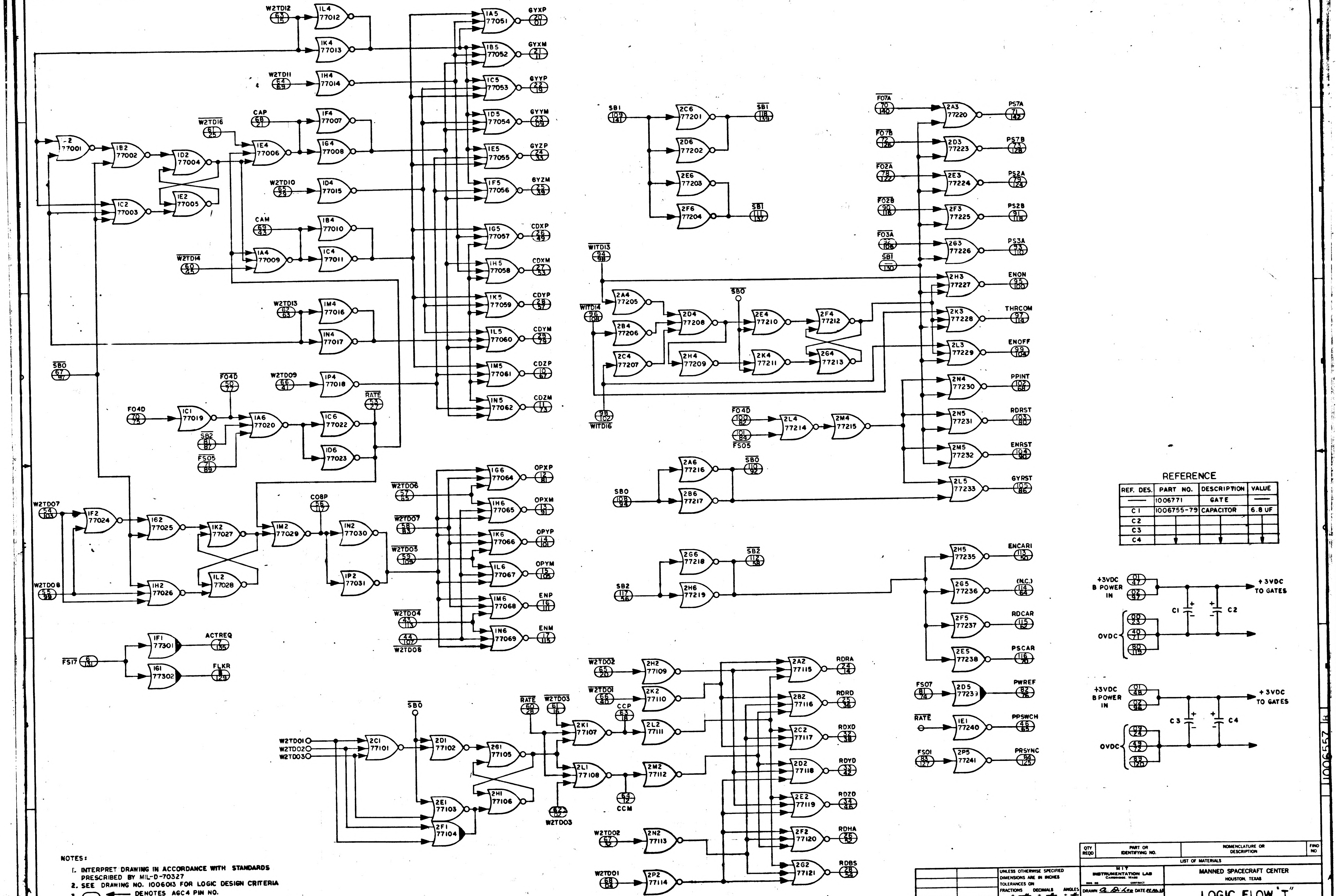
LOGIC FLOW "T"
MODULE NO. A36

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006557
SCALE — | WT — | SHEET 1 OF 1

1006557 A

SYM	REVISIONS TDRR 03694 DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03605	10-3-63	WH
B	REVISED PER TDRR 04159	10-21-63	WH

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.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W2TD11
1H4 77014
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1G4 77008
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1E4 77006
-2 77001
1B2 77002
1D2 77004
1C2 77003
1E2 77005
W2TD10
1D4 77015
CAM
1B4 77010
1A4 77009
1C4 77011
W2TD14
W2TD13
1M4 77016
1N4 77017
SB0
F04D
W2TD09
1P4 77018
RATE
1C1 77019
1A6 77020
1C6 77022
1D6 77023
SB2
FS05
1A5 77051 GYXP
1B5 77052 GYXM
1C5 77053 GYYP
1D5 77054 GYYM
1E5 77055 GYZP
1F5 77056 GYZM
1G5 77057 CDXP
1H5 77058 CDXM
1K5 77059 CDYP
1L5 77060 CDYM
1M5 77061 CDZP
1N5 77062 CDZM
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1F2 77024
1G2 77025
1K2 77027
1M2 77029
C08P
1N2 77030
1P2 77031
1H2 77026
1L2 77028
W2TD08
W2TD06
W2TD05
W2TD04
1G6 77064 OPXP
1H6 77065 OPXM
1K6 77066 OPYP
1L6 77067 OPYM
1M6 77068 ENP
1N6 77069 ENM
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1F1 77301 ACTREQ
1G1 77302 FLKR
SB1
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2D6 77202
2E6 77203
2F6 77204
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W1TD14
W1TD16
2A4 77205
2B4 77206
2C4 77207
2D4 77208
2H4 77209
2E4 77210
2K4 77211
2F4 77212
2G4 77213
F04D
FS05
2L4 77214
2M4 77215
2A6 77216
2B6 77217
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SB2
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F07B
F02A
F02B
F03A
2A3 77220 PS7A
2D3 77223 PS7B
2E3 77224 PS2A
2F3 77225 PS2B
2G3 77226 PS3A
2H3 77227 ENON
2K3 77228 THRCOM
2L3 77229 ENOFF
2N4 77230 PPINT
2N5 77231 RDRST
2M5 77232 ENRST
2L5 77233 GYRST
2H5 77235 ENCARI
2G5 77236 (N.C.)
2F5 77237 RDCAR
2E5 77238 PSCAR
FS07
2D5 77239 PWREF
RATE
1E1 77240 PPSWCH
FS01
2P5 77241 PRSYNC
+3VDC B POWER IN
+3VDC TO GATES
C1
C2
C3
C4
OVDC
W2TD01
W2TD02
W2TD03
2C1 77101
2D1 77102
2B1 77105
2E1 77103
2F1 77104
2H1 77106
CCP
2K1 77107
2L1 77108
CCM
2H2 77109
2K2 77110
2L2 77111
2M2 77112
2N2 77113
2P2 77114
2A2 77115 RDRA
2B2 77116 RDRD
2C2 77117 RDXD
2D2 77118 RDYD
2E2 77119 RDZD
2F2 77120 RDHA
2G2 77121 RDBS

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2			
C3			
C4			

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
4. 2M5 77090 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN A. Di Leo DATE 22 Aug 63
CHECKED
APPROVAL DB 20 Aug 63
APPROVAL Eldon C. Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

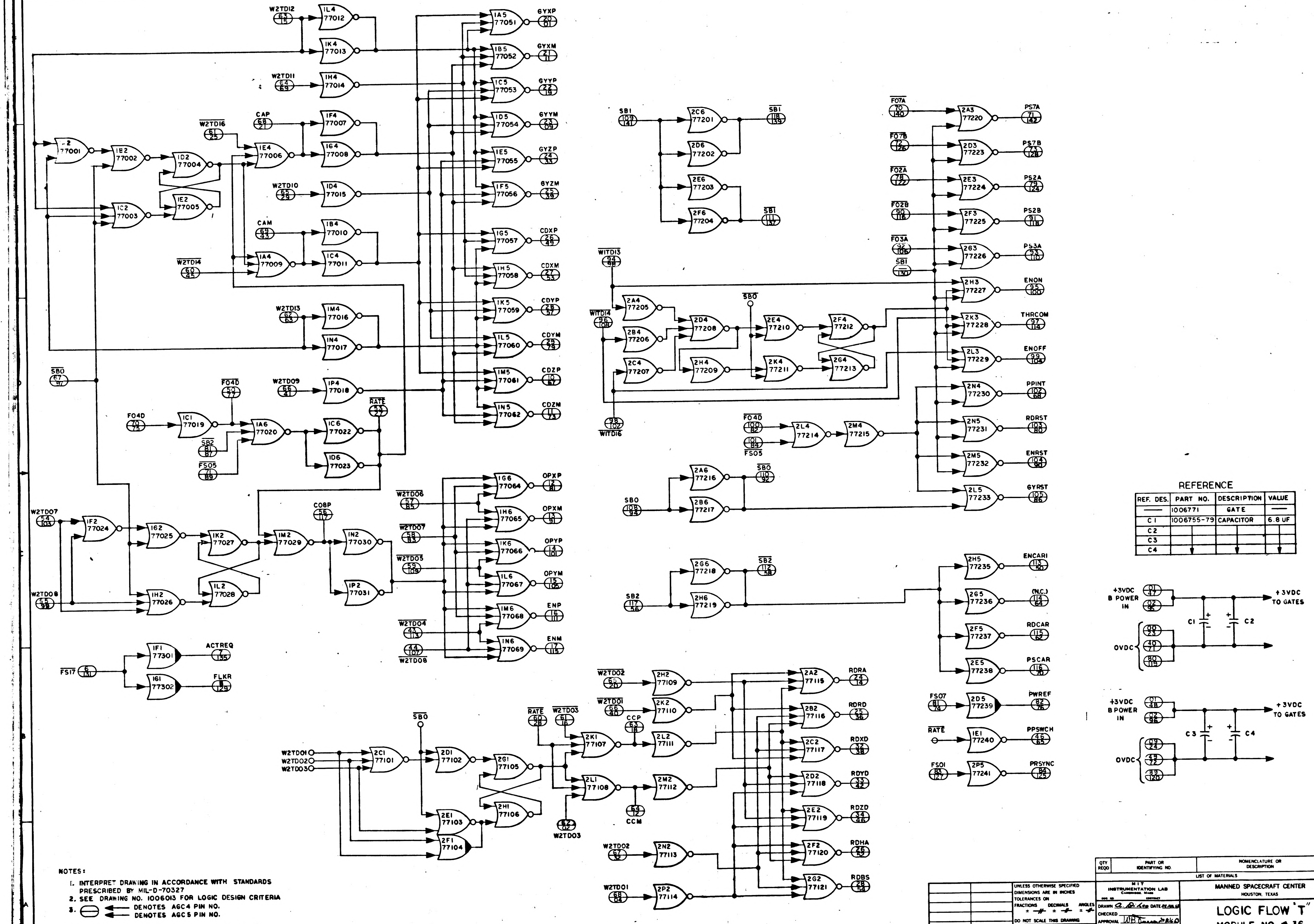
LOGIC FLOW "T"
MODULE NO. A 36

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006557
SCALE — WT — SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 02694

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03605	8-2-63	WK
B	REVISED PER TDRR 04159	10-21-63	WK
C	REVISED PER TDRR 04523	11-6-63	WK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CAP
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CAM
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F04D
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RATE
SB2
FS05
W2TD07
W2TD08
C0BP
W2TD06
W2TD05
W2TD04
FS17
6YXP
GYXM
GYYP
GYYM
GYZP
6YZM
CDXP
CDXM
CDYP
CDYM
CDZP
CDZM
OPXP
OPXM
OPYP
OPYM
ENP
ENM
ACTREQ
FLKR
SB1
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W1TD14
W1TD16
F07A
F07B
F02A
F02B
F03A
PS7A
PS7B
PS2A
PS2B
PS3A
ENON
THRCOM
ENOFF
PPINT
RDRST
ENRST
GYRST
ENCARI
(N.C.)
RDCAR
PSCAR
FS07
FS01
PWREF
PPSWCH
PRSYNC
W2TD01
W2TD02
W2TD03
CCP
CCM
RDRA
RDRD
RDXD
RDYD
RDZD
RDHA
RDBS
+3VDC B POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO. ← DENOTES AGC5 PIN NO.
4. 2M5 77090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN A. DiLeo DATE 22 JUL 63
CHECKED
APPROVAL W.B. Duncan 20 Aug 63
APPROVAL Eldon C. Hall 20 Aug 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "T"
MODULE NO. A36

CODE IDENT NO. —
SIZE E
NASA DRAWING NO. 1006557
SCALE — WT — SHEET 1 OF 1

1006557

INCHES
PHOTOGRAPHIC SCALE ONLY

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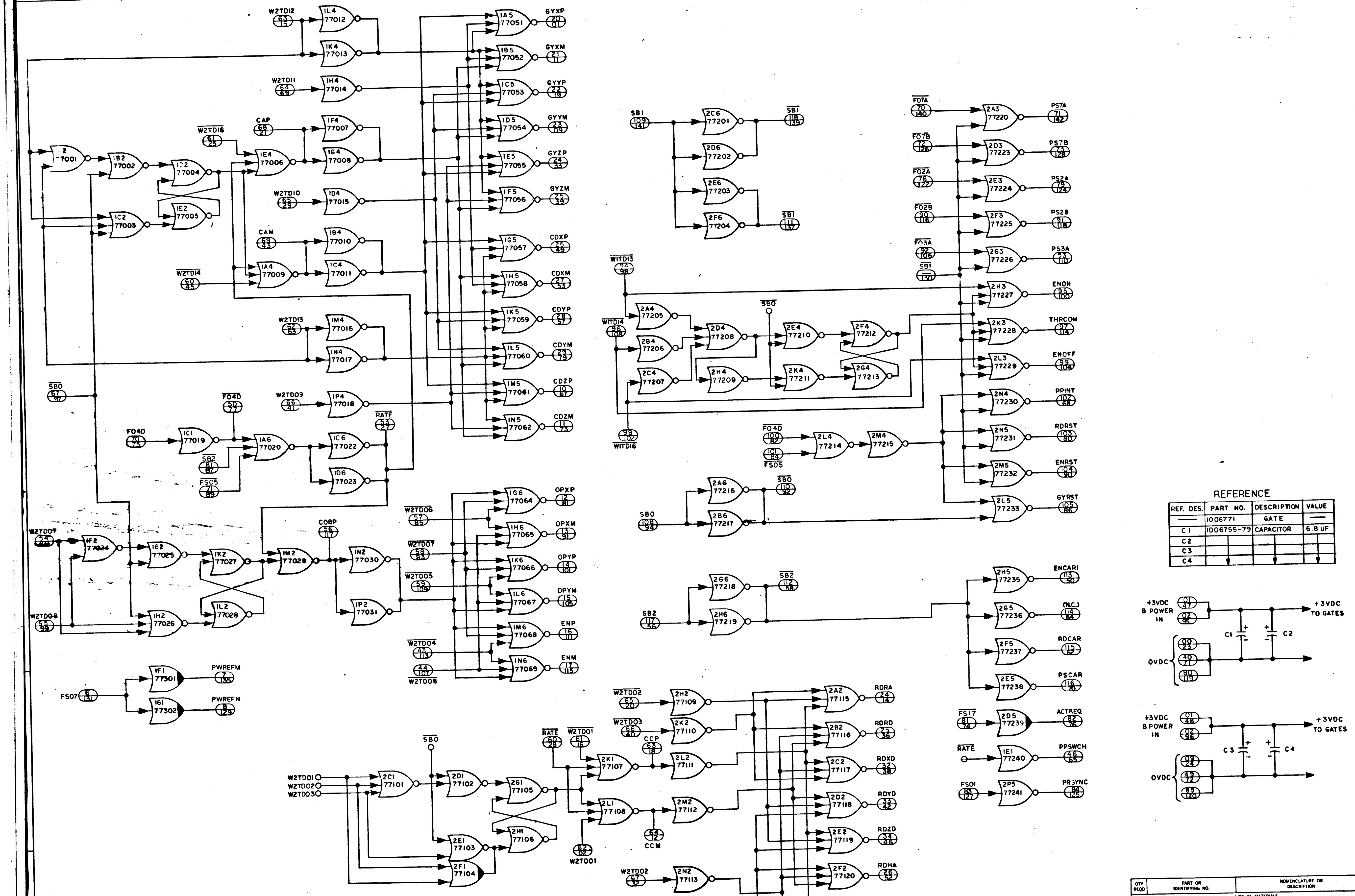
REVISIONS TDRR 02694			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03605	8-2-63	WK
B	REVISED PER TDRR 04159	10-21-63	WK
C	REVISED PER TDRR 04523	11-6-63	WK
D	REVISED PER TDRR 06035	29 Jan 64	



W2TD12
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CAP
W2TD10
CAM
W2TD14
W2TD13
SB0
F04D
W2TD09
RATE
F04D
SB2
FS05
C08P
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FS07
PWREFM
PWREFN
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GYXM
GYYP
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GYZM
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CDYM
CDZP
CDZM
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OPYP
OPYM
ENP
ENM
SB1
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W1TD14
W1TD16
F07A
F07B
F02A
F02B
F03A
PS7A
PS7B
PS2A
PS2B
PS3A
ENON
THRCOM
ENOFF
PPINT
RDRST
ENRST
GYRST
ENCARI
(N.C.)
RDCAR
PSCAR
FS17
ACTREQ
PPSWCH
FS01
PRSYNC
W2TD01
W2TD02
W2TD03
CCP
CCM
RDRA
RDRD
RDXD
RDYD
RDZD
RDHA
RDBS
+3VDC B POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC4 PIN NO.
   ← DENOTES AGC5 PIN NO.
4. 2M5 77090 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN A. DiLeo DATE 22 Jul 63
CHECKED
APPROVAL WB Tunnan 20 Aug 63
APPROVAL Eldon C. Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL

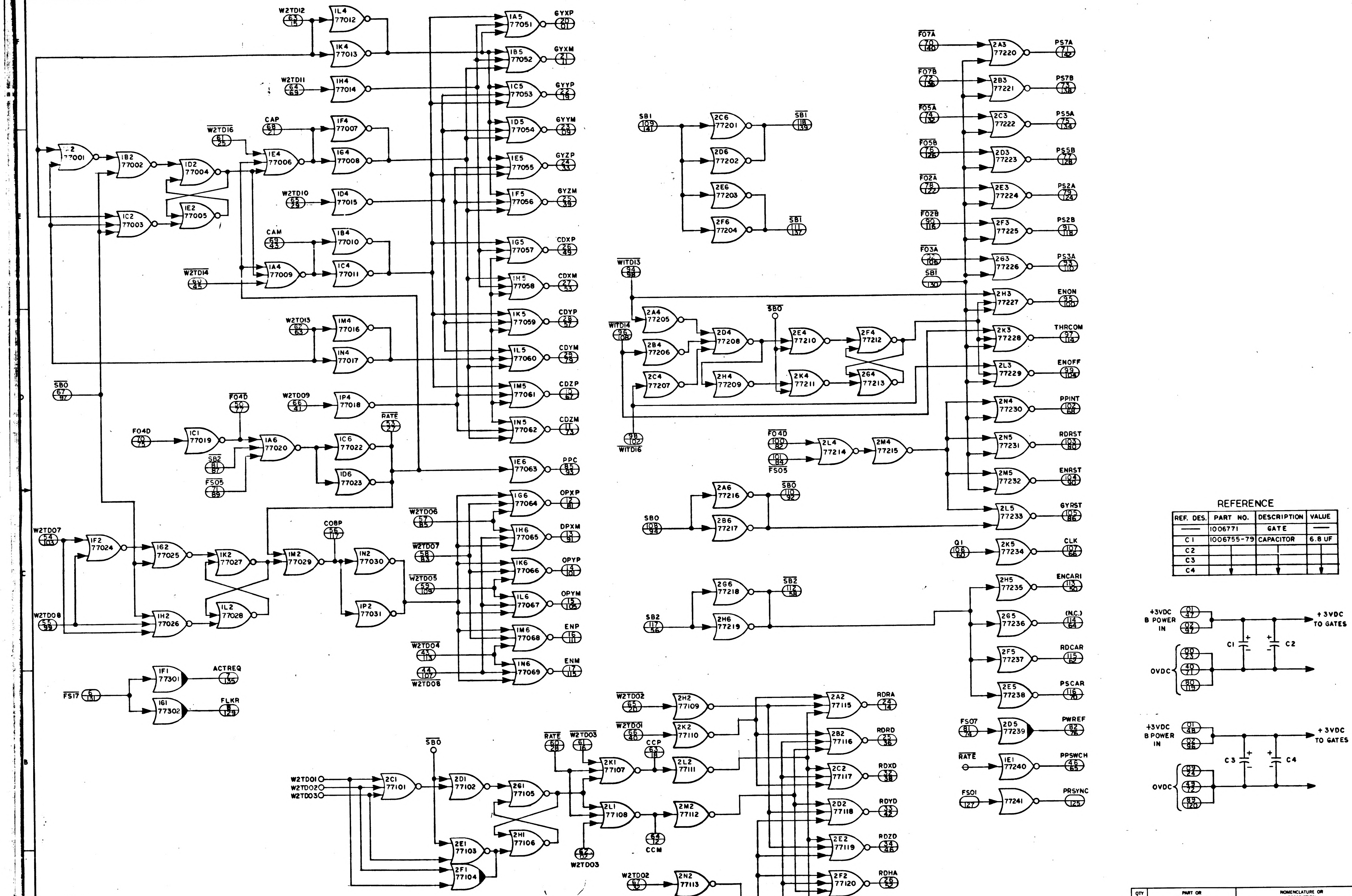
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "T"
MODULE NO. A36

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	E	1006557

SCALE — WT — SHEET 1 OF 1

1006557 C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IK4 77013
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IF4 77007
IE4 77006
IG4 77008
W2TDI0
ID4 77015
CAM
IB4 77010
W2TDI4
IA4 77009
IC4 77011
I2 77001
IB2 77002
ID2 77004
IC2 77003
IE2 77005
W2TDI3
IM4 77016
IN4 77017
SBO
W2TD09
IP4 77018
FO4D
IC1 77019
IA6 77020
SB2
FS05
RATE
IC6 77022
ID6 77023
IA5 77051 GYXP
IB5 77052 GYXM
IC5 77053 GYYP
ID5 77054 GYYM
IE5 77055 GYZP
IF5 77056 GYZM
IG5 77057 CDXP
IH5 77058 CDXM
IK5 77059 CDYP
IL5 77060 CDYM
IM5 77061 CDZP
IN5 77062 CDZM
IE6 77063 PPC
IG6 77064 OPXP
IH6 77065 DPXM
IK6 77066 OPYP
IL6 77067 OPYM
IM6 77068 ENP
IN6 77069 ENM
W2TD06
W2TD07
W2TD05
W2TD04
W2TD08
COBP
IF2 77024
I62 77025
IH2 77026
IK2 77027
IL2 77028
IM2 77029
IN2 77030
IP2 77031
FS17
IF1 77301 ACTREQ
I61 77302 FLKR
W2TD01
W2TD02
W2TD03
2C1 77101
2D1 77102
2G1 77105
2H1 77106
2E1 77103
2F1 77104
2K1 77107
2L1 77108
CCP
CCM
2H2 77109
2K2 77110
2L2 77111
2M2 77112
2N2 77113
2P2 77114
2A2 77115 RDRA
2B2 77116 RDRD
2C2 77117 RDXD
2D2 77118 RDYD
2E2 77119 RDZD
2F2 77120 RDHA
2G2 77121 RDBS
SB1
2C6 77201
2D6 77202
2E6 77203
2F6 77204
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W1TDI4
W1TDI6
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2B4 77206
2C4 77207
2D4 77208
2H4 77209
2E4 77210
2K4 77211
2F4 77212
2G4 77213
FO4D
FS05
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2M4 77215
2A6 77216
2B6 77217
2G6 77218
2H6 77219
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F07A
F07B
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F05B
F02A
F02B
F03A
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2B3 77221 PS7B
2C3 77222 PS5A
2D3 77223 PS5B
2E3 77224 PS2A
2F3 77225 PS2B
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2H3 77227 ENON
2K3 77228 THRCOM
2L3 77229 ENOFF
2N4 77230 PPINT
2N5 77231 RDRST
2M5 77232 ENRST
2L5 77233 GYRST
2K5 77234 CLK
2H5 77235 ENCARI
2G5 77236 (N.C.)
2F5 77237 RDCAR
2E5 77238 PSCAR
FS07
2D5 77239 PWREF
1E1 77240 PPSWCH
FS01
77241 PRSYNC
+3VDC B POWER IN
+3VDC TO GATES
C1
C2
C3
C4
OVDC

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2			
C3			
C4			

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. DENOTES AGC4 PIN NO.
   DENOTES AGC5 PIN NO.
4. 2M5 77090 DENOTES AGC 4 CIRCUIT NO.
   DENOTES AGC 5 CIRCUIT NO.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

NEXT ASSY USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN A. DiLeo DATE 28 JUL 63
CHECKED
APPROVAL WB Denson 20 AUG 63
APPROVAL Eldon C Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL D Hoag 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "T"
MODULE NO. A 36

CODE IDENT NO.
SIZE E
NASA DRAWING NO 1006557
SCALE — WT — SHEET 1 OF 1

1006557

INCHES
PHOTOGRAPHIC SCALE ONLY

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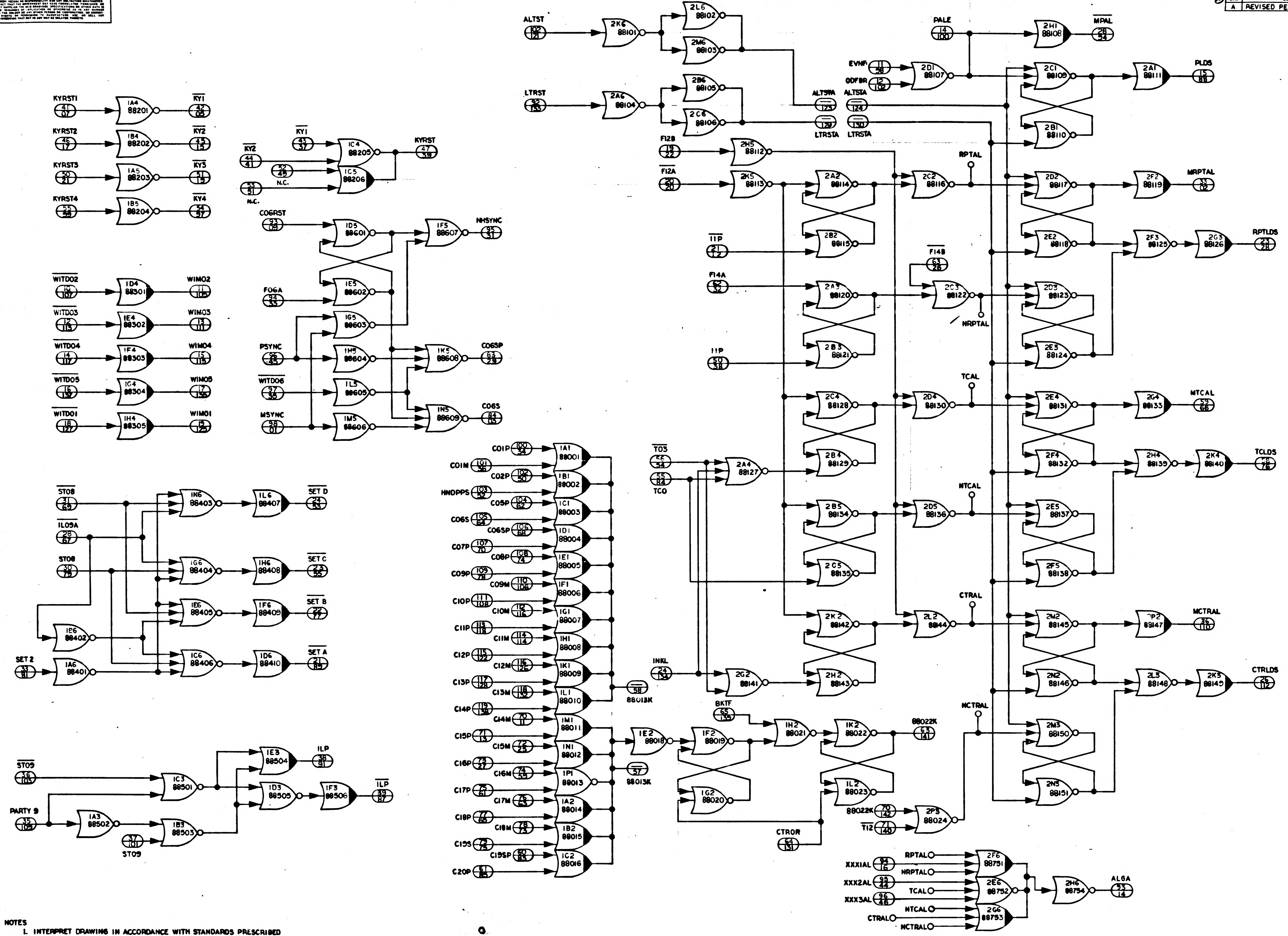
REVISIONS 03139

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03608	10-3-63	



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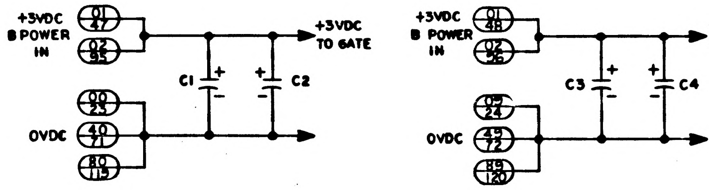
KYRST2 46/17 → 1B4 88202 → KY2 45/15
KYRST3 50/21 → 1A5 88203 → KY3 51/19
KYRST4 55/59 → 1B5 88204 → KY4 54/97
KY1 43/37, KY2 44/41, 52/49 N.C., 53/51 N.C. → 1C4 88205, 1C5 88206 → KYRST 47/39
WITD02 10/107 → 1D4 88301 → WIM02 11/105
WITD03 12/113 → 1E4 88302 → WIM03 13/111
WITD04 14/117 → 1F4 88303 → WIM04 15/115
WITD05 16/137 → 1G4 88304 → WIM05 17/135
WITD01 18/127 → 1H4 88305 → WIM01 19/125
C06RST 93/09 → 1D5 88601
F06A 94/33 → 1E5 88602
PSYNC 96/45 → 1G5 88603, 1H5 88604
WITD06 97/35 → 1L5 88605
MSYNC 98/01 → 1M5 88606
1F5 88607 → NHSYNC 95/31
1K5 88608 → C06SP 83/29
1N5 88609 → C06S 84/03
ST08 31/69, IL09A 28/67, ST08 30/79, SET 2 33/81
1A6 88401, 1E6 88402, 1K6 88403, 1G6 88404, 1E6 88405, 1C6 88406
1L6 88407 → SET D 24/53
1H6 88408 → SET C 23/55
1F6 88409 → SET B 22/77
1D6 88410 → SET A 21/89
ST09 36/103, PARTY 9 35/109, ST09 37/101
1C3 88501, 1A3 88502, 1B3 88503
1E3 88504 → ILP 38/91
1D3 88505 → 1F3 88506 → ILP 39/87
C01P 100/34, C01M 101/36, C02P 102/50, HNDPPS 103/52, C05P 104/62, C06S 105/64, C06SP 106/68, C07P 107/70, C08P 108/74, C09P 109/78, C09M 110/106, C10P 111/108, C10M 112/116, C11P 113/118, C11M 114/114, C12P 115/122, C12M 116/126, C13P 117/128, C13M 118/132, C14P 119/138, C14M 70/11, C15P 71/13, C15M 72/25, C16P 73/27, C16M 74/33, C17P 75/61, C17M 76/63, C18P 77/65, C18M 78/73, C19S 79/75, C19SP 60/83, C20P 61/85
1A1 88001, 1B1 88002, 1C1 88003, 1D1 88004, 1E1 88005, 1F1 88006, 1G1 88007, 1H1 88008, 1K1 88009, 1L1 88010, 1M1 88011, 1N1 88012, 1P1 88013, 1A2 88014, 1B2 88015, 1C2 88016
58 88013K
57 88013K
1E2 88018, 1F2 88019, 1G2 88020
BKTF 65/139 → 1H2 88021
1K2 88022 → 88022K 63/141
1L2 88023
CTROR 64/131
88022K 70/142, T12 71/140 → 2P3 88024
ALTST 102/121 → 2K6 88101 → 2L6 88102, 2M6 88103
LTRST 92/133 → 2A6 88104 → 2B6 88105, 2C6 88106
ALTSTA 123, ALTSTA 124, LTRSTA 129, LTRSTA 130
PALE 14/100
EVNF 11/58, ODFBR 12/102 → 2D1 88107
2H1 88108 → MPAL 28/54
2C1 88109, 2B1 88110 → 2A1 88111 → PLDS 15/88
F12B 19/22 → 2H5 88112
F12A 20/20 → 2K5 88113
2A2 88114, 2B2 88115
I1P 21/12
2C2 88116 → RPTAL
2D2 88117, 2E2 88118
2F2 88119 → MRPTAL 33/02
F14A 62/32 → 2A3 88120
11P 50/38 → 2B3 88121
F14B 63/26 → 2C3 88122 → NRPTAL
2D3 88123, 2E3 88124
2F3 88125 → 2G3 88126 → RPTLDS 23/28
T03 56/54, TC0 55/84 → 2A4 88127
2C4 88128, 2B4 88129
2D4 88130 → TCAL
2E4 88131, 2F4 88132
2G4 88133 → MTCAL 59/66
2B5 88134, 2C5 88135
2D5 88136 → NTCAL
2E5 88137, 2F5 88138
2H4 88139 → 2K4 88140 → TCLDS 58/76
INKL 24/134 → 2G2 88141
2K2 88142, 2H2 88143
2L2 88144 → CTRAL
2M2 88145, 2N2 88146
2P2 88147 → MCTRAL 36/110
2L3 88148 → 2K3 88149 → CTRLDS 26/112
NCTRAL
2M3 88150, 2N3 88151
RPTAL, XXX1AL 94/16, NRPTAL → 2F6 88751
XXX2AL 95/44, TCAL, XXX3AL 96/46 → 2E6 88752
NTCAL, CTRAL, NCTRAL → 2G6 88753
2H6 88754 → ALGA 93/14

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO. ← DENOTES AGC 5 PIN NO.
4. 1A3 88502 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2			
C3			
C4			

REFERENCE



+3VDC B POWER IN
01/47
02/95
00/23
OVDC
40/71
80/115
C1
C2
+3VDC TO GATE
+3VDC B POWER IN
01/48
02/96
09/24
OVDC
49/72
89/120
C3
C4
+3VDC TO GATE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C.D. Sullivan DATE 22 Aug 63
CHECKED
APPROVAL W.B. Turner 9/10/63
APPROVAL Eldon C. Hall 12 Aug 63
NASA APPROVAL 9 Oct 63
MIT APPROVAL 12 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

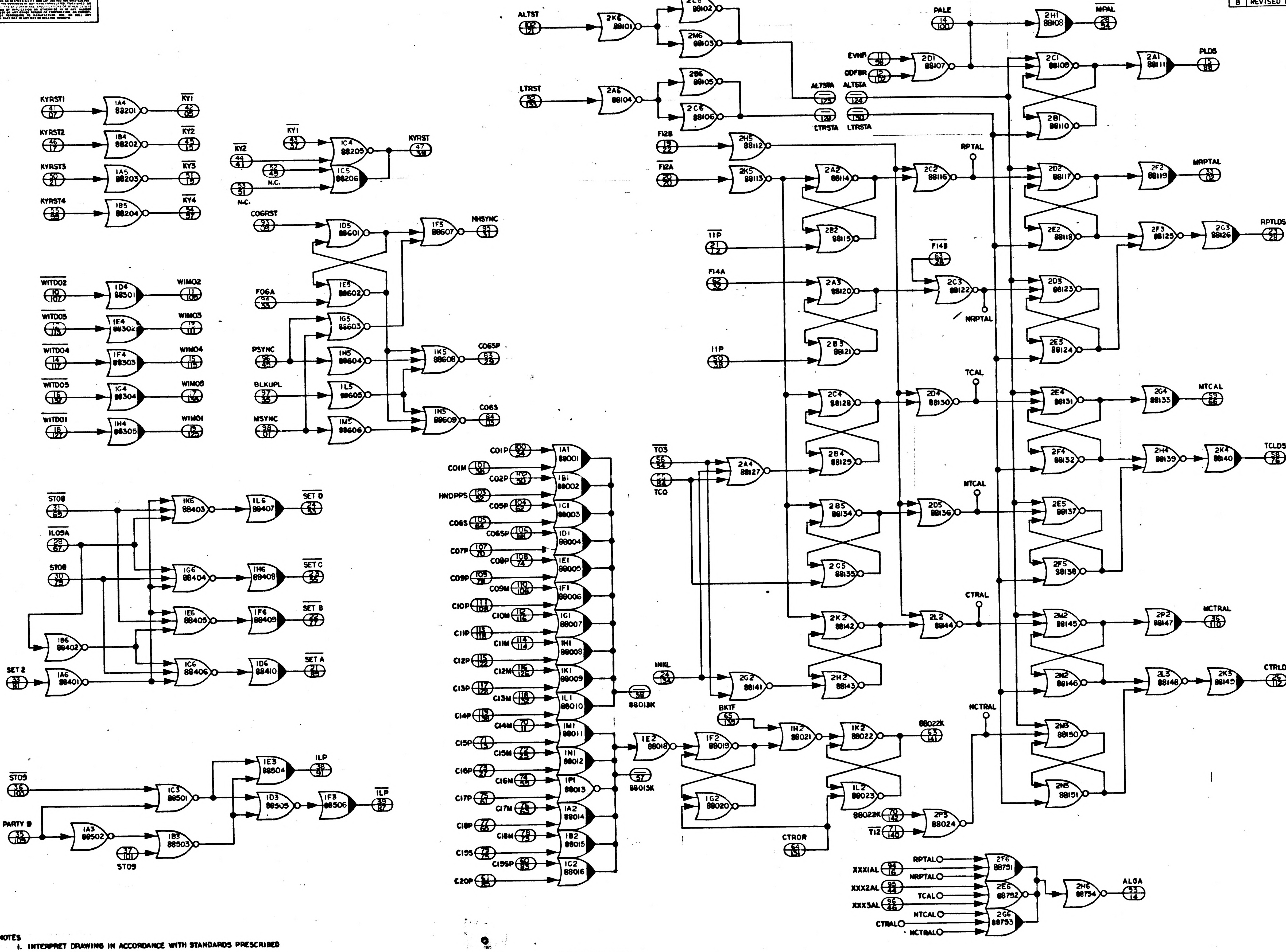
LOGIC FLOW "V"
LOGIC MODULE NO. A29

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006559
SCALE — WT SHEET 1 OF 1

1006559

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03608	10-3-63	WK
B	REVISED PER TDRR 04148	10/21/63	WK

REVISIONS 03139



ALTST
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2M6 88103
2A6 88104
2B6 88105
2C6 88106
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2H1 88108
MPAL
EVNP
ODFBR
2D1 88107
2C1 88109
2B1 88110
2A1 88111
PLDS
ALTSTA
LTRSTA
F12B
F12A
2H5 88112
2K5 88113
2A2 88114
2B2 88115
2C2 88116
RPTAL
2D2 88117
2E2 88118
2F2 88119
MRPTAL
2F3 88125
2G3 88126
RPTLDS
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F14A
2A3 88120
2B3 88121
2C3 88122
NRPTAL
2D3 88123
2E3 88124
TCAL
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2B4 88129
2D4 88130
2E4 88131
2G4 88133
MTCAL
2F4 88132
2H4 88139
2K4 88140
TCLDS
T03
TC0
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MTCAL
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2C5 88135
2D5 88136
2E5 88137
2F5 88138
CTRAL
2K2 88142
2H2 88143
2L2 88144
2M2 88145
2P2 88147
MCTRAL
INKL
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2N2 88146
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2K3 88149
CTRLDS
NCTRAL
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BKTF
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88022K
T12
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CTROR
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2G6 88753
2H6 88754
XXX1AL
XXX2AL
XXX3AL
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NRPTAL
TCAL
NTCAL
CTRAL
NCTRAL
ALGA
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KYRST2
KYRST3
KYRST4
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KY1
KY2
KY3
KY4
1C4 88205
1C5 88206
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N.C.
C06RST
F06A
PSYNC
BLKUPL
MSYNC
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1E5 88602
1G5 88603
1H5 88604
1L5 88605
1M5 88606
1F5 88607
1K5 88608
1N5 88609
NHSYNC
C06SP
C06S
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WITD03
WITD04
WITD05
WITD01
1D4 88301
1E4 88302
1F4 88303
1G4 88304
1H4 88305
WIM02
WIM03
WIM04
WIM05
WIM01
ST08
IL09A
ST08
SET 2
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1G6 88404
1E6 88405
1C6 88406
1B6 88402
1A6 88401
1L6 88407
1H6 88408
1F6 88409
1D6 88410
SET D
SET C
SET B
SET A
ST09
PARTY 9
1C3 88501
1A3 88502
1B3 88503
1E3 88504
1D3 88505
1F3 88506
ILP
ILP
ST09
C01P
C01M
C02P
HNDPPS
C05P
C06S
C06SP
C07P
C08P
C09P
C09M
C10P
C10M
C11P
C11M
C12P
C12M
C13P
C13M
C14P
C14M
C15P
C15M
C16P
C16M
C17P
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C18P
C18M
C15S
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C20P
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1D1 88004
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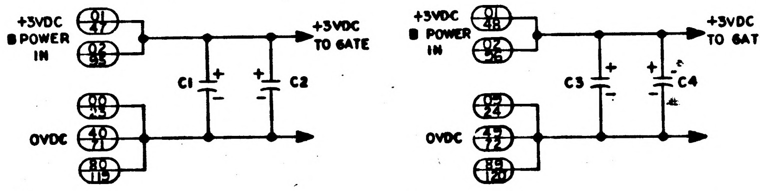
1G1 88007
1H1 88008
1K1 88009
1L1 88010
1M1 88011
1N1 88012
1P1 88013
1A2 88014
1B2 88015
1C2 88016
88013K

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO.
   ← DENOTES AGC 5 PIN NO.
4. 1A3 88502 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2			
C3			
C4			

REFERENCE



+3VDC B POWER IN
+3VDC TO GATE
C1
C2
0VDC
+3VDC B POWER IN
+3VDC TO GATE
C3
C4
0VDC

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN DATE
CHECKED
APPROVAL W B Turner 9/10/63
APPROVAL Eldon C. Hall 12 Sept 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "V"
LOGIC MODULE NO. A29

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006559
SCALE — | WT | SHEET 1 OF 1

1006559 A

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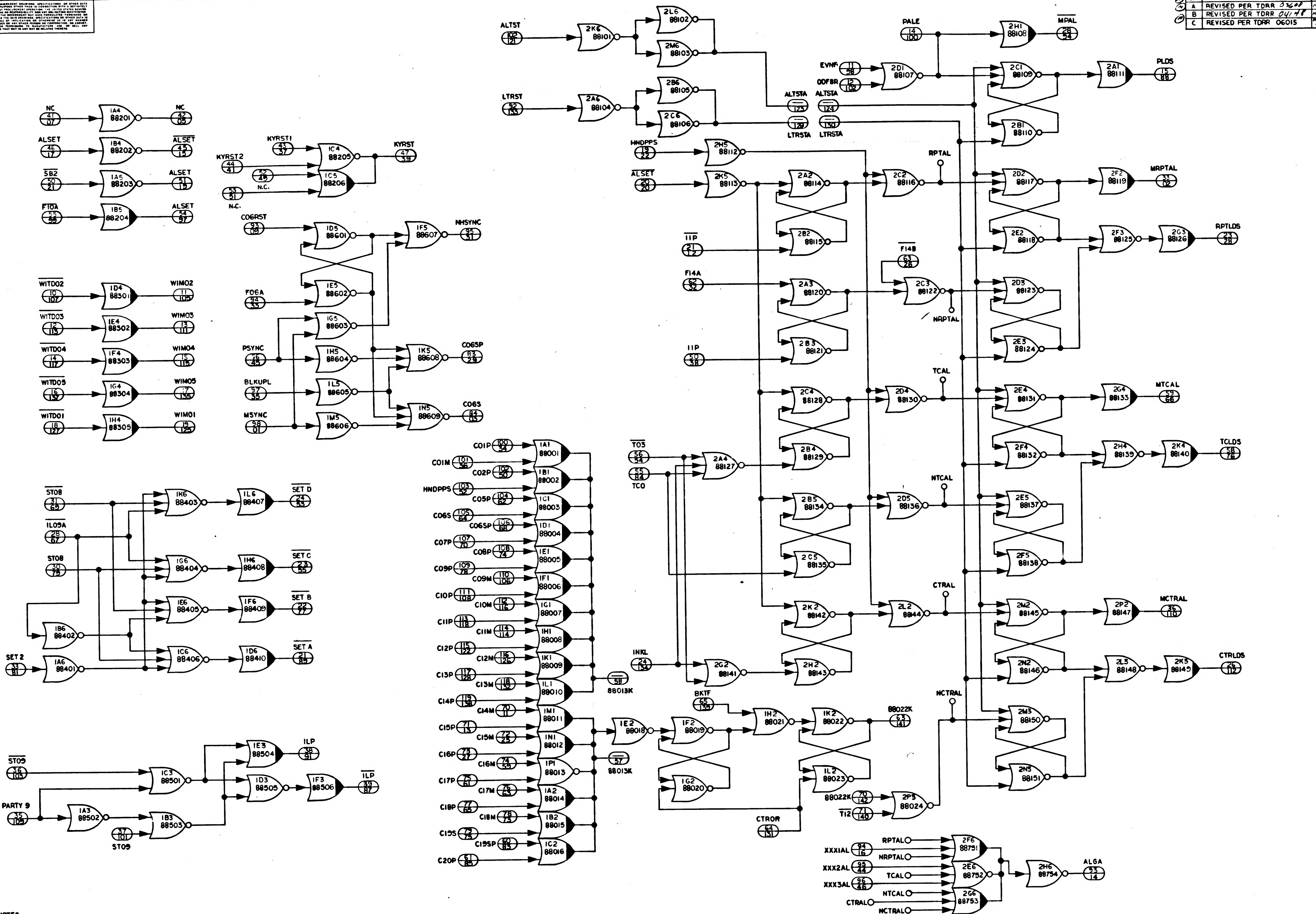
REVISIONS 03134

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03608	10-3-63	WK
B	REVISED PER TDRR 04148	10/21/63	WK
C	REVISED PER TDRR 06015	31 Jan 64	JFB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LTRST
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MPAL
EVNF
ODFBR
2D1 88107
2C1 88109
2B1 88110
2A1 88111
PLDS
ALTSTA
LTRSTA
HNDPPS
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ALSET
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2B2 88115
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RPTAL
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MRPTAL
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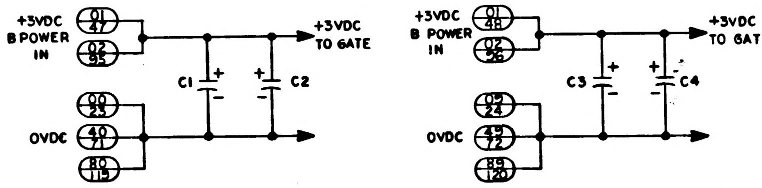
88022K
1L2 88023
2P3 88024
T12
CTROR
ST09
PARTY 9
1C3 88501
1A3 88502
1B3 88503
1E3 88504
ILP
1D3 88505
1F3 88506
ILP
ST09
XXX1AL
XXX2AL
XXX3AL
RPTAL
NRPTAL
TCAL
NTCAL
CTRAL
NCTRAL
2F6 88751
2E6 88752
2G6 88753
2H6 88754
ALGA

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO.
   ← DENOTES AGC 5 PIN NO.
4. 1A3 88502 ← DENOTES AGC 4 CIRCUIT NO.
   ← DENOTES AGC 5 CIRCUIT NO.

REFERENCE


+3VDC
B POWER IN
+3VDC TO GATE
C1
C2
OVDC
+3VDC
B POWER IN
+3VDC TO GATE
C3
C4
OVDC

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY
USED ON
APPLICATION

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT
DRAWN D.Sullivan DATE 22 Aug 63
CHECKED
APPROVAL W.B. Turner 9/10/63
APPROVAL Eldon C. Hall 12 Sept 63
NASA APPROVAL 9/12/63
MIT APPROVAL 12 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "V"
LOGIC MODULE NO. A29

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006559
SCALE —
WT
SHEET 1 OF 1

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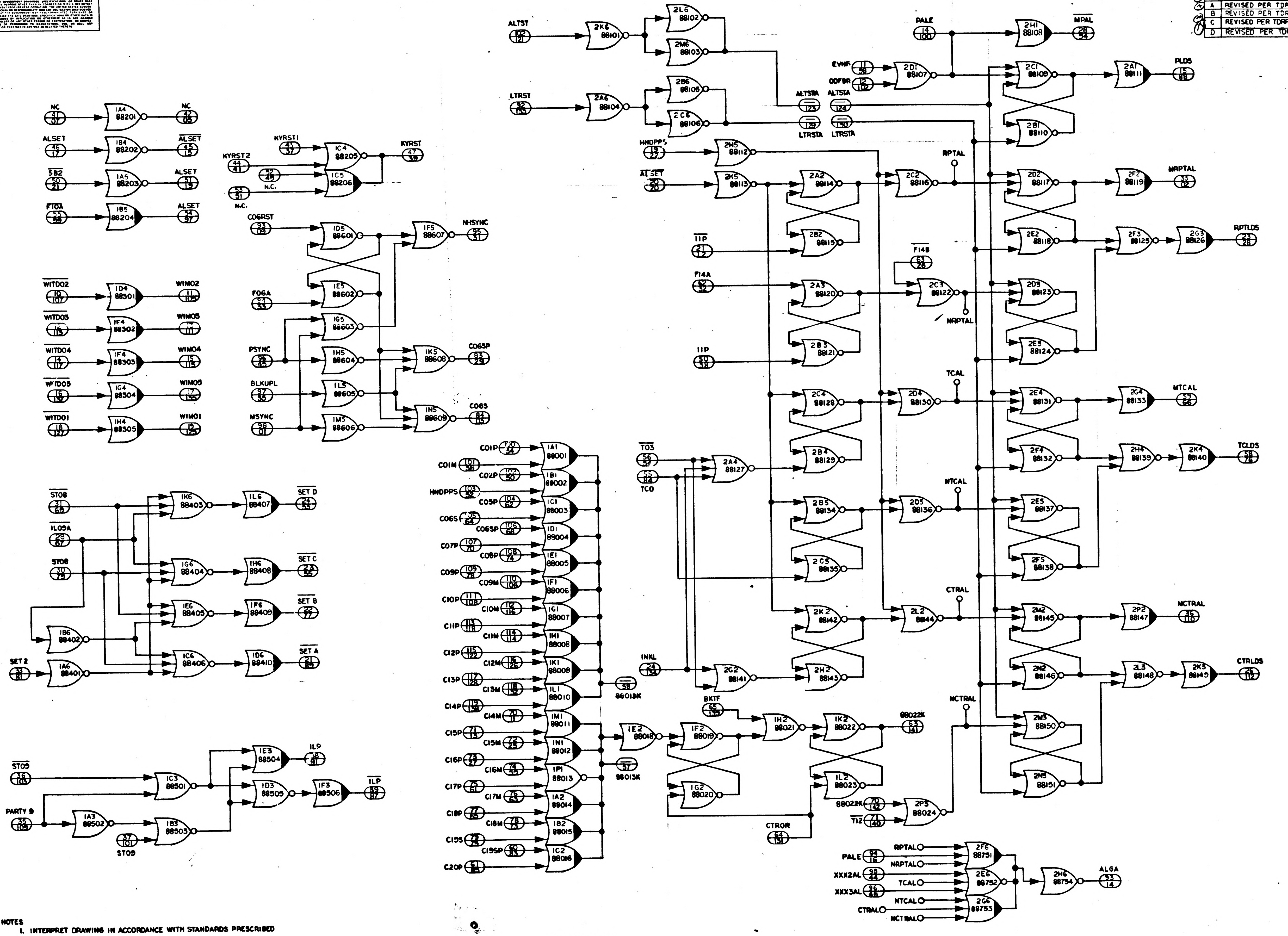
REVISIONS 03138

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03608	10-3-63	
B	REVISED PER TDRR 04148	10/21/63	
C	REVISED PER TDRR 06015		
D	REVISED PER TDRR 06234		



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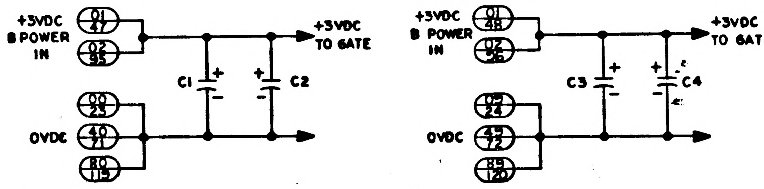
ALSET
1B4 88202
5B2
1A5 88203
F10A
1B5 88204
KYRST1
KYRST2
1C4 88205
1C5 88206
N.C.
KYRST
C06RST
1D5 88601
1F5 88607
NHSYNC
F06A
1E5 88602
1G5 88603
PSYNC
1H5 88604
1K5 88608
C06SP
BLKUPL
1L5 88605
MSYNC
1M5 88606
1N5 88609
C06S
WITD02
1D4 88501
WIM02
WITD03
1F4 88502
WIM03
WITD04
1F4 88503
WIM04
WITD05
1G4 88504
WIM05
WITD01
1H4 88505
WIM01
ST08
1K6 88403
1L6 88407
SET D
1L09A
ST08
1G6 88404
1H6 88408
SET C
1E6 88405
1F6 88409
SET B
1B6 88402
SET 2
1A6 88401
1C6 88406
1D6 88410
SET A
ST09
1C3 88501
1E3 88504
ILP
PARTY 9
1A3 88502
1D3 88505
1F3 88506
ILP
1B3 88503
ST09
C01P
C01M
C02P
HNDPPS
C05P
C06S
C06SP
C07P
C08P
C09P
C09M
C10P
C10M
C11P
C11M
C12P
C12M
C13P
C13M
C14P
C14M
C15P
C15M
C16P
C16M
C17P
C17M
C18P
C18M
C19S
C19SP
C20P
1A1 88001
1B1 88002
1C1 88003
1D1 88004
1E1 88005
1F1 88006
1G1 88007
1H1 88008
1K1 88009
1L1 88010
1M1 88011
1N1 88012
1P1 88013
1A2 88014
1B2 88015
1C2 88016
88013K
1E2 88018
1F2 88019
1G2 88020
BKTF
1H2 88021
1K2 88022
1L2 88023
88022K
T12
2P3 88024
CTROR
ALTST
2K6 88101
2L6 88102
2M6 88103
LTRST
2A6 88104
2B6 88105
2C6 88106
ALTSTA
LTRSTA
HNDPPS
2H5 88112
ALSET
2K5 88113
2A2 88114
2B2 88115
2C2 88116
RPTAL
11P
F14A
2A3 88120
2B3 88121
F14B
2C3 88122
NRPTAL
11P
2C4 88128
2B4 88129
2D4 88130
TCAL
T03
TC0
2A4 88127
2B5 88134
2C5 88135
2D5 88136
NTCAL
2K2 88142
2H2 88143
2L2 88144
CTRAL
INKL
2G2 88141
PALE
2H1 88108
MPAL
EVNF
ODFBR
2D1 88107
2C1 88109
2B1 88110
2A1 88111
PLDS
2D2 88117
2E2 88118
2F2 88119
MRPTAL
2F3 88125
2G3 88126
RPTLDS
2D3 88123
2E3 88124
2E4 88131
2F4 88132
2G4 88133
MTCAL
2H4 88139
2K4 88140
TCLDS
2E5 88137
2F5 88138
2M2 88145
2P2 88147
MCTRAL
2N2 88146
2L3 88148
2K3 88149
CTRLDS
NCTRAL
2M3 88150
2N3 88151
PALE
XXX2AL
XXX3AL
RPTAL
NRPTAL
TCAL
NTCAL
CTRAL
NCTRAL
2F6 88751
2E6 88752
2G6 88753
2H6 88754
ALGA

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO. ← DENOTES AGC 5 PIN NO.
4. 1A3 88502 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2			
C3			
C4			

REFERENCE



+3VDC B POWER IN
+3VDC TO GATE
C1
C2
0VDC
+3VDC B POWER IN
+3VDC TO GATE
C3
C4
0VDC

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN D Sullivan DATE 28Aug63
CHECKED
APPROVAL W.B. Turner 9/10/63
APPROVAL Eldon C. Hall 12Sep63
NASA APPROVAL 31 Oct 63
MIT APPROVAL 12 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "V"
LOGIC MODULE NO. A29

CODE IDENT NO
SIZE E
NASA DRAWING NO. 1006559
SCALE —
WT
SHEET 1 OF 1

1006559

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

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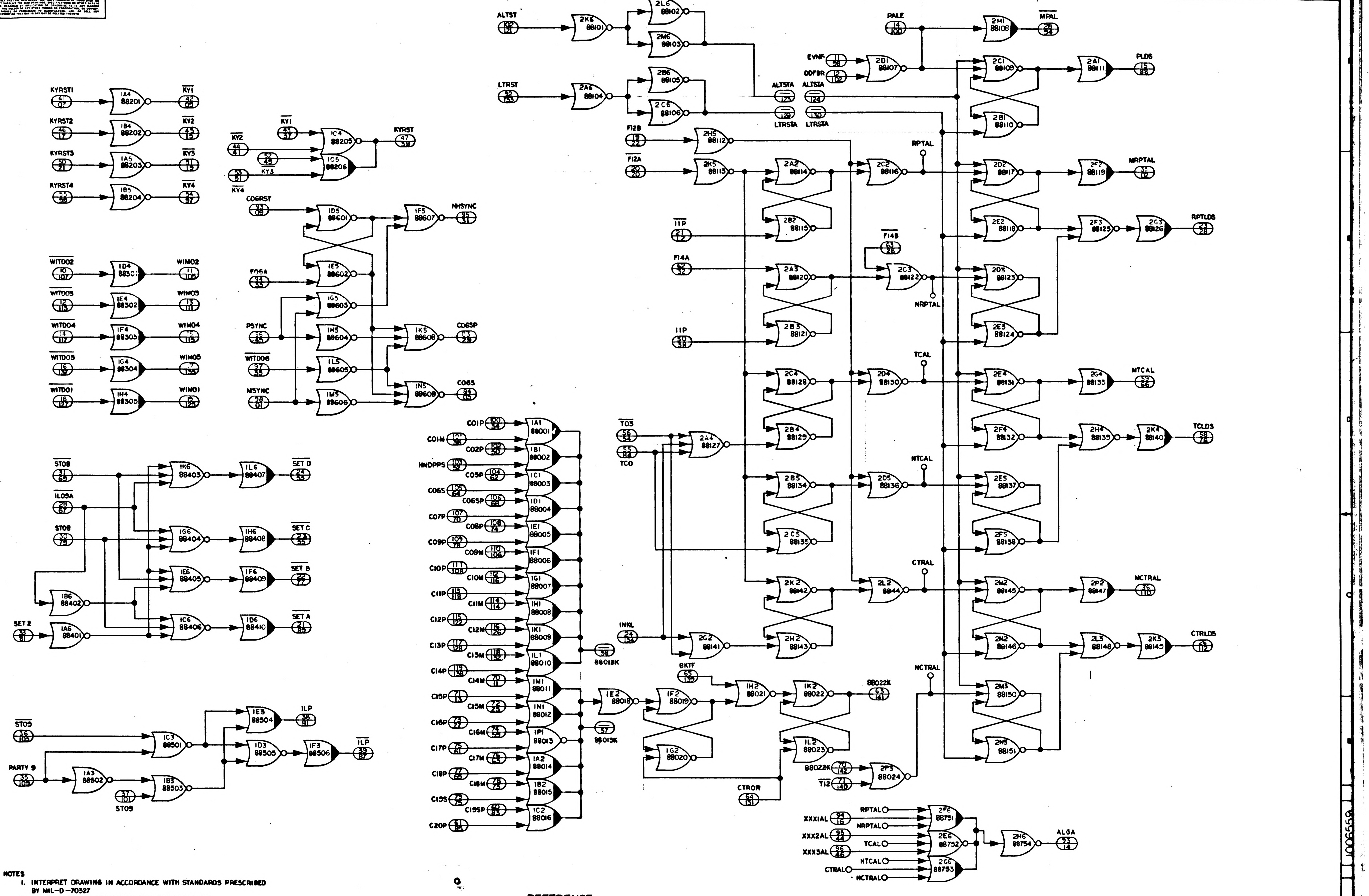
SYM	DESCRIPTION	DATE	APPROVAL

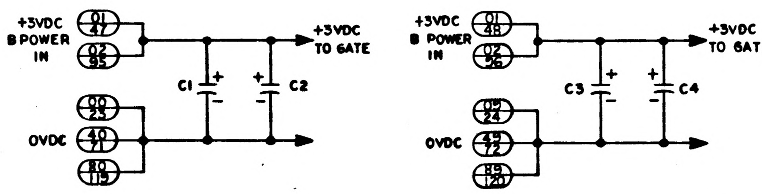
REVISIONS



ALTST
LTRST
KYRST1
KYRST2
KYRST3
KYRST4
KY1
KY2
KY3
KY4
KYRST
C06RST
NHSYNC
F05A
PSYNC
MSYNC
WITD06
C06SP
C06S
WITD02
WITD03
WITD04
WITD05
WITD01
WIM02
WIM03
WIM04
WIM05
WIM01
ST08
IL09A
SET D
SET C
SET B
SET A
SET 2
ST09
PARTY 9
ILP
C01P
C01M
C02P
HNDPPS
C05P
C06SP
C07P
C08P
C09P
C09M
C10P
C10M
C11P
C11M
C12P
C12M
C13P
C13M
C14P
C14M
C15P
C15M
C16P
C16M
C17P
C17M
C18P
C18M
C19S
C19SP
C20P
88013K
INKL
BKTF
88022K
CTROR
T12
T03
TC0
F12B
F12A
I1P
F14A
F14B
PALE
MPAL
EVNF
ODFBR
ALTSTA
LTRSTA
PLDS
RPTAL
MRPTAL
RPTLDS
NRPTAL
TCAL
MTCAL
TCLDS
NTCAL
CTRAL
MCTRAL
CTRLDS
NCTRAL
XXX1AL
XXX2AL
XXX3AL
ALGA

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO.
← DENOTES AGC 5 PIN NO.
4. IA3 88502 ← DENOTES AGC 4 CIRCUIT NO.
← DENOTES AGC 5 CIRCUIT NO.

REFERENCE



+3VDC B POWER IN
01 47
02 85
+3VDC TO GATE
C1
C2
OVDC
00 24
40 71
80 115
+3VDC B POWER IN
01 48
02 86
+3VDC TO GATE
C3
C4
OVDC
03 24
43 72
89 120

REF DES	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO.
CONTRACT
DRAWN DATE 22 Aug 63
CHECKED
APPROVAL W.B. Turner 9/10/63
APPROVAL 12 Aug 63
NASA APPROVAL
MIT APPROVAL 12 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

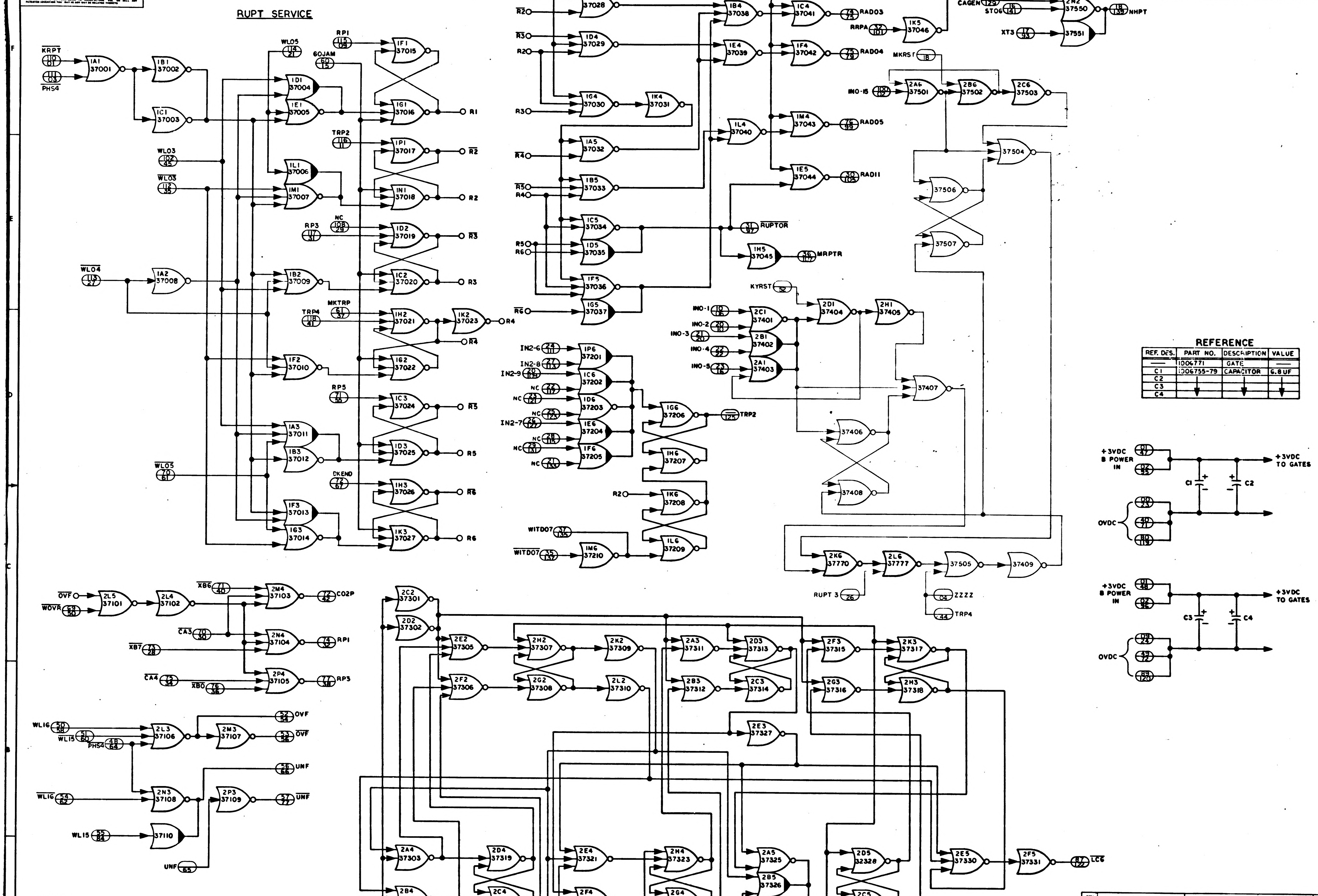
LOGIC FLOW "V"
LOGIC MODULE NO. A29

CODE IDENT NO.
SIZE E
NASA DRAWING NO. 1006559
SCALE —
WT
SHEET 1 OF 1

1006559

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.


RUPT SERVICE
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PHS4
WL05
WL03
WL04
RP1
60JAM
TRP2
RP3
NC
TRP4
MKTRP
RP5
DKEND
R1
R2
R3
R4
R5
R6
RUPTOR
MRPTR
RAD03
RAD04
RAD05
RAD11
RRPA
CAGEN
STO6
XT3
NHPT
MKRST
IN0-15
KYRST
IN0-1
IN0-2
IN0-3
IN0-4
IN0-5
IN2-6
IN2-8
IN2-9
IN2-7
WITD07
RUPT 3
ZZZZ
TRP4
OVF
WOVR
XB6
CA3
XB7
CA4
XB0
C02P
RP1
RP3
WL16
WL15
PHS4
UNF
CTR
T03
INKL
MPI
LC6
+3VDC B POWER IN
+3VDC TO GATES
OVDC
C1
C2
C3
C4
MASTER

REFERENCE

REF. DES.	PART NO.	DESCRIPTION	VALUE
—	1006771	GATE	—
C1	1006755-79	CAPACITOR	6.8 UF
C2	↓	↓	↓
C3	↓	↓	↓
C4	↓	↓	↓

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. SEE DRAWING NO. 1006013 FOR LOGIC DESIGN CRITERIA
3. ⊖ ← DENOTES AGC 4 PIN NO. ← DENOTES AGC 5 PIN NO.
4. 2M5 37090 ← DENOTES AGC 4 CIRCUIT NO. ← DENOTES AGC 5 CIRCUIT NO.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAWN J. Simpson DATE 9 Jul 65
CHECKED CW 9 Jul 65
APPROVAL
APPROVAL R Alonso
NASA APPROVAL
MIT APPROVAL WK 1 Jul 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC FLOW "L"
MODULE NO. A37

CODE IDENT NO. 80230 SIZE E NASA DRAWING NO. 1006560
SCALE — WT — SHEET 1 OF 1

1006560

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

WIRELIST IS AN ALPHABETICAL ORDERING OF ALL SIGNAL NAMES APPEARING ON TERMINALS OF THE AGC-4 ENDPLATE

SAMPLE PRINTOUT

```
SIGNAL       STICK          PIN
NAME       NO.  HALF      NUMBER      LOAD

RAG1       15    1         100          4
           16    1         100          4
            2    1          31        -32      NET LOAD:  -24
RBG1        1    1         109          4
            1    2         109          4      NET LOAD:    8
```

DEFINITION OF STICK NUMBERS

STICK NUMBER	INTERPRETATION	
1	NASA DWG. NO. 1006511	BIT STICK 1
2	NASA DWG. NO. 1006511	BIT STICK 2
3	NASA DWG. NO. 1006511	BIT STICK 3
4	NASA DWG. NO. 1006511	BIT STICK 4
5	NASA DWG. NO. 1006511	BIT STICK 5
6	NASA DWG. NO. 1006511	BIT STICK 6
7	NASA DWG. NO. 1006511	BIT STICK 7
8	NASA DWG. NO. 1006511	BIT STICK 8
9	NASA DWG. NO. 1006511	BIT STICK 9
10	NASA DWG. NO. 1006511	BIT STICK 10
11	NASA DWG. NO. 1006511	BIT STICK 11
12	NASA DWG. NO. 1006511	BIT STICK 12
13	NASA DWG. NO. 1006511	BIT STICK 13
14	NASA DWG. NO. 1006511	BIT STICK 14
15	NASA DWG. NO. 1006511	BIT STICK 15
16	NASA DWG. NO. 1006511	BIT STICK 16
17	NASA DWG. NO. 1006513	
18	NASA DWG. NO. 1006515	
19	NASA DWG. NO. 1006516	
20	NASA DWG. NO. 1006512	
21	NASA DWG. NO. 1006514	
22	NASA DWG. NO. 1006517	
23	NASA DWG. NO. 1006518	
24	NASA DWG. NO. 1006518	
25	NASA DWG. NO. 1006519	
26	NASA DWG. NO. 1006519	
27	NASA DWG. NO. 1006523	
28	NASA DWG. NO. 1006526	
29	NASA DWG. NO. 1006522	
30	NASA DWG. NO. 1006525	
31	NASA DWG. NO. 1006524	
32	NASA DWG. NO. 1006530	
33	NASA DWG. NO. 1006527	
34	NASA DWG. NO. 1006528	
35	NASA DWG. NO. 1006529	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00515 DATE 6 Mar 63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN ______ DATE ______
CHECKED H. Fisher 3/6/63
APPROVAL Robert F Morse 3/6/63
APPROVAL Eldon C Hall 3/6/63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AGC-4 ENDPLATE WIRELIST
(DELPHI SYSTEM)

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006601
SCALE | WT | SHEET 1 OF 1

MASTER

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1006601

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED PER TDRR 00895	4-17-63	ECH	WK
B	REPLACED BY REV C WITH CHANGES PER TDRR 03836	12-10-63	R.J.B.	WK

WIRELIST IS AN ALPHABETICAL ORDERING OF ALL SIGNAL NAMES APPEARING ON TERMINALS OF THE AGC-4 ENDPLATE

SAMPLE PRINTOUT

```
SIGNAL       STICK         PIN
NAME       NO.   HALF     NUMBER      LOAD

RAG1        15     1        100          4
            16     1        100          4
             2     1         31        -32      NET LOAD:  -24
RBG1         1     1        109          4
             1     2        109          4      NET LOAD:    8
```

DEFINITION OF STICK NUMBERS

STICK NUMBER	INTERPRETATION	
1	NASA DWG. NO. 1006511	BIT STICK 1
2	NASA DWG. NO. 1006511	BIT STICK 2
3	NASA DWG. NO. 1006511	BIT STICK 3
4	NASA DWG. NO. 1006511	BIT STICK 4
5	NASA DWG. NO. 1006511	BIT STICK 5
6	NASA DWG. NO. 1006511	BIT STICK 6
7	NASA DWG. NO. 1006511	BIT STICK 7
8	NASA DWG. NO. 1006511	BIT STICK 8
9	NASA DWG. NO. 1006511	BIT STICK 9
10	NASA DWG. NO. 1006511	BIT STICK 10
11	NASA DWG. NO. 1006511	BIT STICK 11
12	NASA DWG. NO. 1006511	BIT STICK 12
13	NASA DWG. NO. 1006511	BIT STICK 13
14	NASA DWG. NO. 1006511	BIT STICK 14
15	NASA DWG. NO. 1006511	BIT STICK 15
16	NASA DWG. NO. 1006511	BIT STICK 16
17	NASA DWG. NO. 1006513	
18	NASA DWG. NO. 1006515	
19	NASA DWG. NO. 1006516	
20	NASA DWG. NO. 1006512	
21	NASA DWG. NO. 1006514	
22	NASA DWG. NO. 1006517	
23	NASA DWG. NO. 1006518	
24	NASA DWG. NO. 1006518	
25	NASA DWG. NO. 1006519	
26	NASA DWG. NO. 1006519	
27	NASA DWG. NO. 1006523	
28	NASA DWG. NO. 1006526	
29	NASA DWG. NO. 1006522	
30	NASA DWG. NO. 1006525	
31	NASA DWG. NO. 1006524	
32	NASA DWG. NO. 1006530	
33	NASA DWG. NO. 1006527	
34	NASA DWG. NO. 1006528	
35	NASA DWG. NO. 1006529	
36	NASA DWG. NO. 1006533	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00515 DATE 6 Mar 63

Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN ______ DATE ______
CHECKED H. [illegible] 3/6/63
APPROVAL Robert F Morse 3/6/63
APPROVAL Eldon C Hall 3/6/63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AGC-4 ENDPLATE WIRELIST
(DELPHI SYSTEM)

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006601
SCALE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006601

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 03836	7-30-63 10-10-63	BB WK

WIRELIST IS AN ALPHABETICAL ORDERING OF ALL SIGNAL NAMES APPEARING ON TERMINALS OF THE AGC-4 ENDPLATE

SAMPLE PRINTOUT

```
SIGNAL      STICK         PIN
NAME      NO.  HALF     NUMBER      LOAD

RAG1       15    1        100          4
           16    1        100          4
            2    1         31        -32      NET LOAD:  -24

RBG1        1    1        109          4
            1    2        109          4      NET LOAD:    8
```

DEFINITION OF STICK NUMBERS

STICK NUMBER	SCHEMATIC DRAWING	
1	NASA DWG. NO. 1006540	BIT STICK 1
2	NASA DWG. NO. 1006540	BIT STICK 2
3	NASA DWG. NO. 1006540	BIT STICK 3
4	NASA DWG. NO. 1006540	BIT STICK 4
5	NASA DWG. NO. 1006540	BIT STICK 5
6	NASA DWG. NO. 1006540	BIT STICK 6
7	NASA DWG. NO. 1006540	BIT STICK 7
8	NASA DWG. NO. 1006540	BIT STICK 8
9	NASA DWG. NO. 1006540	BIT STICK 9
10	NASA DWG. NO. 1006540	BIT STICK 10
11	NASA DWG. NO. 1006540	BIT STICK 11
12	NASA DWG. NO. 1006540	BIT STICK 12
13	NASA DWG. NO. 1006540	BIT STICK 13
14	NASA DWG. NO. 1006540	BIT STICK 14
15	NASA DWG. NO. 1006540	BIT STICK 15
16	NASA DWG. NO. 1006540	BIT STICK 16
17	NASA DWG. NO. 1006541	
18	NASA DWG. NO. 1006542	
19	NASA DWG. NO. 1006543	
20	NASA DWG. NO. 1006544	
21	NASA DWG. NO. 1006545	
22	NASA DWG. NO. 1006546	
23	NASA DWG. NO. 1006547	
24	NASA DWG. NO. 1006547	
25	NASA DWG. NO. 1006548	
26	NASA DWG. NO. 1006548	
27	NASA DWG. NO. 1006549	
28	NASA DWG. NO. 1006550	
29	NASA DWG. NO. 1006551	
30	NASA DWG. NO. 1006552	
31	NASA DWG. NO. 1006553	
32	NASA DWG. NO. 1006554	

STICK NUMBER	SCHEMATIC DRAWING
33	NASA DWG. NO. 1006555
34	NASA DWG. NO. 1006556
35	NASA DWG. NO. 1006557
36	NASA DWG. NO. 1006559
37	NASA DWG. NO. 1006119
38	NASA DWG. NO. 1006119
50	NASA DWG. NO. 1006061
51	NASA DWG. NO. 1006074
52	NASA DWG. NO. 1006082
53	NASA DWG. NO. 1006118
54	NASA DWG. NO. 1006118
55	NASA DWG. NO. 1006084
56	NASA DWG. NO. 1006084
57	NASA DWG. NO. 1006099
58	NASA DWG. NO. 1006086
59	NASA DWG. NO. 1006086
60	NASA DWG. NO. 1006091
61	NASA DWG. NO. 1006091
62	NASA DWG. NO. 1006091

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00515 DATE 6 MAR 63

Ⓒ REPLACES REV B WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN ________ DATE ______
CHECKED ________
APPROVAL ________
APPROVAL BF Moore 10/10/63
NASA APPROVAL
MIT APPROVAL WK for 10 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AGC-4 ENDPLATE WIRELIST
(DELPHI SYSTEM)

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006601
SCALE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED

NOTES:

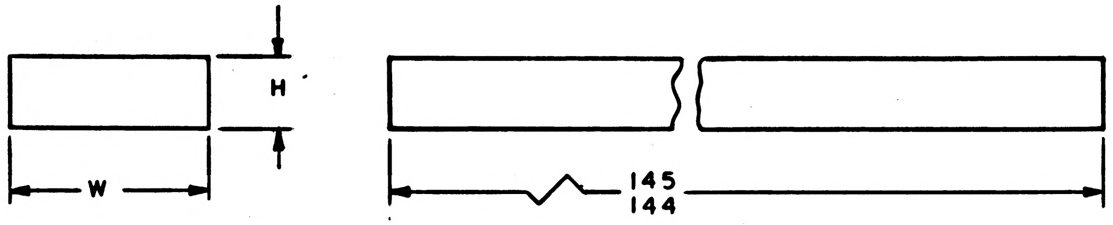
1. GENERAL REQUIREMENTS:
   - A. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

2. ACCEPTANCE AND INSPECTION:
   - A. DIMENSIONS: AS SPECIFIED HEREIN.
   - B. MATERIAL:
     - (1) 1006651-1:
       - (a) GASKET CORE AND MOUNTING FLANGE: BLACK CLOSED CELL NEOPRENE SPONGE RUBBER PER MIL-R-6130, TYPE II, GRADE A, CONDITION MEDIUM.
       - (b) GASKET SHIELDING: NICKEL-COPPER ALLOY (MONEL) PER QQ-N-281, CLASS A.
       - (c) GASKET MOUNTING FLANGE SHALL HAVE A PRESSURE SENSITIVE ADHESIVE WITH A PROTECTIVE BACKING ON SURFACE "A" INDICATED ON DRAWING.
     - (2) 1006651-2,-3:
       - (a) GASKET CORE: BLACK CLOSED CELL NEOPRENE SPONGE RUBBER PER ASTM-D-1056 GRADE SC-43.
       - (b) GASKET SHIELDING: NICKEL-COPPER ALLOY (MONEL) PER QQ-N-281, CLASS A.
   - C. MARKING: UNIT PACKAGES AND INTERMEDIATE AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE MANUFACTURER'S NAME, PART NUMBER, DATE OF MANUFACTURE AND LOT NUMBER.

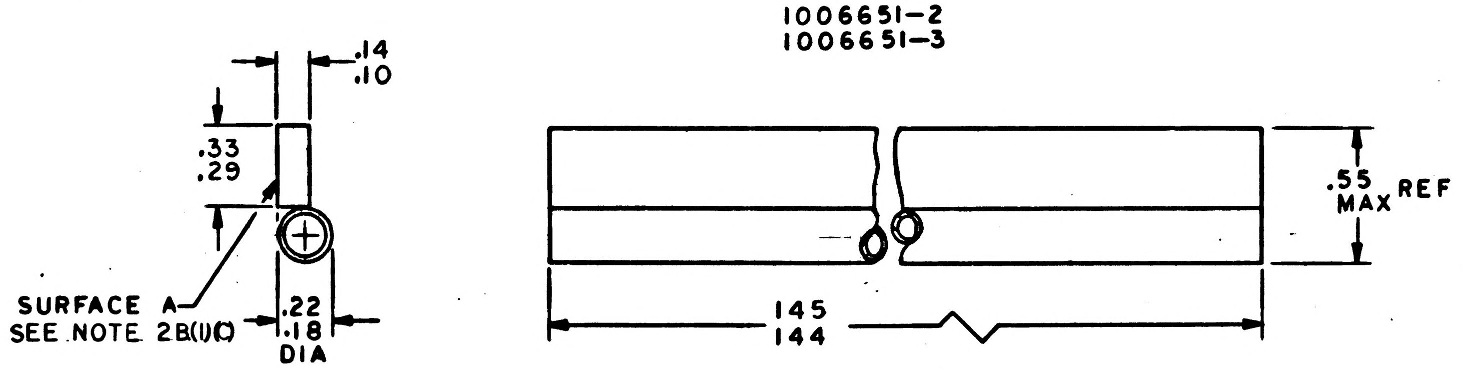
3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) INSERTION LOSS: 40 TO 60 DB.
     - (2) SHIELDING EFFECTIVENESS: 80 TO 110 DB.
   - B. CONSTRUCTION:
     - (1) 1006651-1: THE GASKET CORE SHALL HAVE A SINGLE COVER OF KNITTED MONEL.
     - (2) 1006651-2,-3: THE GASKET CORE SHALL HAVE A DOUBLE COVER OF KNITTED MONEL.

DASH NO.	DIMENSIONS W	DIMENSIONS H
-1	SEE DRAWING	
-2	.83 .70	.30 .23
-3	.24 .17	.18 .12

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04305 DATE 10/30/63



1006651-2
1006651-3



1006651-1

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crespi DATE 18 Oct 63
CHECKED J. Rozzi / H. Haydasi
APPROVAL R. J. Blackney JPK
APPROVAL
APPROVAL J. B. Dick
NASA APPROVAL 10/30/63
MIT APPROVAL 30 Oct 63
MIT APPROVAL 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SHIELDING GASKET, ELECTRONIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006651
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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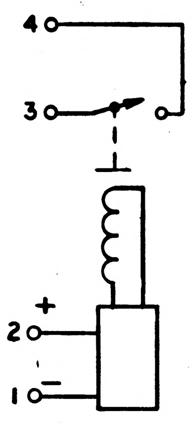
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

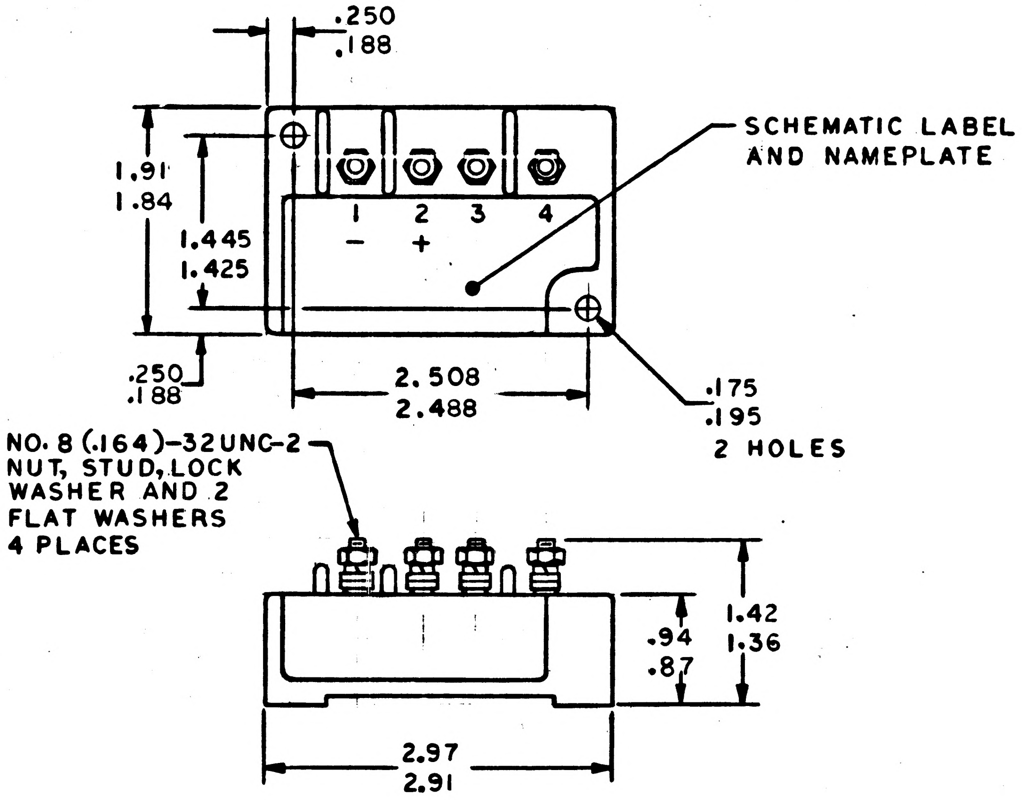
NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), TERMINAL IDENTITY AND POLARITY AND SCHEMATIC. PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODE AND THE NASA PART NUMBER.
   - B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. ELECTRICAL CHARACTERISTICS (OVER TEMP AND VOLTAGE RANGE)
     - (1) OPERATING INPUT VOLTAGE RANGE: 18 - 32 VDC.
     - (2) POWER CONSUMPTION: 1 WATT MAXIMUM.
     - (3) FLASHING RATE: 5 CYCLES PER SECOND ± 10%.
     - (4) ON/OFF RATIO: 1.0 ± 10%.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 1660 HOURS MINIMUM OVER THE TEMPERATURE AND VOLTAGE RANGE.
   - B. STORAGE LIFE: INDEFINITE, A POTTED UNIT.
   - C. CONSTRUCTION: MOLDED PLASTIC CASE WITH STUD TYPE TERMINALS WITH BARRIERS BETWEEN. COMPONENTS ARE POTTED IN PLACE. EACH STUD SHALL HAVE A NUT, LOCKWASHER, AND TWO PLAIN WASHERS SUPPLIED.
   - D. AMBIENT TEMPERATURE RANGE: -55°C TO +72°C.
   - E. CONTACT CURRENT RATING: 0.5 AMPERE INDUCTIVE OR LAMP LOAD.
   - F. RELAY CONTACT MATERIAL: ELECTROPLATED RHODIUM, HERMETICALLY SEALED IN A GLASS ENCLOSURE.
   - G. STUD MATERIAL: CADMIUM PLATED BRASS.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04305 DATE 10/30/63



SCHEMATIC


.250
.188
1.91
1.84
1.445
1.425
1
2
3
4
−
+
SCHEMATIC LABEL AND NAMEPLATE
.250
.188
2.508
2.488
.175
.195
2 HOLES
NO. 8 (.164)-32UNC-2 NUT, STUD, LOCK WASHER AND 2 FLAT WASHERS 4 PLACES
.94
.87
1.42
1.36
2.97
2.91

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
–

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN C. Coops DATE 23 Jul 63
CHECKED J. Ruggeri 10 Sept 63 H. Mayo
APPROVAL R. J. Blackney JPK
APPROVAL
APPROVAL J. G. Walsh 10/21/63
NASA APPROVAL 10/30/63
MIT APPROVAL W. 30 Oct 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLASHER, ELECTRONIC, RELAY TYPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006652
SCALE 1 / 1
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03429	9/26/63	JW
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16749 DR R Dubois CHK APPD A. Maynard	4/1/65	KSS

REQUIREMENTS:

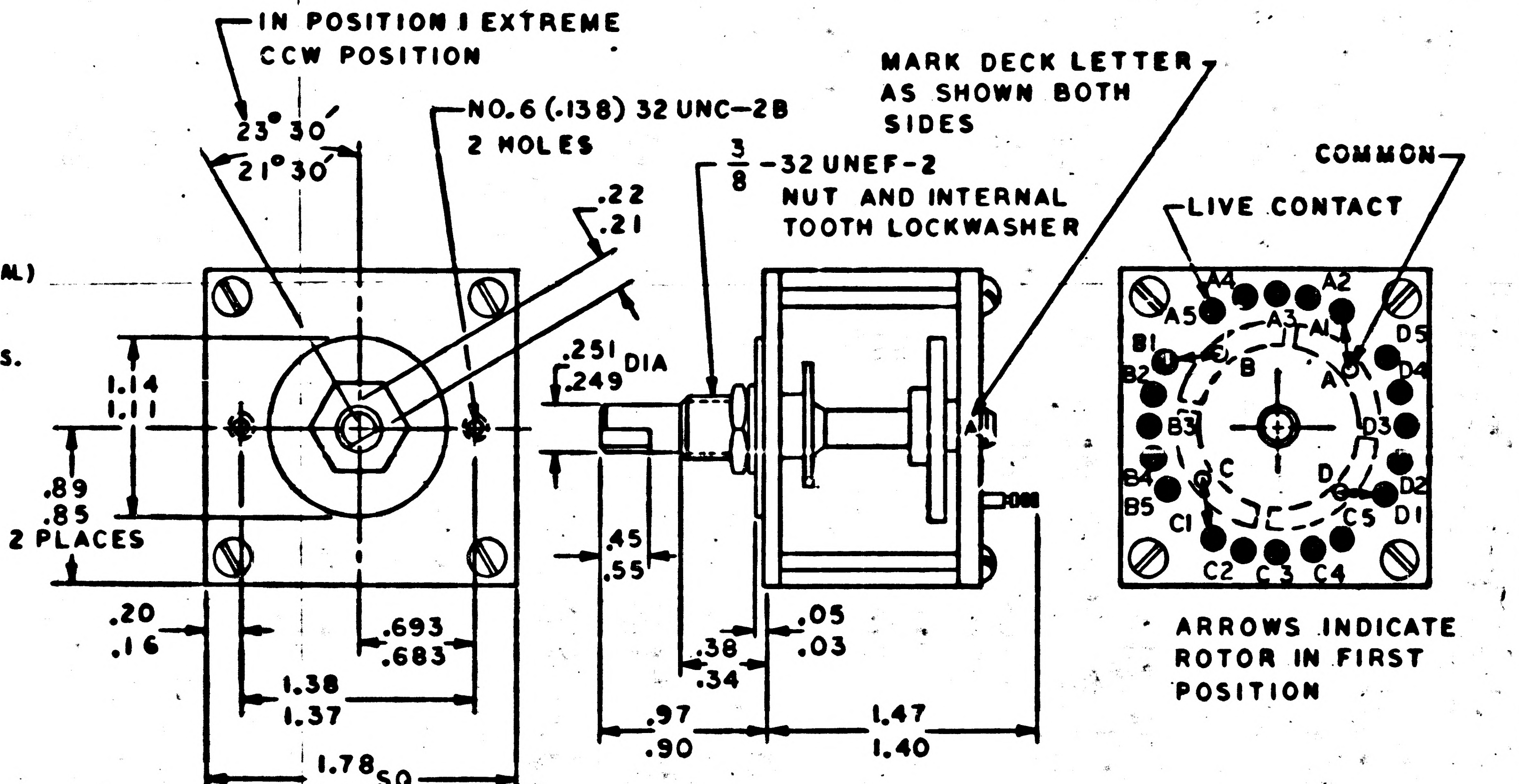
1. GENERAL:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. SUPPLIER SHALL CONFORM TO MIL-Q-9858. ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS B.
   - C. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, TERMINAL IDENTIFICATION AND DECK NUMBER. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
   - D. PREPARATION FOR DELIVERY PER ND 1002215.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
     - (2) SHALL BE A 4 POLE, 1 DECK, 5 POSITION, ADJUSTABLE STOPS, 15° INDEX, SHORTING TYPE.
     - (3) WIPER BLADES: SHALL BE MULTILEAF TYPE.
     - (4) SWITCHING TORQUE: 20 TO 80 INCH OUNCES.
     - (5) TERMINALS: SHALL ACCOMMODATE TWO (2) #20 AWG STRANDED CONDUCTORS.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAXIMUM INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
     - (2) CAPACITANCE: CONTACT-CONTACT, CONTACT-SLIPRING - 2.5 PICOFARADS.
     - (3) DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND ALSO BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.

       SEA LEVEL - 1500 VOLTS RMS
       70,000 FT - 450 VOLTS RMS
     - (4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC APPLIED AS SPECIFIED IN PARA 2. B. (3).
   - C. A CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:
   - A. TERMINAL BOARD MATERIAL: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - B. PANEL MATERIAL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - C. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - D. CURRENT RATING, CONTINUOUS (NO BREAKING): 10 AMPERES RMS MAXIMUM.
   - E. CONTACT AREAS SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN C. Camp DATE 6-63
CHECKED J. Rug 12 Aug 63 Maynard
APPROVAL C. JPK
APPROVAL 9/26/63
APPROVAL 9/4/63
NASA APPROVAL 9/4/63
MIT APPROVAL 9/24/63
MIT APPROVAL 9/25/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
5 POSITIONS / POLE, 4 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006653
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03429	9/26/63	

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, TERMINAL IDENTIFICATION AND DECK NUMBER. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03429 DATE 26 Sep 63

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

(2) SHALL BE A 4 POLE, 1 DECK, 5 POSITION, ADJUSTABLE STOPS, 15° INDEX, SHORTING TYPE.

(3) WIPER BLADES: SHALL BE MULTILEAF TYPE.

(4) SWITCHING TORQUE: 20 TO 80 INCH OUNCES.

(5) TERMINALS: SHALL ACCOMMODATE TWO (2) #20 AWG STRANDED CONDUCTORS.

B. ELECTRICAL CHARACTERISTICS:

(1) CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAXIMUM INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.

(2) CAPACITANCE: CONTACT-CONTACT, CONTACT-SLIPRING - 2.5 PICOFARADS.

(3) DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND ALSO BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.

SEA LEVEL - 1500 VOLTS RMS
70,000 FT - 450 VOLTS RMS

(4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC APPLIED AS SPECIFIED IN PARA 2. B. (3).

C. A CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. TERMINAL BOARD MATERIAL: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.

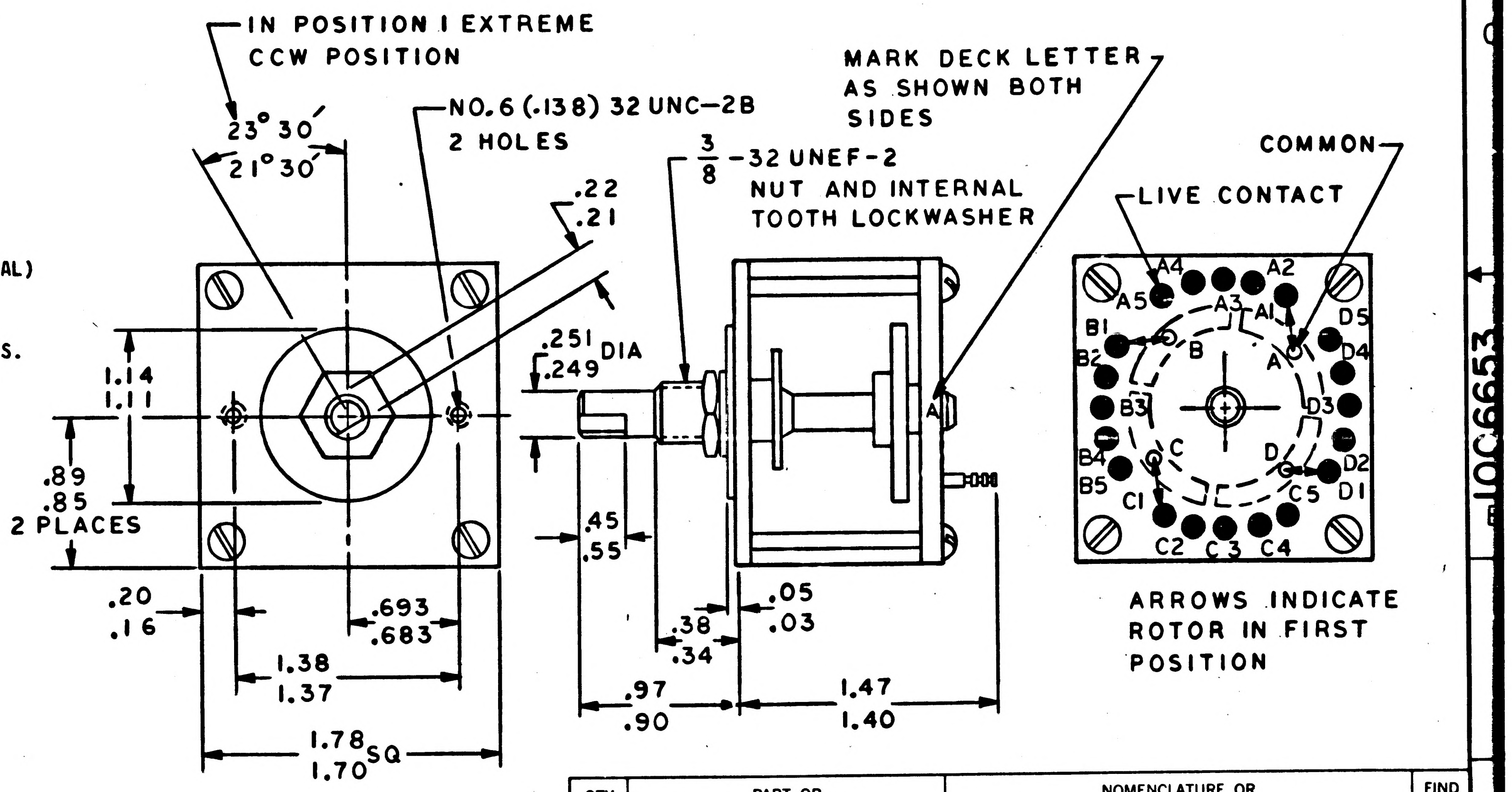
B. PANEL MATERIAL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.

C. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.

D. CURRENT RATING, CONTINUOUS (NO BREAKING): 10 AMPERES RMS MAXIMUM.

E. CONTACT AREAS SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN C. Crespi DATE 4 Sep 63
CHECKED J. Ruggeri 12 Sept 63 H. Harpell
APPROVAL C. Sperling JPK
APPROVAL 9/12/63
APPROVAL 9/12/63
NASA APPROVAL 9/24/63
MIT APPROVAL 9/24/63
MIT APPROVAL 9/25/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
5 POSITIONS / POLE, 4 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006653
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006653

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

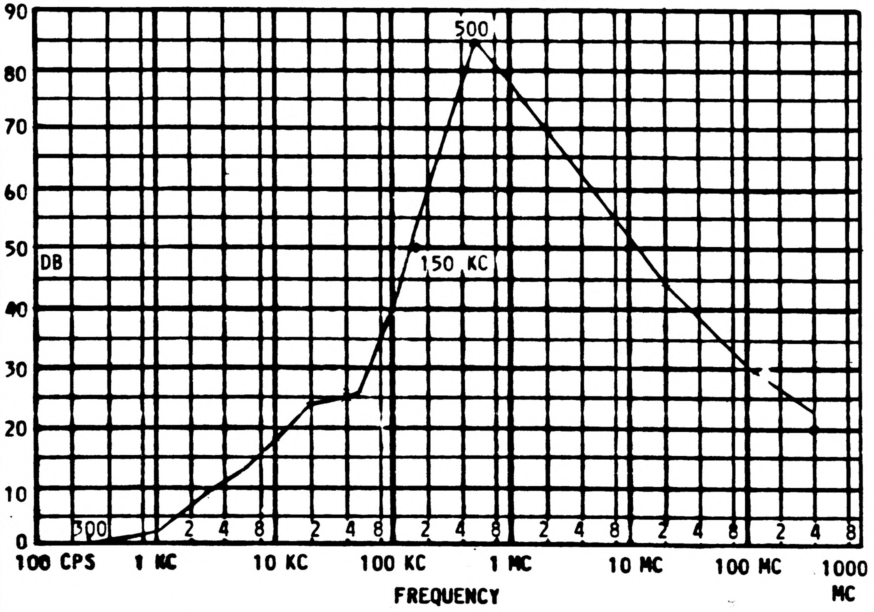
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04136	10/24/63	
A	REVISED PER TDRR 07856 DR R. Wheeler CHK Walkowicz APPD A. Maynard	5/6/64	KEB

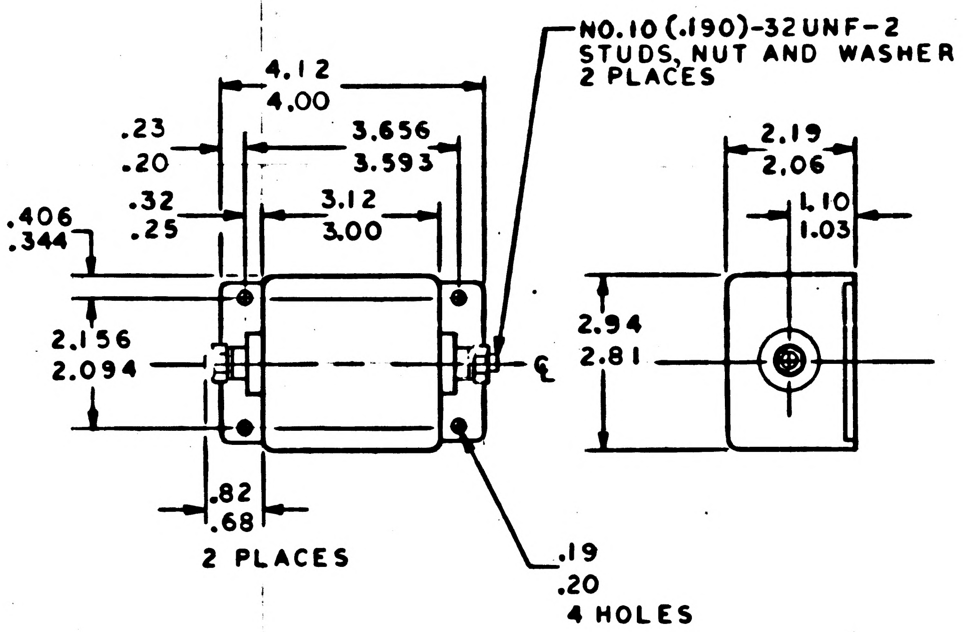
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-F-15733 AND THE SPECIFIC CHARACTERISTICS BELOW, EXCEPT THAT B AND C TESTS PER MIL-F-15733 SHALL NOT BE REQUIRED.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODE AND THE NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. ELECTRICAL CHARACTERISTICS:
     - (1) INSERTION - LOSS CHARACTERISTIC: SEE FIGURE 1 (REFERENCE)
       TEST POINTS
       0.15 MC, LOSS SHALL BE 55 DB MINIMUM
       10.0 MC, LOSS SHALL BE 50 DB MINIMUM
       400.0 MC, LOSS SHALL BE 20 DB MINIMUM
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: SHALL BE CAPABLE OF 2000 HOURS MINIMUM OPERATION AT MAXIMUM RATED CURRENT AND TEMPERATURE.
   - B. STORAGE LIFE: INDEFINITE, HERMETICALLY SEALED UNIT.
   - C. ELECTRICAL RATINGS:
     - (1) CURRENT AND VOLTAGE: 25 AMPERES AT 600 VDC OR 250 VRMS, 0 TO 70 CPS.
     - (2) VOLTAGE DROP: SHALL NOT EXCEED 0.5 VOLTS AT FULL RATED CURRENT.
   - D. TEMPERATURE RISE: SHALL NOT EXCEED 25°C.
   - E. AMBIENT TEMPERATURE RANGE (OPERATING): -55°C TO +85°C.
   - F. FINISH: HOT TIN DIPPED.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04136 DATE 10/24/63

FIGURE 1 - INSERTION LOSS





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT
FINAL FINISH: SEE NOTE

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 30 July 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL
APPROVAL 10/14/63
NASA APPROVAL 10-24-63
MIT APPROVAL W. Kupfer 24 Oct 63
MIT APPROVAL Dennis M. 22 Oct 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FILTER, RADIO INTERFERENCE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006654
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04136	10/24/63	

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION. THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER: AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-F-15733 AND THE SPECIFIC CHARACTERISTICS BELOW.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODE AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. ELECTRICAL CHARACTERISTICS:
     - (1) INSERTION - LOSS CHARACTERISTIC: SEE FIGURE 1 (REFERENCE)
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       10.0 MC, LOSS SHALL BE 50 DB MINIMUM
       400.0 MC, LOSS SHALL BE 20 DB MINIMUM

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: SHALL BE CAPABLE OF 2000 HOURS MINIMUM OPERATION AT MAXIMUM RATED CURRENT AND TEMPERATURE.
   - B. STORAGE LIFE: INDEFINITE, HERMETICALLY SEALED UNIT.
   - C. ELECTRICAL RATINGS:
     - (1) CURRENT AND VOLTAGE: 25 AMPERES AT 600 VDC OR 250 VRMS, 0 TO 70 CPS.
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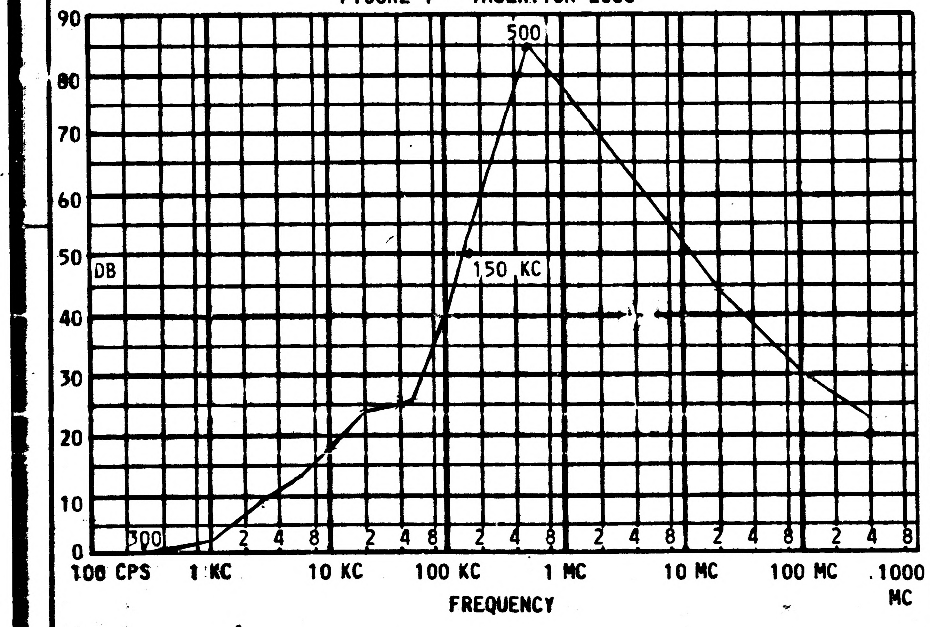
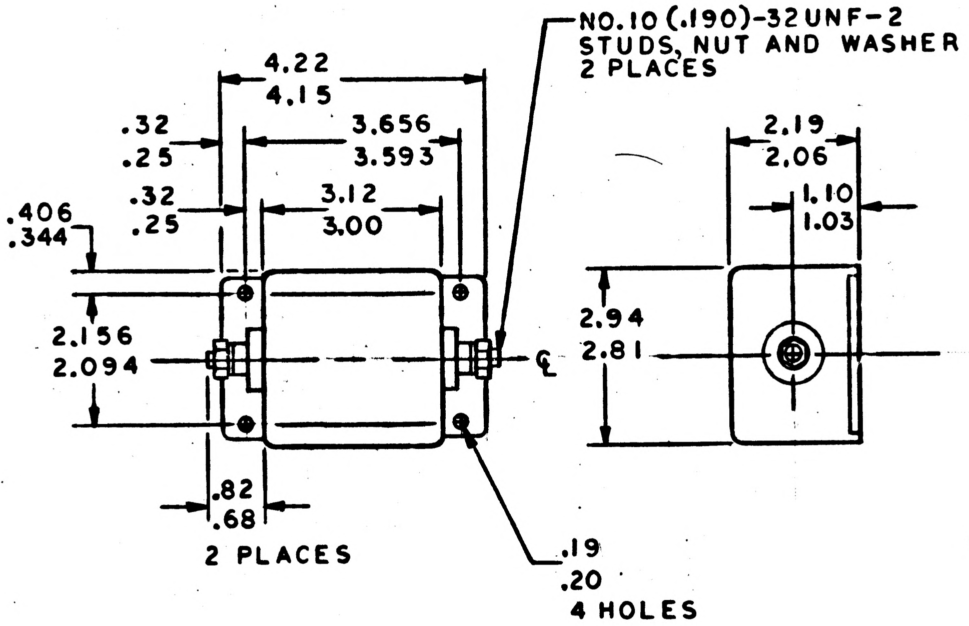
   - D. TEMPERATURE RISE: SHALL NOT EXCEED 25°C.
   - E. AMBIENT TEMPERATURE RANGE (OPERATING): -55°C TO +85°C.
   - F. FINISH: HOT TIN DIPPED.

FIGURE 1 - INSERTION LOSS



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04136 DATE 10/24/63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Cooper DATE 30 Jul 63
CHECKED J. Ruggeri 13 Jan 63
APPROVAL C. Sparling
APPROVAL
APPROVAL 10/14/63
NASA APPROVAL 10/24/63
MIT APPROVAL 24 Oct 63
MIT APPROVAL Dennis M. Scolamiero 22 Oct 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FILTER, RADIO INTERFERENCE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006654
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006654

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 0342F	9/26/63	
A	CLASS II CHANGE PER RD-R5557A DR S. Orifice CHK J. Ruggiero APPD W Maynard	12/11/63	JJS
B	REVISION LETTER CHANGED PER TDRR 10467 DR S.J. Orifice CHK APPD H. Maynard	7/8/64	

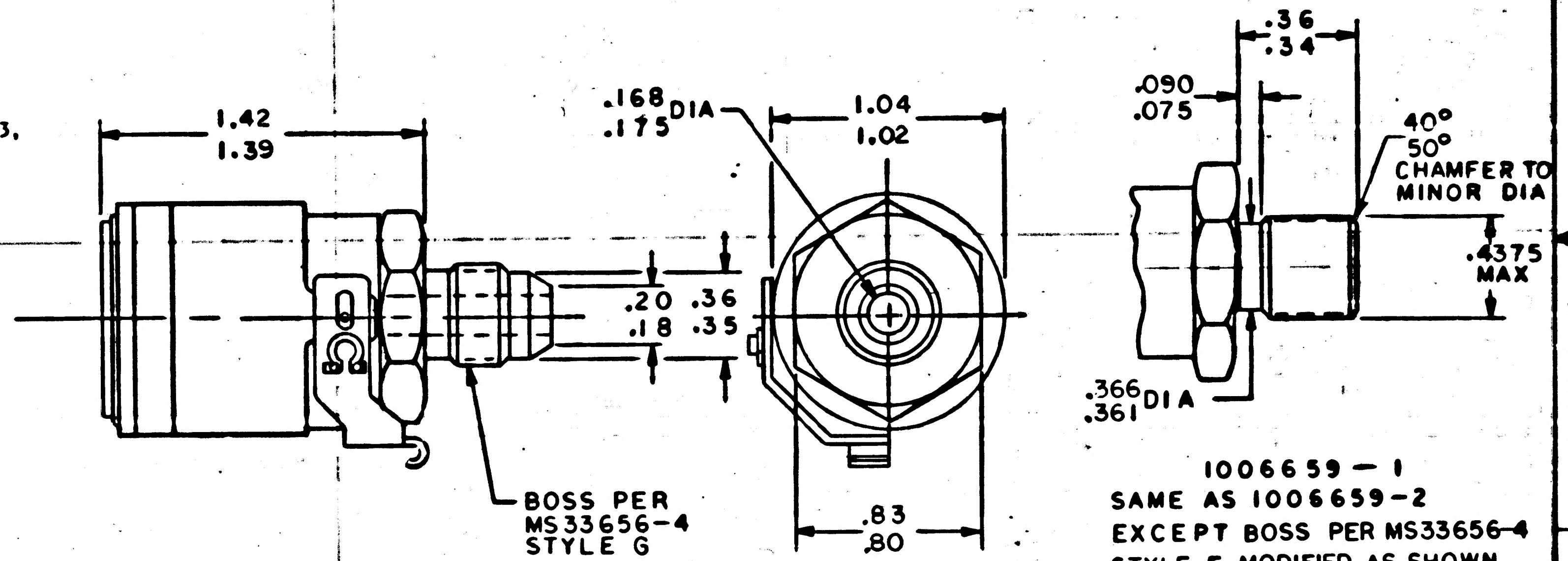
REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY OF PARTS ENCLOSED.
   - C. PROOF PRESSURE [illegible]

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
   - B. A CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL ACCOMPANY EACH SHIPMENT.
   - C. PROOF PRESSURE: 170 PSI MINIMUM (100 PERCENT INSPECTION).

3. DESIGN:
   - A. MATERIAL: CORROSION-RESISTANT STEEL IN ACCORDANCE WITH QQ-S-763, CLASS 303, CONDITION A.
   - B. FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072, METHOD E300.
   - C. UNIT SHALL BE CAPABLE OF USE WITH A FLUID MIXTURE OF:
     - ETHYLENE GLYCOL
     - WATER, TRIPLE DISTILLED
     - TRIETHANOLAMINEPHOSPHATE
     - SODIUMMERCAPTOBENZOTHIOZOLE
   - D. BURST PRESSURE: 300 PSI MINIMUM.
   - E. AIR INCLUSION: 0.002 IN^3 MAX.
   - F. OPERATING PRESSURE: 85 PSI MINIMUM.
   - G. SPILLAGE: 0.2 DROP MAXIMUM.
   - H. PRESSURE DROP: 2.5 PSI MAXIMUM.
   - J. FLOW: 1 GPM.
   - K. AIR INCLUSION: 0.002 IN^3 MAX.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 0342F DATE 26 Sep 63



1006659-1
SAME AS 1006659-2
EXCEPT BOSS PER MS33656-4
STYLE E MODIFIED AS SHOWN

1006659-2
AS SHOWN

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J.D.C. Caspi DATE 24 Aug 63
CHECKED J. Ruggiero H. Maynard
APPROVAL H. Winsor
APPROVAL
APPROVAL 9-11-63
NASA APPROVAL 9/26/63
MIT APPROVAL
MIT APPROVAL 9/26/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUPLING HALF,
QUICK DISCONNECT, FEMALE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006659
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 0342F	9/26/63	
A	CLASS II CHANGE PER RD-R5557A DR J. Onfield CHK J. Ruggerio APPD W. Maynard	12/11/63	JJS
B	REVISION LETTER CHANGED PER TDRR 10467 DR S.J. Orifice CHK APPD H. Maynard	7/8/64	JB
C	REVISED PER TDRR 14629 DR J.P. Leonard CHK J.C.J APPD D.M. Sleeper	1/18/65	KB

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

   B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY OF PARTS ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: SEE SKETCH.

   B. A CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL ACCOMPANY EACH SHIPMENT.

   C. PROOF PRESSURE: 170 PSI MINIMUM (100 PERCENT INSPECTION).

3. DESIGN:

   A. MATERIAL: CORROSION-RESISTANT STEEL IN ACCORDANCE WITH QQ-S-763, CLASS 303, CONDITION A.

   B. FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072, METHOD E300.

   C. UNIT SHALL BE CAPABLE OF USE WITH A FLUID MIXTURE OF:

      ETHYLENE GLYCOL
      WATER, TRIPLE DISTILLED
      TRIETHANOLAMINEPHOSPHATE
      SODIUMMERCAPTOBENZOTHIOZOLE

   D. BURST PRESSURE: 300 PSI MINIMUM.

   E. AIR INCLUSION: 0.002 IN^3 MAX.

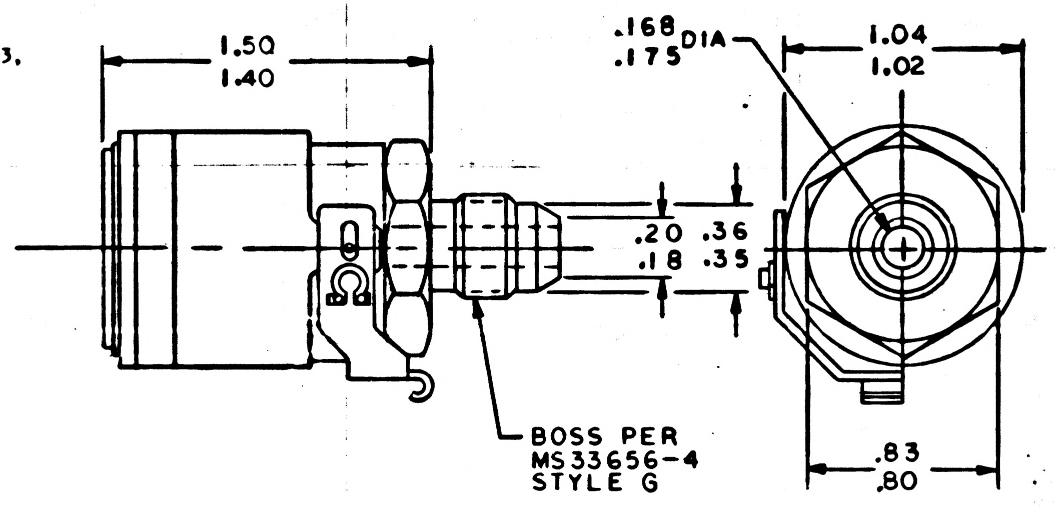
   F. OPERATING PRESSURE: 85 PSI MINIMUM.

   G. SPILLAGE: 0.2 DROP MAXIMUM.

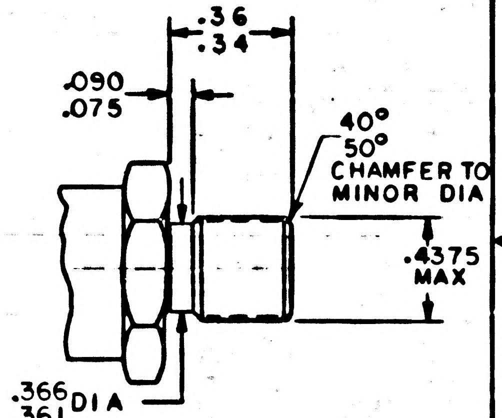
   H. PRESSURE DROP: 2.5 PSI MAXIMUM.

   J. FLOW: 1 GPM.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 0342F DATE 26 Sep 63



1006659 — 2
AS SHOWN



1006659 — 1
SAME AS 1006659—2
EXCEPT BOSS PER MS33656-4
STYLE E MODIFIED AS SHOWN

1006659

PROCURE FROM:

SEATON WILSON MFG. CO., INC.
911-919 N. VICTORY BLVD
BURBANK, CALIF.
PART NO. Z-603LSS-4

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS. 9-498
DRAWN J.C. Campi DATE
CHECKED J. Ruggerio H. Maynard
APPROVAL H. Mancuso
APPROVAL
APPROVAL
NASA APPROVAL 7/26/63
MIT APPROVAL
MIT APPROVAL 7/26/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUPLING HALF,
QUICK DISCONNECT, FEMALE
SOURCE CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006659
SCALE NONE
WT
SHEET 1 OF 1

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03428	9/26/63	

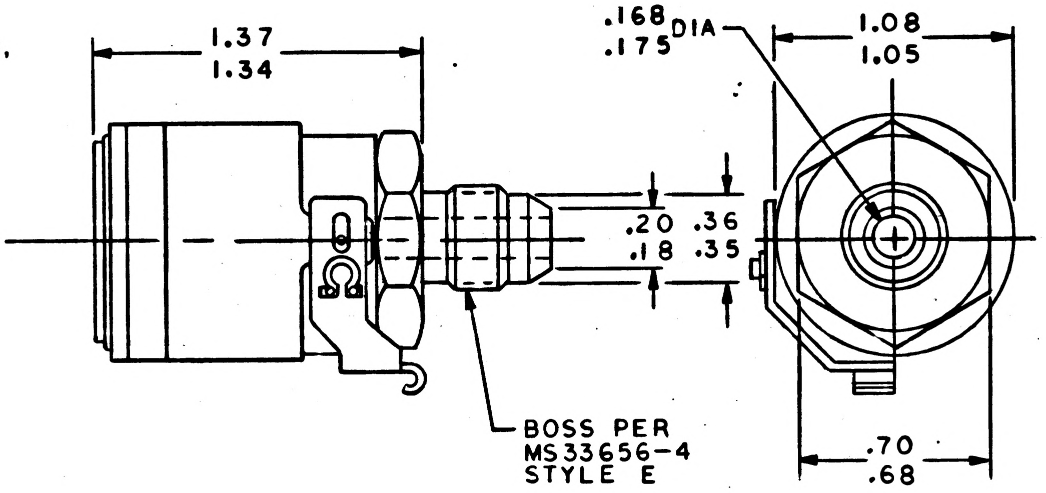
REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY OF PARTS ENCLOSED.

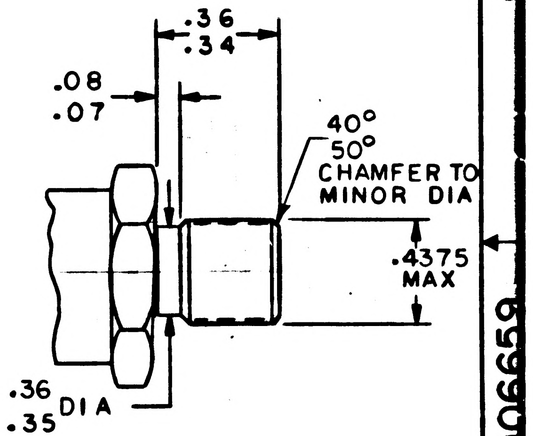
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
   - B. A CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL ACCOMPANY EACH SHIPMENT.
   - C. PROOF PRESSURE: 170 PSI MINIMUM (100 PERCENT INSPECTION).

3. DESIGN:
   - A. MATERIAL: CORROSION-RESISTANT STEEL IN ACCORDANCE WITH QQ-S-763, CLASS 303, CONDITION A.
   - B. FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072, METHOD E300.
   - C. UNIT SHALL BE CAPABLE OF USE WITH A FLUID MIXTURE OF:
     - ETHYLENE GLYCOL
     - WATER, TRIPLE DISTILLED
     - TRIETHANOLAMINEPHOSPHATE
     - SODIUMMERCAPTOBENZOTHIOZOLE
   - D. BURST PRESSURE: 300 PSI MINIMUM.
   - E. AIR INCLUSION: 0.002 IN^3 MAX.
   - F. OPERATING PRESSURE: 85 PSI MINIMUM.
   - G. SPILLAGE: 0.2 DROP MAXIMUM.
   - H. PRESSURE DROP: 2.5 PSI MAXIMUM.
   - J. FLOW: 1 GPM.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03428 DATE 26 Sep 63



1006659 – 2
AS SHOWN



1006659 – 1
SAME AS 1006659 – 2
EXCEPT MODIFIED AS
SHOWN

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN D. C. Campi DATE 24 Aug 63
CHECKED J. Ruggeri H. Maynard
APPROVAL H. Wanse
APPROVAL 8-29-63
APPROVAL 9-11-63
NASA APPROVAL 7/26/63
MIT APPROVAL C. Jelleman
MIT APPROVAL 7/26/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUPLING HALF, QUICK DISCONNECT, FEMALE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006659
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 04934 DATE 3 Dec 63

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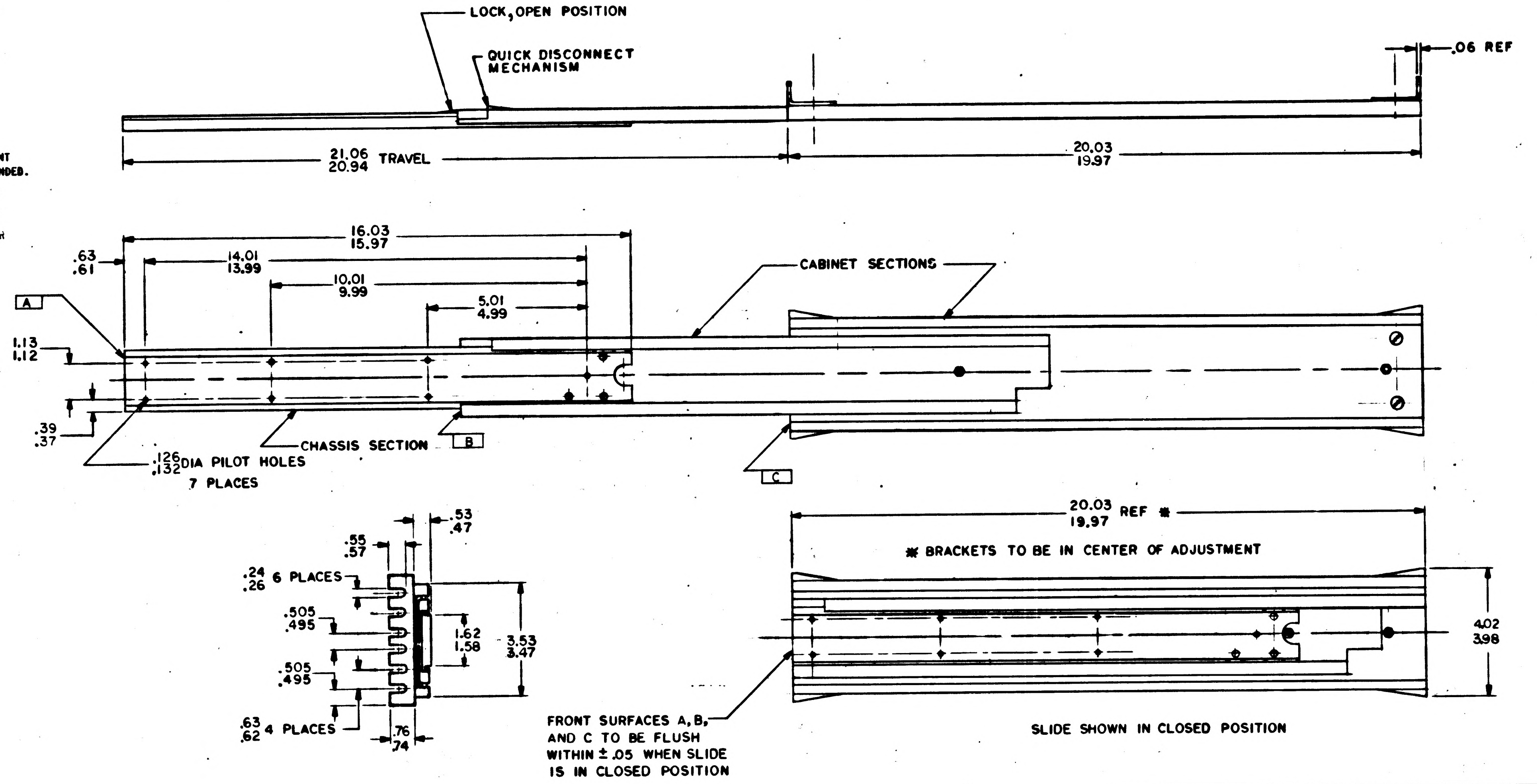
NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: EACH PART SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, PLUS NASA DRAWING NUMBER AND REVISION LETTER.

2. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL:
     - (1) SLIDE MEMBERS: ALUMINUM ALLOY EXTRUSIONS 7075-T6 IN ACCORDANCE WITH QQ-A-277.
     - (2) COMPONENT PARTS: CORROSION-RESISTING STEEL, 300 SERIES IN ACCORDANCE WITH MIL-S-5059 OR MIL-S-7720. BEARING BALLS SHALL BE 440 CORROSION-RESISTING STEEL.
   - B. FINISH:
     - (1) CHASSIS SECTION: ANODIZE PER MIL-S-8625, TYPE II, DYED BLACK PLUS DRY FILM LUBRICANT PER MIL-L-25504.
     - (2) CABINET SECTIONS: CLEAR ANODIZE PER MIL-A-8625, TYPE II.
   - C. LOAD CAPACITY: SLIDE SHALL BE CAPABLE OF SUPPORTING 200 POUNDS FROM THE MIDDLE OF THE CHASSIS SECTION WITHOUT TAKING A PERMANENT SET WHEN SLIDE IS MOUNTED IN HORIZONTAL POSITION AND FULLY EXTENDED.
   - D. SLIDE ACTION: SLIDES MAY BE EXTENDED TO FULL LENGTH BY PULLING OUT CHASSIS SECTION AND MUST LOCK OPEN. THEY MAY BE CLOSED ALL THE WAY, AGAINST STOPS, BY DEPRESSING THE "OPEN POSITION LOCK" AND TELESCOPING.


LOCK, OPEN POSITION
QUICK DISCONNECT MECHANISM
.06 REF
21.06 / 20.94 TRAVEL
20.03 / 19.97
16.03 / 15.97
14.01 / 13.99
10.01 / 9.99
5.01 / 4.99
.63 / .61
A
1.13 / 1.12
.39 / .37
CABINET SECTIONS
CHASSIS SECTION
B
C
.126 / .132 DIA PILOT HOLES 7 PLACES
.53 / .47
.55 / .57
.24 / .26 6 PLACES
.505 / .495
.505 / .495
1.62 / 1.58
3.53 / 3.47
.63 / .62 4 PLACES
.76 / .74
20.03 / 19.97 REF *
* BRACKETS TO BE IN CENTER OF ADJUSTMENT
4.02 / 3.98

FRONT SURFACES A, B, AND C TO BE FLUSH WITHIN ± .05 WHEN SLIDE IS IN CLOSED POSITION

SLIDE SHOWN IN CLOSED POSITION

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS-9-498
DRAWN DATE 18 OCT 63
CHECKED 18 NOV 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL 12/3/63
MIT APPROVAL 3 Dec 63
MIT APPROVAL 11-4-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE, CHASSIS,
QUICK DISCONNECT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006660
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03429	9/26/63	

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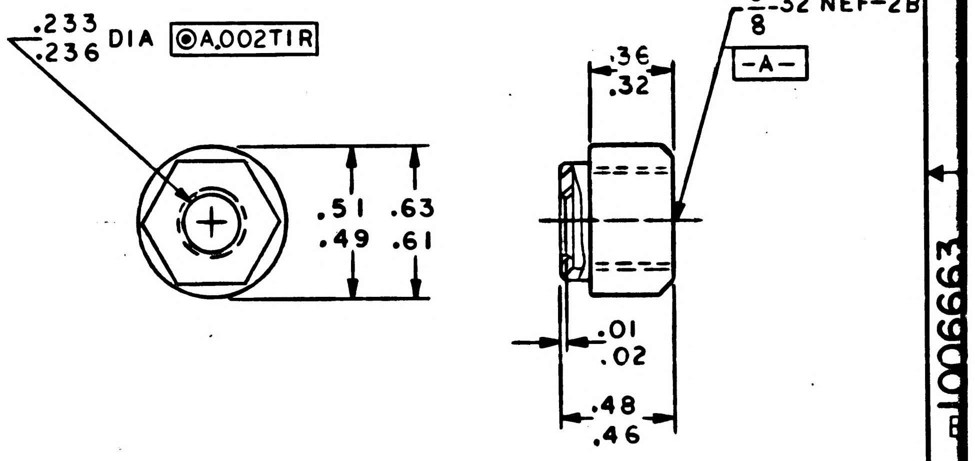
NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) TORQUE: 10 OUNCE-INCHES MINIMUM FOR A .248 DIAMETER BASIC SHAFT HAVING A 32 MICROINCH MAXIMUM SURFACE ROUGHNESS.
     - (2) MATERIAL AND FINISH: CERTIFICATION OF MATERIAL AND FINISH CONFORMITY IS REQUIRED WITH EACH SHIPMENT.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 10,000 CYCLES OF COMPLETE ROTATION (ONE CYCLE IS FROM CW-CCW-CW) WITHOUT LOSS OF TORQUE AS REQUIRED IN NOTE 2.A.(1).
   - B. STORAGE LIFE: INDEFINITE.
   - C. MATERIAL: BRASS NUT, MIL-B-895 NICKEL PLATED PER QQ-N-290, CLASS I, TYPE V ENCAPSULATED IN NYLON PER MIL-R-17091B, TYPE I.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03429 DATE 26 Sep 63



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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 23 Aug 63 / 30 Aug 63
CHECKED
APPROVAL
APPROVAL 9/6/63
APPROVAL 9/12/63
NASA APPROVAL 9/16/63
MIT APPROVAL 9/26/63
MIT APPROVAL 9/25/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SHAFT LOCK, DRAG TYPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006663
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006663

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04136	10/24/63	

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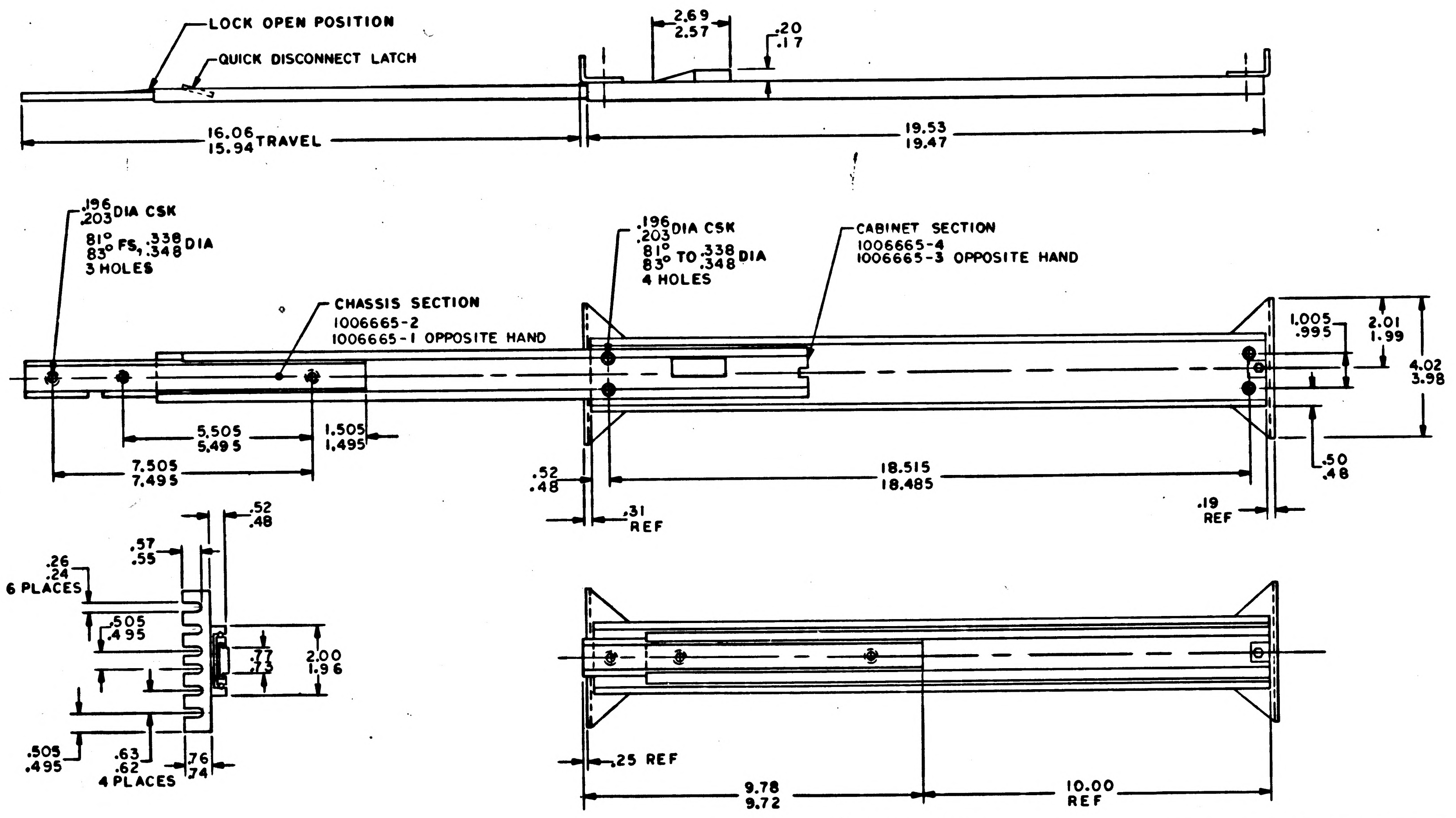
FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04136 DATE 10/24/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN MD 1015404, CLASS 3.
   - B. MARKING: EACH PART SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, PLUS NASA DRAWING NUMBER AND REVISION LETTER.

2. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL:
     - (1) SLIDE MEMBERS: ALUMINUM ALLOY EXTRUSIONS 7075-T6 IN ACCORDANCE WITH QQ-A-277.
     - (2) COMPONENT PARTS: CORROSION-RESISTING STEEL, 300 SERIES IN ACCORDANCE WITH MIL-S-5059 OR MIL-S-7720. BEARING BALLS SHALL BE 440 CORROSION-RESISTING STEEL.
   - B. FINISH:
     - (1) CHASSIS SECTION: ANODIZE PER MIL-S-8625, TYPE II, DYED BLACK PLUS DRY FILM LUBRICANT PER MIL-L-25504.
     - (2) CABINET SECTIONS: CLEAR ANODIZE PER MIL-S-8625, TYPE II.
   - C. LOAD CAPACITY: SLIDE SHALL BE CAPABLE OF SUPPORTING 200 POUNDS FROM THE MIDDLE OF THE CHASSIS SECTION WITHOUT TAKING A PERMANENT SET WHEN SLIDE IS MOUNTED IN HORIZONTAL POSITION AND FULLY EXTENDED.
   - D. SLIDE ACTION: SLIDES MAY BE EXTENDED TO FULL LENGTH BY PULLING OUT CHASSIS SECTION AND MUST LOCK OPEN. THEY MAY BE CLOSED ALL THE WAY BY DEPRESSING THE "OPEN POSITION LOCK". THE CHASSIS SECTION MAY BE COMPLETLY REMOVED BY DEPRESSING THE QUICK DISCONNECT LATCH.

DASH NO.	SLIDE PART
-1	CHASSIS RH
-2	CHASSIS LH
-3	CABINET RH
-4	CABINET LH


LOCK OPEN POSITION
QUICK DISCONNECT LATCH
2.69
2.57
.20
.17
16.06
15.94
TRAVEL
19.53
19.47
.196
.203 DIA CSK
81°
83° FS, .338
.348 DIA
3 HOLES
.196
.203 DIA CSK
81°
83° TO .338
.348 DIA
4 HOLES
CABINET SECTION
1006665-4
1006665-3 OPPOSITE HAND
CHASSIS SECTION
1006665-2
1006665-1 OPPOSITE HAND
1.005
.995
2.01
1.99
4.02
3.98
5.505
5.495
1.505
1.495
7.505
7.495
.52
.48
18.515
18.485
.50
.48
.31
REF
.19
REF
.52
.48
.57
.55
.26
.24
6 PLACES
.505
.495
.77
.73
2.00
1.96
.505
.495
.63
.62
4 PLACES
.76
.74
.25 REF
9.78
9.72
10.00
REF

SLIDE SHOWN IN CLOSED POSITION

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN MD 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN D.S. Cook DATE 10/8/63
CHECKED
APPROVAL
APPROVAL 10/14/63
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE, CHASSIS,
QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006665
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006665

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03429	9/26/63	

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NOTES:

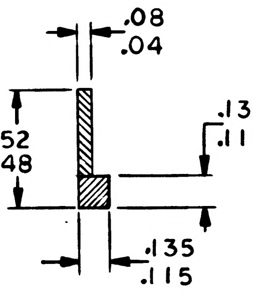
1. GENERAL REQUIREMENTS:
   - A. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

2. ACCEPTANCE AND INSPECTION:
   - A. MATERIAL:
     - (1) MOUNTING FLANGES: NEOPRENE RUBBER PER MIL-R-6130, TYPE II, GRADE A, MEDIUM.
     - (2) GASKET: NICKEL-COPPER ALLOY (MONEL) PER QQ-N-281.
     - (3) A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL REQUIREMENTS SPECIFIED HEREIN SHALL ACCOMPANY EACH SHIPMENT.
   - B. DIMENSIONS: AS SPECIFIED HEREIN.
   - C. MARKING: UNIT PACKAGES AND INTERMEDIATE AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER, THE MANUFACTURER'S NAME, DATE OF MANUFACTURE AND LOT NUMBER.

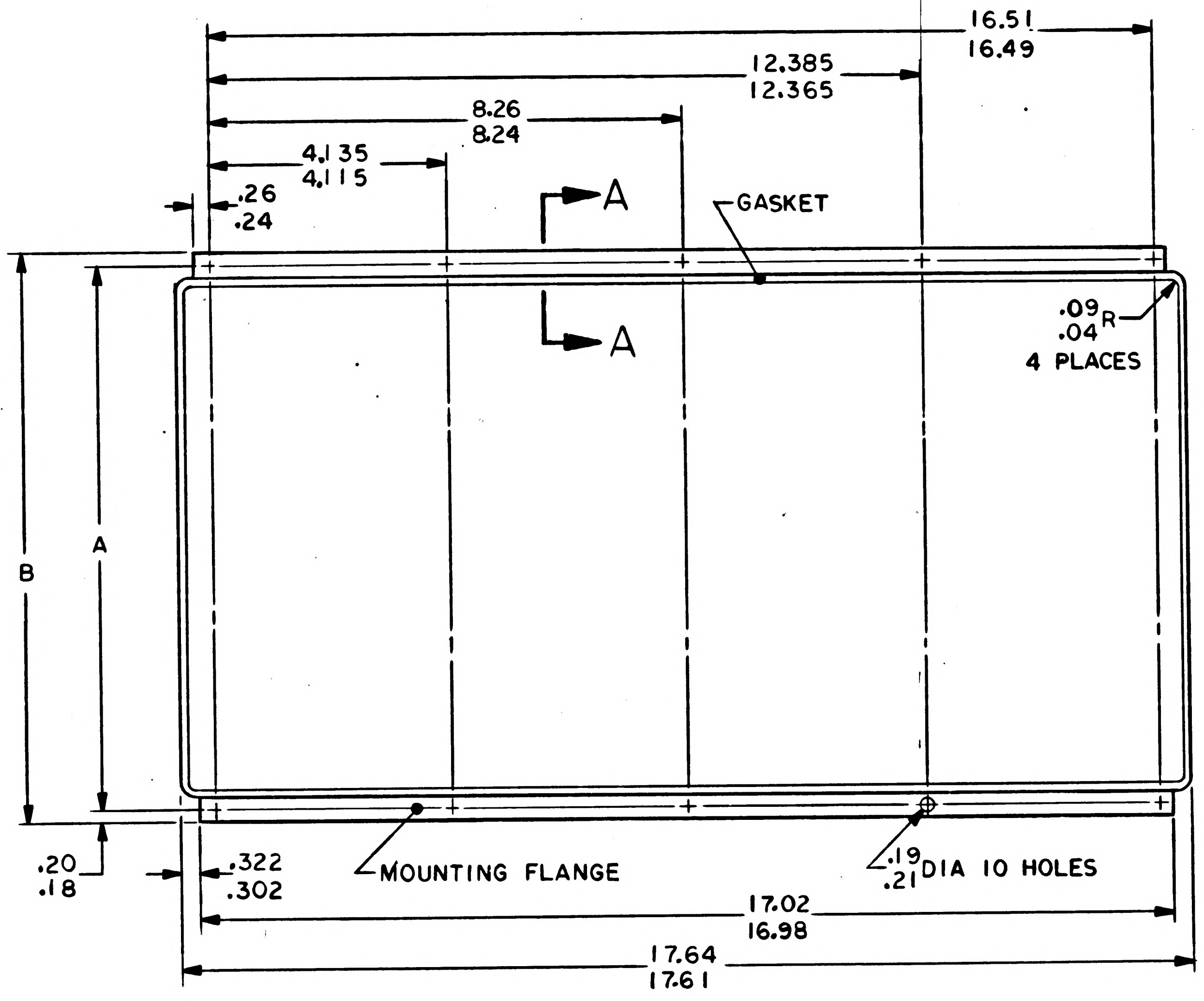
3. DESIGN:
   - A. ELECTRICAL CHARACTERISTICS:
     - (1) INSERTION LOSS: 40 TO 60 db.
     - (2) SHIELDING EFFECTIVENESS: 80 TO 100 db.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03429 DATE 26 Sep 63

DASH NO.	DIMENSIONS	
	A	B
1	11.021 11.041	11.55 11.51
2	9.271 9.291	9.80 9.76



SECTION A-A



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Ray Wheeler DATE 26 Aug 63
CHECKED S. Ruggeri / H. Maynard
APPROVAL C. Sperling JPK
APPROVAL 9/12/63
APPROVAL J.P. Pendleton 9/12/63
NASA APPROVAL 9/26/63
MIT APPROVAL 9/26/63
MIT APPROVAL D. Scolamiero 9/15/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SHIELDING GASKET, ELECTRONIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006667
SCALE NONE
WT
SHEET 1 OF 1

1006667

INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130. THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER WILL BE ON MARKER NO. 4. OTHER MARKERS SHALL BE AS SHOWN IN TABLE. "P" NUMBERS AND NASA PART NUMBER SHALL BE 7/32 HIGH, OTHER MARKING 5/32 HIGH. REELS AND SHIPPING CONTAINERS SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) NUMBER OF PIN TERMINALS: SEE TABLE I.

(2) MARKER SLEEVING SHALL BE MARKED PER TABLE I.

B. ELECTRICAL CHARACTERISTICS:

(1) THERE SHALL BE CONTINUITY BETWEEN TERMINALS OF THE CONNECTORS AS SHOWN ON THE SCHEMATICS.

(2) HI POT TEST: THERE SHALL BE NO EVIDENCE OF ARCING, SMOKING, BURNING, FLASHOVER OR DIELECTRIC FAILURE WITH APPLICATION OF 400 VDC BETWEEN WIRES AND BETWEEN WIRES AND SHIELD.

3. DESIGN:

A. LEADS SHALL BE TWISTED PAIRS AS INDICATED ON SCHEMATIC FOR APPLICABLE DASH NUMBER.

B. CONSTRUCTION:

(1) THE LEAD WIRES SHALL BE #22 AWG WHITE TEFLON INSULATED WRAPPED WITH 50 PERCENT MYLAR TAPE .001 THICK PER MIL-I-631, SHIELDED PER MIL-W-16878 AND COVERED WITH 1/16 WALL NEOPRENE TUBING PER MIL-R-6855, CLASS 2, GRADE 60.

(2) MARKER SLEEVING SHALL BE A THERMOPLASTIC MATERIAL.

(3) CONNECTORS SHALL BE PER MS 3116 TYPE WITH SOLDER TYPE CONTACTS, SHELL SIZE 22 FOR 55 PINS AND SHELL SIZE 24 FOR 61 PINS.

C. SHALL MATE WITH MS 3119 CONNECTOR.

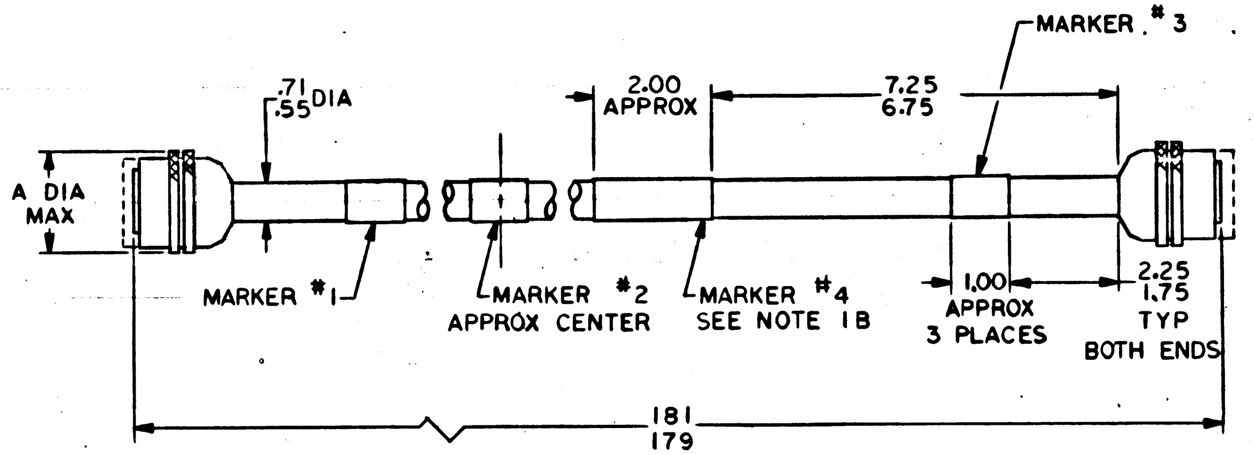
D. A SUITABLE INSULATOR SHALL BE PUT BETWEEN THE REAR OF THE CONNECTOR AND THE SHIELD, SO THAT THERE WILL BE NO ELECTRICAL CONDUCTIVITY BETWEEN THE SHELLS OF THE CONNECTORS.

E. SHALL BE FURNISHED WITH SUITABLE PROTECTIVE CAPS FOR CONNECTORS.

F. WIRES SHALL BE SOLDERED TO CONNECTORS PER MIL-S-6872.

G. CONNECTORS SHALL BE MOLDED TO CABLE.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04303 DATE 10/30/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002934 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NEXT ASSY	USED ON
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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS-9-498
DRAWN J.D. Ray W. Walsh DATE 10 Oct 63
CHECKED J. Rogen / W. Menard 10 Oct 63
APPROVAL C. Sperling Jr. RK
APPROVAL J. Zalech J.J.
APPROVAL J. G. Fitch Jr. 10/21/63
NASA APPROVAL W. Wieferich 10/30/63
MIT APPROVAL W. Kupfer 30 Oct 63
MIT APPROVAL A. Kolamos 10/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE ASSEMBLY, SHIELDED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006668
SCALE NONE WT
SHEET 1 OF 2

1006668

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

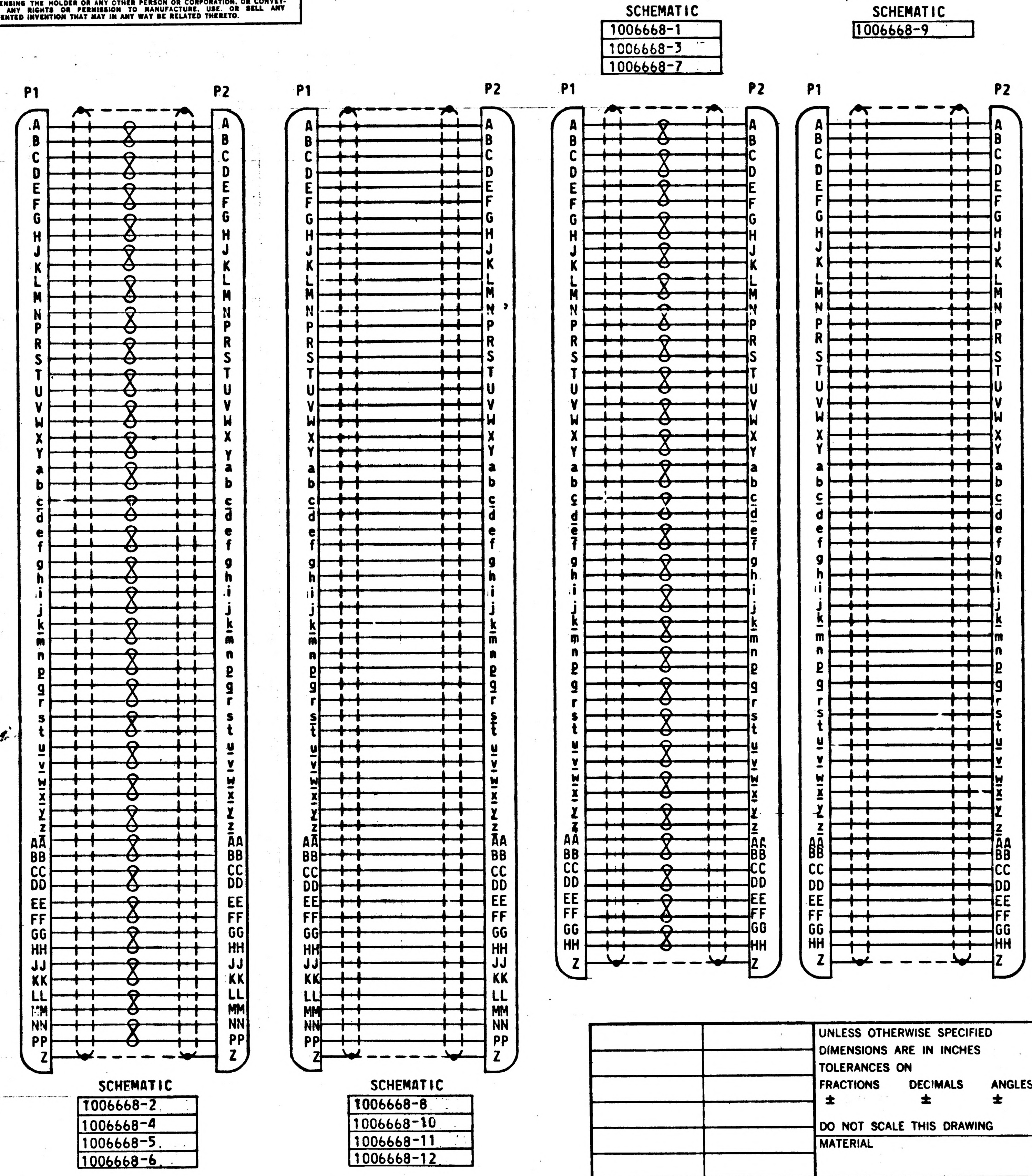
SCHEMATIC
1006668-1
1006668-3
1006668-7
SCHEMATIC
1006668-9
P1
P2
A B C D E F G H J K L M N P R S T U V W X Y a b c d e f g h i j k m n p q r s t u v w x y z AA BB CC DD EE FF GG HH JJ KK LL MM NN PP Z
SCHEMATIC
1006668-2
1006668-4
1006668-5
1006668-6
SCHEMATIC
1006668-8
1006668-10
1006668-11
1006668-12

TABLE I

DASH NO.	A DIA	NO. PINS	INSERT ARRANGEMENT	MARKER INFORMATION NO. 1	NO. 2	NO. 3	REV SYM
-1	1.66	55	MS33715-55S	P1 (J4 - IA)	W21	P2 (J1 - I)	-
-2	1.78	61	MS33716-61S	P1 (J7 - IA)	W22	P2 (J6 - I)	-
-3	1.66	55	MS33715-55SX	P1 (J10 - IA)	W23	P2 (J10 - I)	-
-4	1.78	61	MS33716-61SW	P1 (J5 - IA)	W24	P2 (J2 - I)	-
-5	1.78	61	MS33716-61SX	P1 (J8 - IA)	W25	P2 (J7 - I)	-
-6	1.78	61	MS33716-61SZ	P1 (J11 - IA)	W26	P2 (J11 - I)	-
-7	1.66	55	MS33715-55SW	P1 (J6 - IA)	W27	P2 (J3 - I)	-
-8	1.78	61	MS33716-61SY	P1 (J9 - IA)	W28	P2 (J8 - I)	-
-9	1.66	55	MS33715-55SY	P1 (J12 - IA)	W29	P2 (J12 - I)	-
-10	1.78	61	MS33716-61PX	P1 (J1 - IA)	W30	P2 (J4 - I)	-
-11	1.78	61	MS33716-61PZ	P1 (J2 - IA)	W31	P2 (J9 - I)	-
-12	1.78	61	MS33716-61PY	P1 (J3 - IA)	W32	P2 (J13 - I)	-

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 04303 DATE 10/30/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Roy Mack DATE 2 Oct 63
CHECKED J. Ruggemf H. Maynard 10 Oct 63
APPROVAL C Spurlin JRK
APPROVAL J. Mash
APPROVAL J. G. [illegible] 10/30/63
NASA APPROVAL [illegible] 10/30/63
MIT APPROVAL [illegible] 30 Oct 63
MIT APPROVAL [illegible] 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE ASSEMBLY, SHIELDED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006668
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006668

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04305		
A	CLASS II CHANGE PER RD-R5606 DR S.T. Orifice CHK W.J. Gifford APPD J. Maynard	1-7-64	H8
B	REVISED PER TDRR 06673 DR S.T. Orifice CHK JCJ APPD	5 MAR 64	KCO

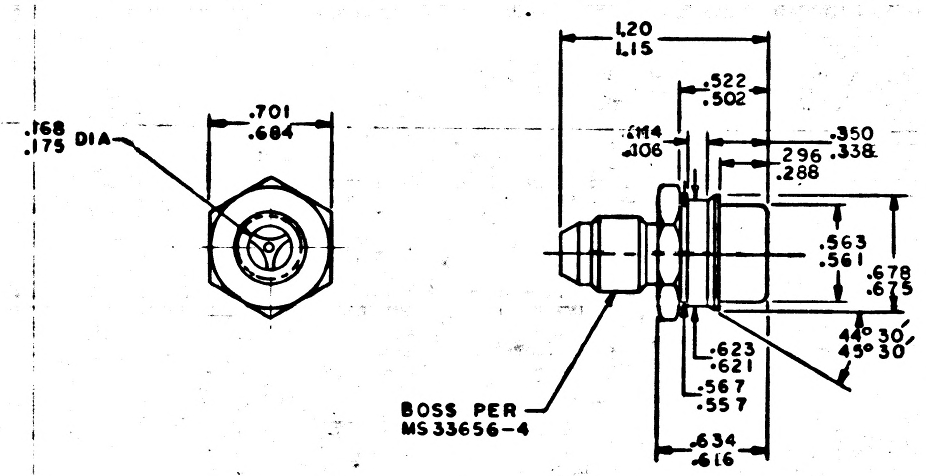
FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04305 DATE 10/30/63

REQUIREMENTS:

1. **GENERAL:**
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MD 1015404, CLASS 3.
   - B. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER, AND QUANTITY OF PARTS ENCLOSED.
2. **ACCEPTANCE AND INSPECTION:**
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
   - B. CERTIFICATION OF ALL DESIGN REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
3. **DESIGN:**
   - A. MATERIAL: CORROSION-RESISTANT STEEL IN ACCORDANCE WITH QQ-S-763, CLASS 303, CONDITION A.
   - B. FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072, METHOD E300.
   - C. UNIT SHALL BE CAPABLE OF USE WITH A FLUID MIXTURE OF:

COMPONENT	PARTS BY WEIGHT
ETHYLENE GLYCOL PER MIL-E-9500	62.500
TRIPLE DISTILLED WATER	37.422
TRIETHANOLAMINEPHOSPHATE	1.563
SODIUMMERCAPTOBENZOTHIOZOL	0.156

   - D. BURST PRESSURE: 300 PSI
   - E. AIR INCLUSION: 0.01 IN³ MAXIMUM.
   - F. OPERATING PRESSURE: .05 PSI MINIMUM.
   - G. SPILLAGE: 1 DROP PER DISCONNECT, MAXIMUM.
   - H. PRESSURE DROP: 0.5 PSI MAXIMUM.
   - J. FLOW: 1 GPM MINIMUM.
   - K. COUPLING HALF MALE IS TO MATE WITH COUPLING HALF FEMALE 1006659. DRAWING REQUIREMENTS TO APPLY IN BOTH MATED AND UNMATED CONDITION.
4. **SPECIAL CONDITIONING:**
   - A. PROOF PRESSURE: 170 PSI MINIMUM (100 PERCENT INSPECTION).



PROCURE ONLY FROM APPROVED SOURCES LISTED IN MD 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH: SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUPLING HALF, MALE, QUICK DISCONNECT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO 1006670
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006670

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NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER, AND QUANTITY OF PARTS ENCLOSED. AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER, AND QUANTITY OF PARTS ENCLOSED.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
   - B. CERTIFICATION OF ALL DESIGN REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

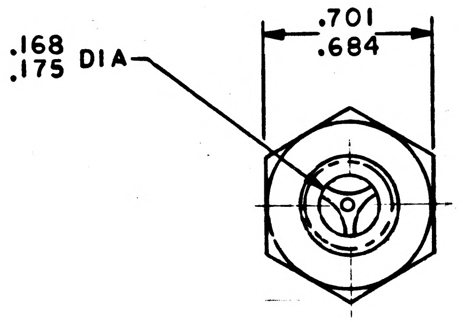
3. DESIGN:
   - A. MATERIAL: CORROSION-RESISTANT STEEL IN ACCORDANCE WITH QQ-S-763, CLASS 303, CONDITION A.
   - B. FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072, METHOD E300.
   - C. UNIT SHALL BE CAPABLE OF USE WITH A FLUID MIXTURE OF:

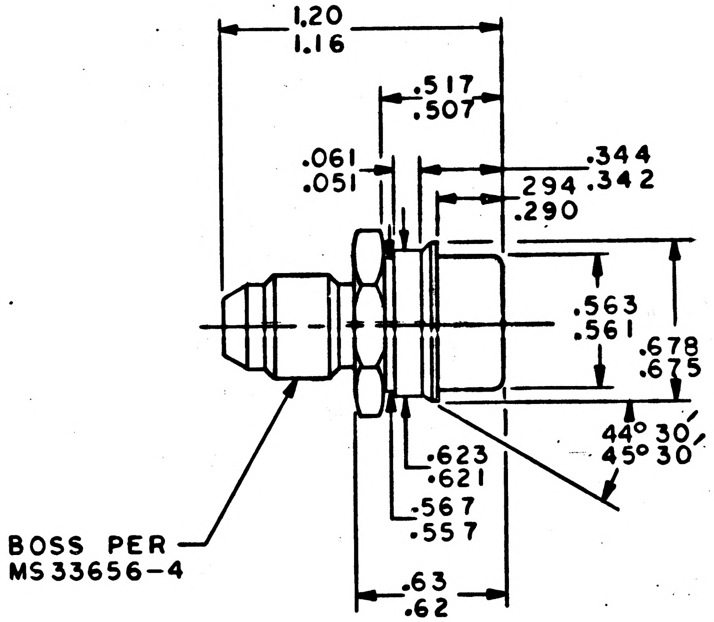
COMPONENT	PARTS BY WEIGHT
ETHYLENE GLYCOL PER MIL-E-9500	62.500
TRIPLE DISTILLED WATER	37.422
TRIETHANOLAMINEPHOSPHATE	1.563
SODIUMMERCAPTOBENZOTHIOZOL	0.156

   - D. BURST PRESSURE: 300 PSI MAXIMUM.
   - E. AIR INCLUSION: 0.01 IN^3 MAXIMUM.
   - F. OPERATING PRESSURE: 85 PSI MINIMUM.
   - G. SPILLAGE: 1 DROP PER DISCONNECT, MAXIMUM.
   - H. PRESSURE DROP: 0.5 PSI MAXIMUM.
   - J. FLOW: 1 GPM MINIMUM.

4. SPECIAL CONDITIONING:
   - A. PROOF PRESSURE: 170 PSI MINIMUM (100 PERCENT INSPECTION).

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04305 DATE 10/30/63





1006670

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 3 Sep 63
CHECKED 17 Sept 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL 10/30/63
MIT APPROVAL 30 Oct 63
MIT APPROVAL 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUPLING HALF, MALE,
QUICK DISCONNECT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006670
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	24Oct63	
A	CLASS II CHANGE PER RD-R5574A DR CHK APPD		JS
B	REVISED PER TDRR 08573 DR CHK APPD		KEB

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

(2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: - SEE SKETCH

B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE MALL PIN.

3. DESIGN:

A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
GUIDE PINS, GUIDE SOCKETS AND JACK SCREW INSERT - CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 METHOD E300.
INTERFACIAL SEAL - SILICONE RUBBER.
PIN CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
RETAINING AND INNER CONTACT SPRINGS:- BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

B. ELECTRICAL PROPERTIES:

(1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC

(2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

(3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

(4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006672.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04133 DATE 24Oct63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

B	B
A	A
-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN
CHECKED
APPROVAL
APPROVAL 10/16/63
APPROVAL 10/16/63
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006671
SCALE NONE
WT
SHEET 1 OF 2

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

FOR INFORMATION ONLY

CLASS B RELEASE TDRR 04133 DATE 24Oct63

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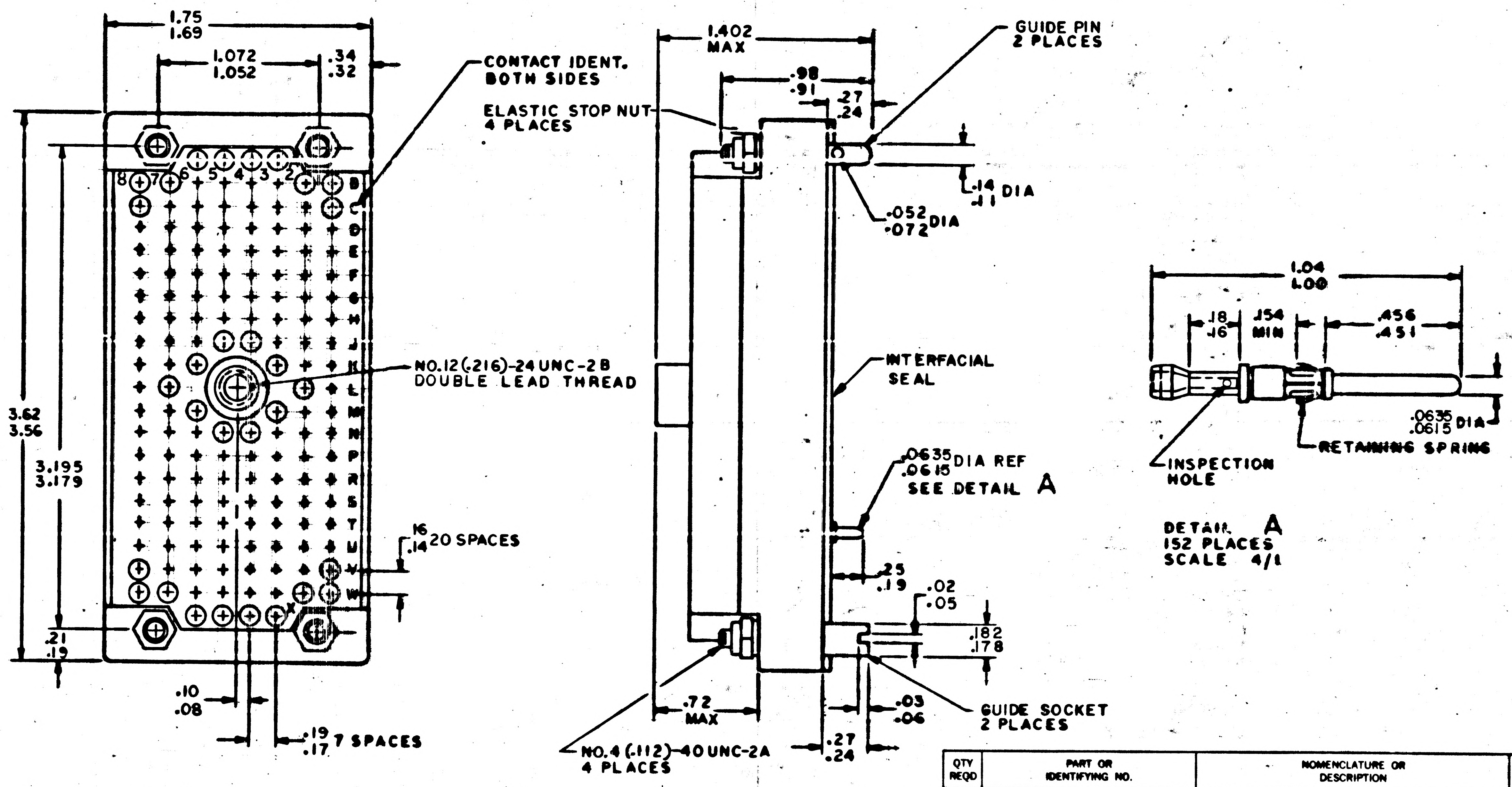
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
	04133	24Oct63	
A	CLASS II CHANGE PER RD-R5574A DR J. Orifice CHK J Ruggeri APPD		
B	REVISED PER TDRR 08573 DR G A Bishop CHK Mal Konig APPD H. Maynard	4/1/64	KEB


1.75
1.69
1.072
1.052
.34
.32
CONTACT IDENT. BOTH SIDES
8 7 6 5 4 3 2 1
B C D E F G H J K L M N P R S T U V W X
NO.12 (.216)-24 UNC-2B DOUBLE LEAD THREAD
3.62
3.56
3.195
3.179
.16
.14 20 SPACES
.21
.19
.10
.08
.19
.17 7 SPACES
1.402 MAX
.98
.91
.27
.24
ELASTIC STOP NUT 4 PLACES
GUIDE PIN 2 PLACES
.14
.11 DIA
.052
.072 DIA
INTERFACIAL SEAL
.0635
.0615 DIA REF SEE DETAIL A
.25
.19
.02
.05
.182
.178
.72 MAX
.03
.06
.27
.24
GUIDE SOCKET 2 PLACES
NO.4 (.112)-40 UNC-2A 4 PLACES
1.04
1.00
.18
.16
.154 MIN
.456
.451
.0635
.0615 DIA
INSPECTION HOLE
RETAINING SPRING
DETAIL A
152 PLACES
SCALE 4/1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN C. Crespi DATE 7 Oct 63
CHECKED J. Ruggeri / H. Maynard 11 Oct 63
APPROVAL C. Sperling
APPROVAL 10/16/63
APPROVAL 10/16/63
NASA APPROVAL
MIT APPROVAL 24Oct63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006671
SCALE 2/1
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	24Oct63	
A	CLASS II CHANGE PER RD-R5574A DR CHK J. Ruggeri APPD		JS
B	REVISED PER TDRR 00573 DR CHK APPD A. Maynard	4/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD A. Maynard		KEB

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

(2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE MALL PIN.

3. DESIGN:

A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
GUIDE PINS, GUIDE SOCKETS AND JACK SCREW INSERT - CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 METHOD E300.
INTERFACIAL SEAL - SILICONE RUBBER.
PIN CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
RETAINING AND INNER CONTACT SPRINGS - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

B. ELECTRICAL PROPERTIES:

(1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC

(2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

(3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

(4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006672.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04133 DATE 24Oct63

C	C
B	B
A	A
-	-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN C. Crespi DATE 27Sept63
CHECKED J. Ruggeri / A. Maynard
APPROVAL
APPROVAL 10/16/63
APPROVAL 10/16/63
NASA APPROVAL 10/24/63
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006671
SCALE NONE
WT
SHEET 1 OF 2

1006671

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FOR INFORMATION ONLY

CLASS B RELEASE TDRR 04133 DATE 24Oct63

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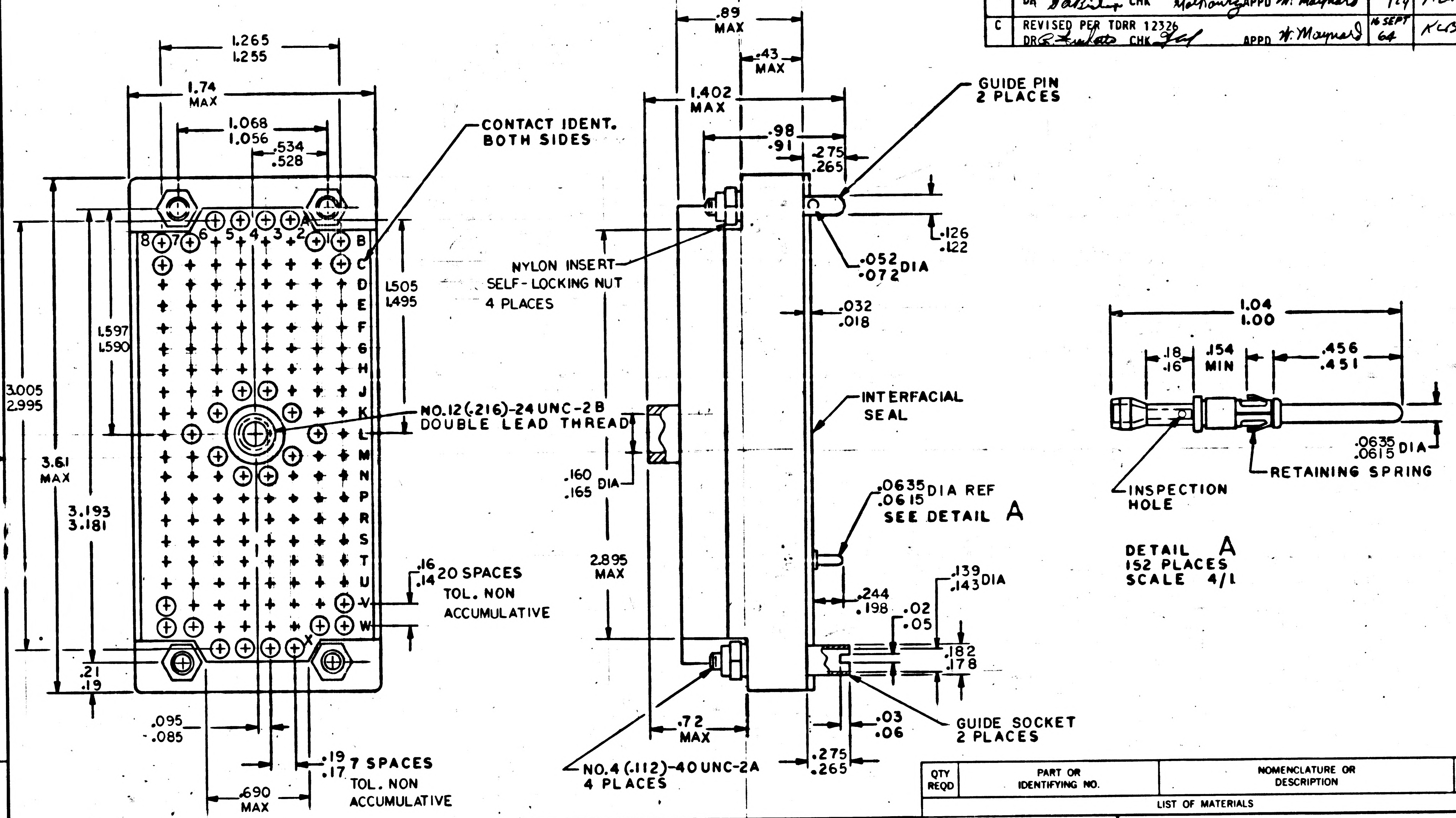
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
	04133	24Oct63	
A	CLASS II CHANGE PER RD-R5574A DR J. Orifice CHK J Ruggeri APPD	12/12/63	
B	REVISED PER TDRR 08573 DR D A Bishop CHK Hal Konig APPD W. Maynard	6/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD W. Maynard	16 SEPT 64	KCB



1.265
1.255
1.74 MAX
1.068
1.056
.534
.528
CONTACT IDENT. BOTH SIDES
8 7 6 5 4 3 2 1
B C D E F G H J K L M N P R S T U V W
X
1.505
1.495
1.597
1.590
3.005
2.995
3.61 MAX
3.193
3.181
.21
.19
NO.12 (.216)-24 UNC-2B DOUBLE LEAD THREAD
.16
.14
20 SPACES TOL. NON ACCUMULATIVE
.095
.085
.19
.17
7 SPACES TOL. NON ACCUMULATIVE
.690 MAX
.89 MAX
.43 MAX
1.402 MAX
.98
.91
.275
.265
GUIDE PIN 2 PLACES
.126
.122
.052
.072 DIA
NYLON INSERT SELF-LOCKING NUT 4 PLACES
.032
.018
INTERFACIAL SEAL
.160
.165 DIA
.0635
.0615 DIA REF SEE DETAIL A
2.895 MAX
.139
.143 DIA
.244
.198
.02
.05
.182
.178
.72 MAX
.03
.06
GUIDE SOCKET 2 PLACES
NO.4 (.112)-40 UNC-2A 4 PLACES
.275
.265
1.04
1.00
.18
.16
.154 MIN
.456
.451
.0635
.0615 DIA
RETAINING SPRING
INSPECTION HOLE
DETAIL A 152 PLACES SCALE 4/1

1006671

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN C. Grasso DATE 7 Aug 63
CHECKED J. Ruggeri 11 Sept 63
APPROVAL
APPROVAL 10/4/63
APPROVAL 10/4/63
NASA APPROVAL
MIT APPROVAL 24Oct63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ———
SIZE C
NASA DRAWING NO. 1006671
SCALE 2/1
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	24Oct63	
A	CLASS II CHANGE PER RD-R5574A DR CHK APPD		
B	REVISED PER TDRR 08573 DR CHK APPD A. Maynard	6/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD A. Maynard		KEB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 22258 DR J. Doty CHK APPD A. Maynard	9-28-65	

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   C. MARKING:

      (1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

      (2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: SEE SKETCH.

   B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE MALE PIN. (-000 ONLY)

3. DESIGN:

   A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
   GUIDE PINS, GUIDE SOCKETS AND JACK SCREW INSERT - CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 METHOD E300.

   INTERFACIAL SEAL - SILICONE RUBBER.
   PIN CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
   RETAINING AND INNER CONTACT SPRINGS:- BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

   B. ELECTRICAL PROPERTIES:

      (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
      600 VAC

      (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

      (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

      (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

   C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006672.

   D. ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NUMBER AND A -000 SUFFIX.

DASH NO.	DESCRIPTION
-000	CONNECTOR, RECEPTACLE WITH PINS (REF PARA 2.B.)
-001	CONNECTOR, RECEPTACLE LESS PINS (REF PARA 2.B.), GUIDE PINS & GUIDE SOCKETS
-002	GUIDE PIN, ONLY
-003	NUT, STOP
-004	GUIDE SOCKET, ONLY

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crawford DATE 27 Sept 63
CHECKED J. Ruggeri / A. Maynard
APPROVAL
APPROVAL 10/16/63
APPROVAL 10/16/63
NASA APPROVAL 10/24/63
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006671
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

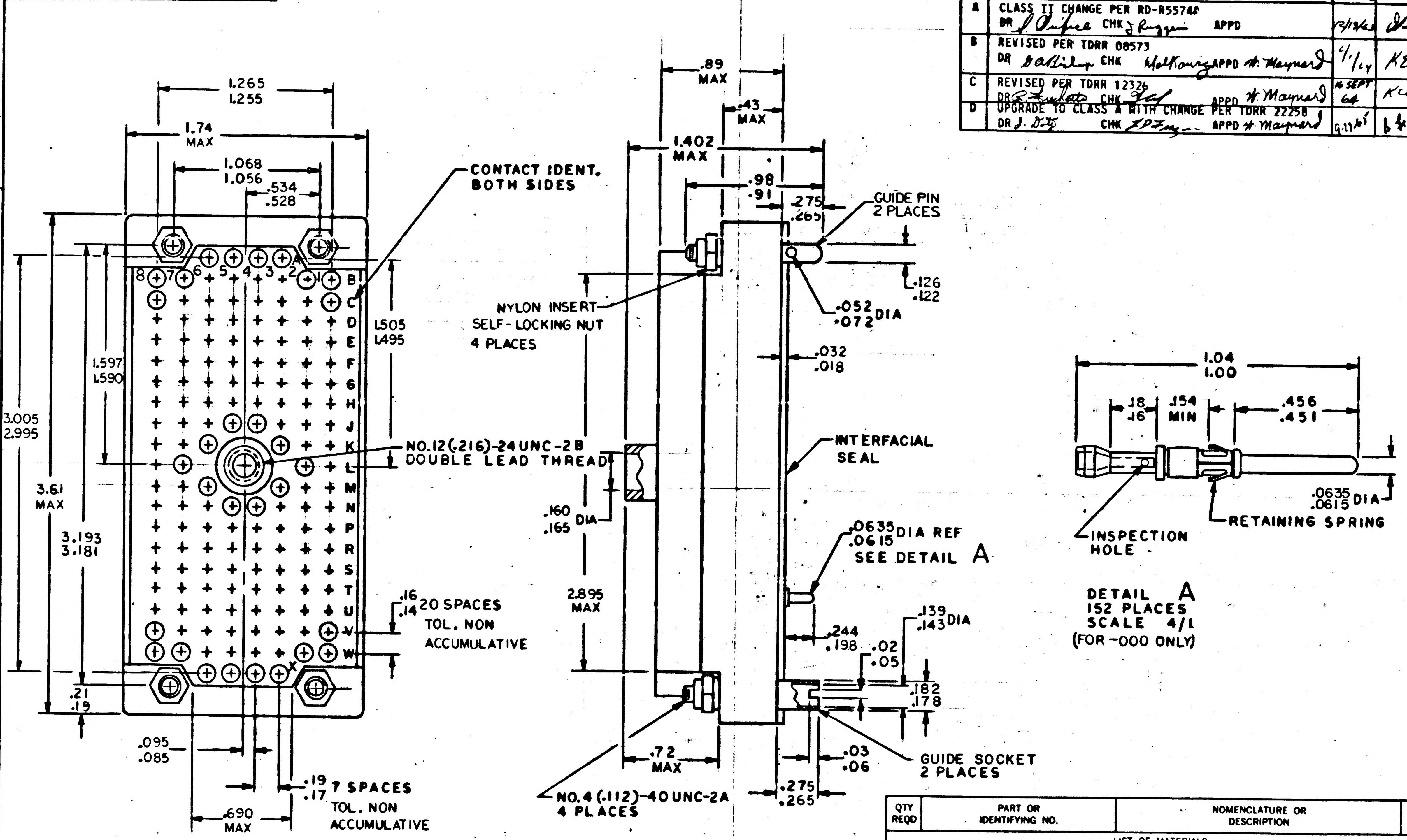
1006671 D

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
	04133	2 [illegible]	[illegible]
A	CLASS II CHANGE PER RD-R5574A DR J. Onifree CHK J Ruggeri APPD	12/12/63	[illegible]
B	REVISED PER TDRR 08573 DR G A Bishop CHK Walkowicz APPD H. Maynard	4/1/64	KEB
C	REVISED PER TDRR 12326 DR R. Furlotto CHK [illegible] APPD H. Maynard	16 SEPT 64	KCB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 22258 DR J. Doty CHK [illegible] APPD H. Maynard	6.27.65	[illegible]



1.265
1.255
1.74 MAX
1.068
1.056
.534
.528
8 7 6 5 4 3 2 1
A B C D E F G H J K L M N P R S T U V W X
1.505
1.495
1.597
1.590
3.005
2.995
3.61 MAX
3.193
3.181
.21
.19
.095
.085
.690 MAX
.19
.17
7 SPACES TOL. NON ACCUMULATIVE
.16
.14
20 SPACES TOL. NON ACCUMULATIVE
CONTACT IDENT. BOTH SIDES
NO.12(.216)-24UNC-2B DOUBLE LEAD THREAD
NYLON INSERT SELF-LOCKING NUT 4 PLACES
.89 MAX
.43 MAX
1.402 MAX
.98
.91
.275
.265
GUIDE PIN 2 PLACES
.126
.122
.052
.072 DIA
.032
.018
INTERFACIAL SEAL
.160
.165 DIA
2.895 MAX
.0635
.0615 DIA REF SEE DETAIL A
.244
.198
.02
.05
.139
.143 DIA
.182
.178
.72 MAX
.03
.06
.275
.265
GUIDE SOCKET 2 PLACES
NO.4 (.112)-40 UNC-2A 4 PLACES
1.04
1.00
.18
.16
.154 MIN
.456
.451
.0635
.0615 DIA
INSPECTION HOLE
RETAINING SPRING
DETAIL A
152 PLACES
SCALE 4/1
(FOR -000 ONLY)

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY	USED ON
APPLICATION	

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.

DRAWN C. Caccia DATE 7 Sept 63
CHECKED J. Ruggeri 11 Sept 63 H Maynard
APPROVAL C Sperling [illegible]
APPROVAL [illegible] 10/4/63
APPROVAL [illegible] 10/4/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 24 Oct 63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006671
SCALE 2/1
WT
SHEET 2 OF 2

1006671 D

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	24 Oct 63	
A	CLASS II CHANGE PER RD-R5574A DR CHK APPD		
B	REVISED PER TDRR 08573 DR CHK APPD A. Maynard	6/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD A. Maynard		KEB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 22258 DR CHK APPD A. Maynard	9-28-65	
E	CHANGED PER TDRR 26236 DR. W. Brown CHK C. D. APPD	3/23/66	

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

(2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE MALE PIN. (-000 ONLY)

3. DESIGN:

A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
GUIDE PINS, GUIDE SOCKETS AND JACK SCREW INSERT - CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 METHOD E300.

INTERFACIAL SEAL - SILICONE RUBBER.
PIN CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
RETAINING AND INNER CONTACT SPRINGS - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

B. ELECTRICAL PROPERTIES:

(1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC

(2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

(3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

(4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006672.

D. ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NUMBER AND A -000 SUFFIX.

DASH NO.	DESCRIPTION
-000	CONNECTOR, RECEPTACLE WITH PINS (REF PARA 2.B.)
-001	CONNECTOR, RECEPTACLE LESS PINS (REF PARA 2.B.), GUIDE PINS & GUIDE SOCKETS
-002	GUIDE PIN, ONLY
-003	NUT, STOP
-004	GUIDE SOCKET, ONLY

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NEXT ASSY	USED ON
APPLICATION	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crawford 27 Sept 63
CHECKED
APPROVAL
APPROVAL 10/16/63
APPROVAL
NASA APPROVAL 10/24/63
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006671
SCALE NONE
WT
SHEET 1 OF 2

1006671 E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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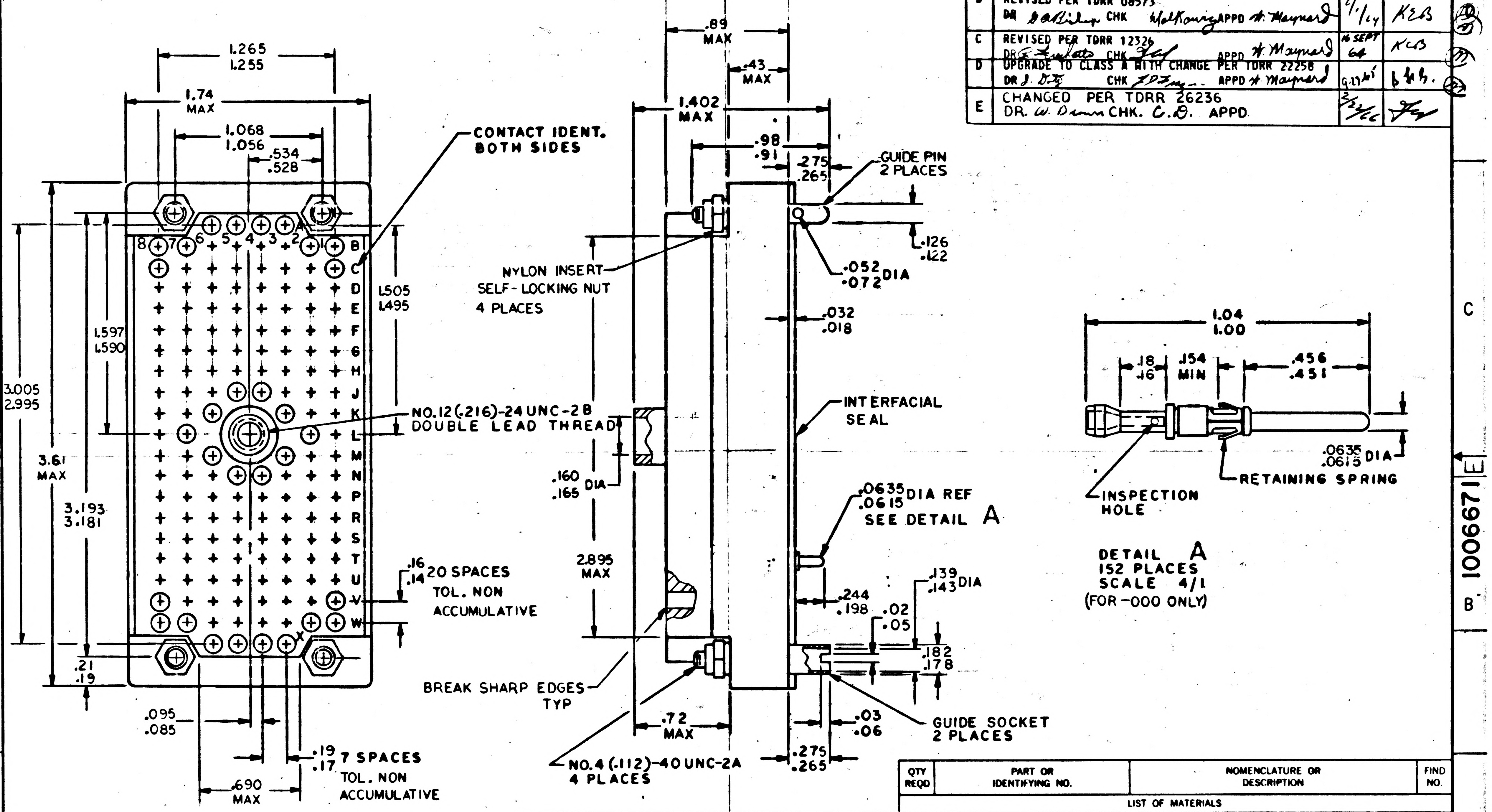
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
	04133	2 [illegible] 3	[illegible]
A	CLASS II CHANGE PER RD-R5574A DR J. Oufice CHK J Ruggeri APPD	12/19/63	[illegible]
B	REVISED PER TDRR 08573 DR D A Bishop CHK Malkowicz APPD H. Maynard	4/1/64	KEB
C	REVISED PER TDRR 12326 DR [illegible] CHK [illegible] APPD H. Maynard	16 SEPT 64	KCB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 22258 DR J. D. [illegible] CHK [illegible] APPD H. Maynard	9.17.65	[illegible]
E	CHANGED PER TDRR 26236 DR. W. Dann CHK. C. D. APPD.	2/23/66	[illegible]



1.265
1.255
1.74
MAX
1.068
1.056
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.528
CONTACT IDENT.
BOTH SIDES
8 7 6 5 4 3 2 1 A
B
C
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P
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U
V
W
X
1.505
1.495
1.597
1.590
3.005
2.995
3.61
MAX
3.193
3.181
NO.12(.216)-24 UNC-2B
DOUBLE LEAD THREAD
.16
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20 SPACES
TOL. NON
ACCUMULATIVE
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.19
.095
.085
.19
.17
7 SPACES
TOL. NON
ACCUMULATIVE
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.275
.265
GUIDE PIN
2 PLACES
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.122
.052
.072
DIA
NYLON INSERT
SELF-LOCKING NUT
4 PLACES
.032
.018
INTERFACIAL
SEAL
.160
.165
DIA
.0635
.0615
DIA REF
SEE DETAIL A
2.895
MAX
.244
.198
.139
.143
DIA
.02
.05
.182
.178
BREAK SHARP EDGES
TYP
.72
MAX
.03
.06
GUIDE SOCKET
2 PLACES
NO.4 (.112)-40 UNC-2A
4 PLACES
.275
.265
1.04
1.00
.18
.16
.154
MIN
.456
.451
.0635
.0615
DIA
INSPECTION
HOLE
RETAINING SPRING
DETAIL A
152 PLACES
SCALE 4/1
(FOR -000 ONLY)

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN C. Crespi DATE 7 Oct 63
CHECKED J. Ruggeri 11 Sept 63 H. Maynard
APPROVAL C. Sparling J.K.
APPROVAL [illegible] 10/4/63
APPROVAL [illegible] 10/4/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 2-4-63
MIT APPROVAL [illegible] 10/4/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006671
SCALE 2/1
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006671 E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	24Oct63	

REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - C. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND TERMINAL IDENTIFICATION. INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED ON THE BODY OF EACH UNIT ON BOTH SIDES.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
   - B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE MALE PIN.
3. DESIGN:
   - A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
     GUIDE PINS, GUIDE SOCKETS AND JACK SCREW INSERT - CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 METHOD E300.
     INTERFACIAL SEAL - SILICONE RUBBER.
     PIN CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
     RETAINING AND INNER CONTACT SPRINGS: - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.
   - B. ELECTRICAL PROPERTIES:
     - (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
       600 VAC
     - (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.
     - (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.
     - (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.
   - C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006672.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04133 DATE 24Oct63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

-	-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crespi DATE 7 Sept 63
CHECKED J. Ruggeri / H. Maynard 11 Sept 63
APPROVAL C. Sparling JAK
APPROVAL 10/16/63
APPROVAL 10/…/63
NASA APPROVAL 10/24/63
MIT APPROVAL 24Oct63
MIT APPROVAL 10/…/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006671
SCALE NONE WT SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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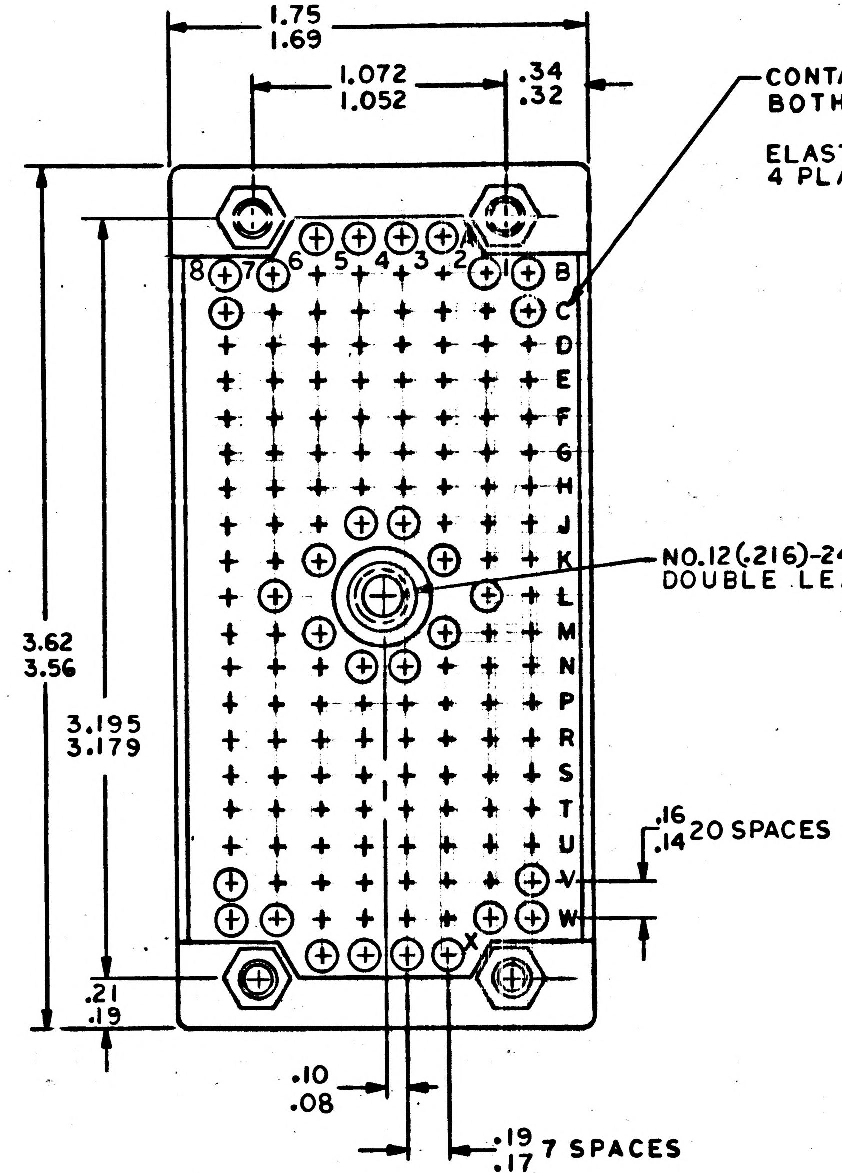
FOR INFORMATION ONLY

CLASS B RELEASE TDRR 04133 DATE 24 Oct 63

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
	04133	24 Oct 63	WJ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1.072
1.052
.34
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CONTACT IDENT. BOTH SIDES
8 7 6 5 4 3 2 1 A
B
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X
NO.12(.216)-24 UNC-2B DOUBLE LEAD THREAD
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.19
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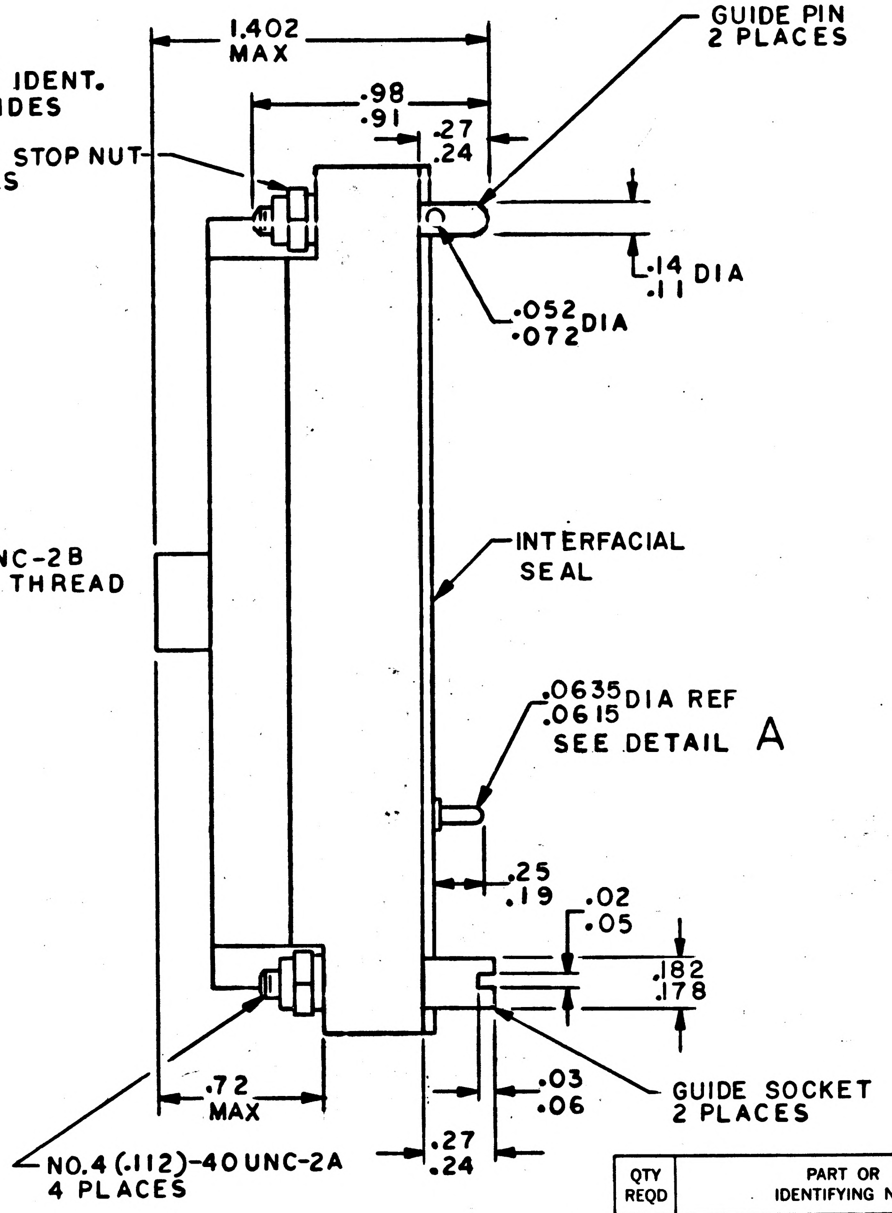
.17 7 SPACES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.24
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ELASTIC STOP NUT 4 PLACES
.14
.11 DIA
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.072 DIA
INTERFACIAL SEAL
.0635
.0615 DIA REF
SEE DETAIL A
.25
.19
.02
.05
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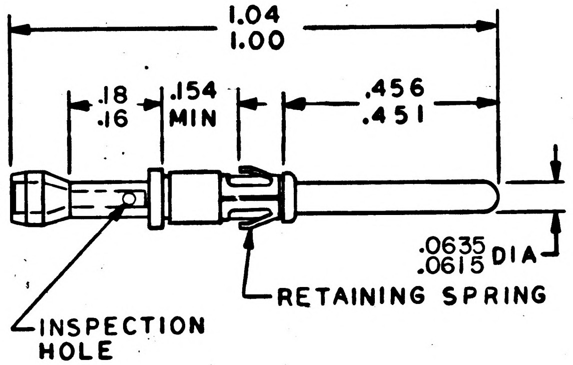
NO.4 (.112)-40 UNC-2A 4 PLACES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.456
.451
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.0615 DIA
RETAINING SPRING
INSPECTION HOLE

DETAIL A
152 PLACES
SCALE 4/1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN C. Crespi DATE 7 Sept 63
CHECKED J. Ruggieri / H. Maynard 11 Sept 63
APPROVAL C. Sperling
APPROVAL 10/14/63
APPROVAL 10/14/63
NASA APPROVAL 10/24/63
MIT APPROVAL 24 Oct 63
MIT APPROVAL 10/10/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
	C	1006671	
SCALE 2 / 1	WT		SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133		
A	CLASS II CHANGE PER RD-R5574A DR CHK J. APPD		
B	REVISED PER TDRR 00574 DR CHK APPD + Maynard	6/1/64	KEB

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   C. MARKING:

      (1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

      (2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: SEE SKETCH.

   B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE FEMALE SOCKETS.

3. DESIGN:

   A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
   GUIDE PINS, GUIDE SOCKETS AND JACK SCREW-CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072, METHOD E300.
   POTTING DAM - POLYAMIDE (NYLON) PLASTIC PER MIL-P-17091, TYPE I.
   INTERFACIAL SEAL - SILICONE RUBBER.
   SOCKET CONTACTS - BRASS, PLATED .00005 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
   RETAINING AND INNER CONTACT SPRINGS - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

   B. ELECTRICAL PROPERTIES:

      (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
      600 VAC

      (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

      (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

      (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

   C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006671.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04133 DATE 24 Oct 63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

B	B
A	—
-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Cook DATE
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
	C	1006672	
SCALE NONE	WT		SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

FOR INFORMATION ONLY

CLASS B RELEASE · TDRR 04133 DATE 24 Oct 63

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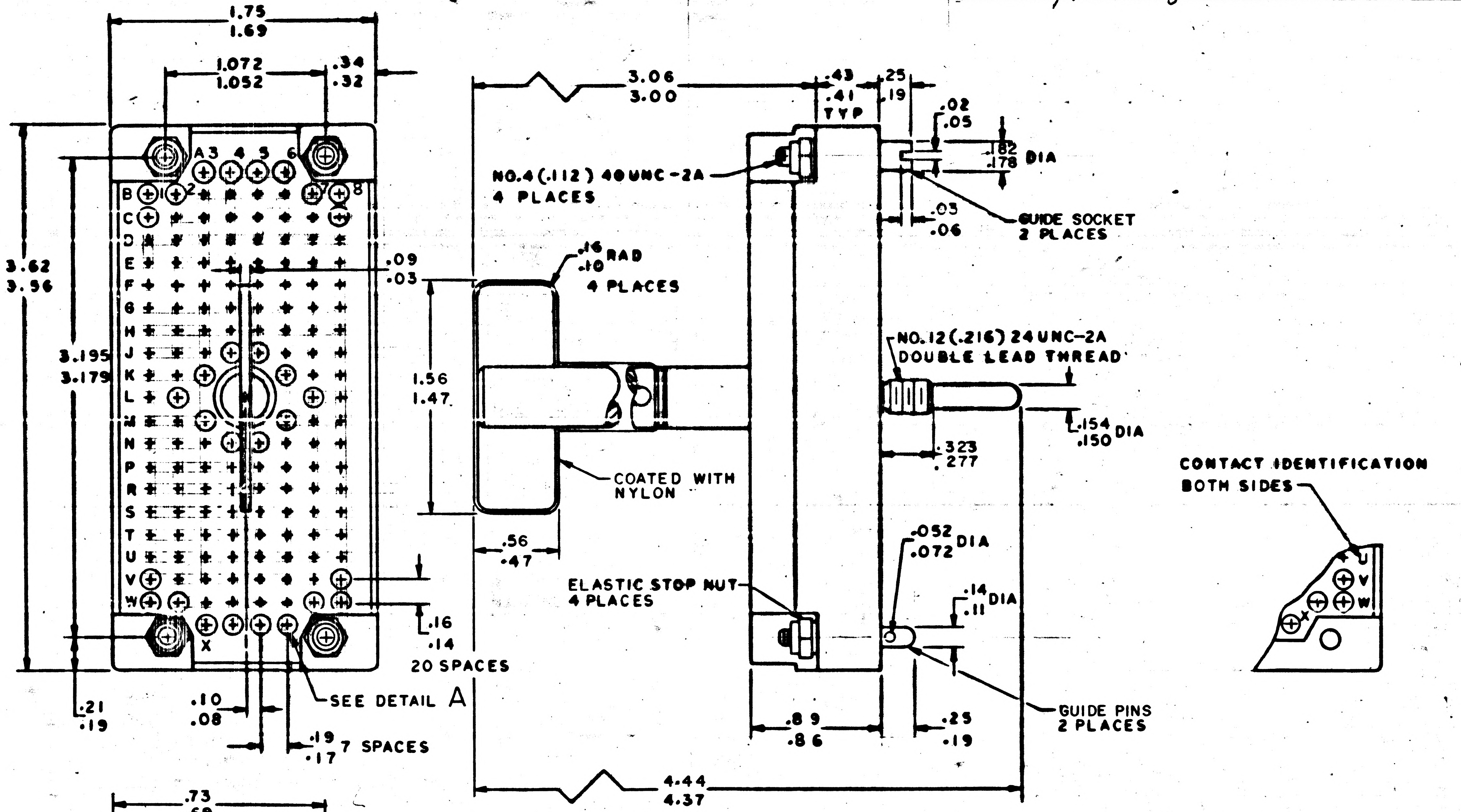
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
	04133	24Oct63	RH
B	REVISED PER TDRR 00574 DR S.T. Paifu CHK Wolkowicz APPD H. Maynard	1/10/64	KEG



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7 SPACES
SEE DETAIL A
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3.00
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TYP
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GUIDE SOCKET
2 PLACES
NO.4 (.112) 40 UNC-2A
4 PLACES
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COATED WITH
NYLON
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NO.12 (.216) 24 UNC-2A
DOUBLE LEAD THREAD
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ELASTIC STOP NUT
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GUIDE PINS
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BOTH SIDES
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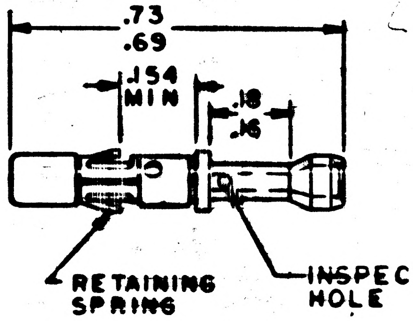
W
X



.73
.69
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MIN
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RETAINING
SPRING
INSPECTION
HOLE

DETAIL A
152 PLACES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.

DRAWN C. Calapi DATE 9 Sept 63
CHECKED J. Duggan / H. Maynard
APPROVAL C. Sperling JBK
APPROVAL Yakush JJS
APPROVAL JJP 10/63
NASA APPROVAL 10/24/63
MIT APPROVAL W. Hoeffer 24 Oct 63
MIT APPROVAL 10/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006672
SCALE NONE WT SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	[illegible]	[illegible]
A	CLASS II CHANGE PER RD-R5574A DR CHK APPD	[illegible]	[illegible]
B	REVISED PER TDRR 08574 DR CHK APPD H Maynard	6/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD H. Maynard	15 SEPT 64	KEB

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   C. MARKING:

      (1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

      (2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: SEE SKETCH.

   B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE FEMALE SOCKETS.

3. DESIGN:

   A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
   GUIDE PINS, GUIDE SOCKETS AND JACK SCREW-CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072, METHOD E300. THE JACKSCREW THREADS SHALL BE CLASS 324 CRES.
   INTERFACIAL SEAL - SILICONE RUBBER.
   SOCKET CONTACTS - BRASS, PLATED .00005 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
   RETAINING AND INNER CONTACT SPRINGS - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

   B. ELECTRICAL PROPERTIES:

      (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
      600 VAC

      (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

      (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

      (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

   C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006671.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04133 DATE 24 Oct 63

C	C
B	B
A	—
-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE
CHECKED J. Rigney
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006672
SCALE NONE WT SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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FOR INFORMATION ONLY
CLASS B RELEASE TDRR 04133 DATE 24 Oct 63

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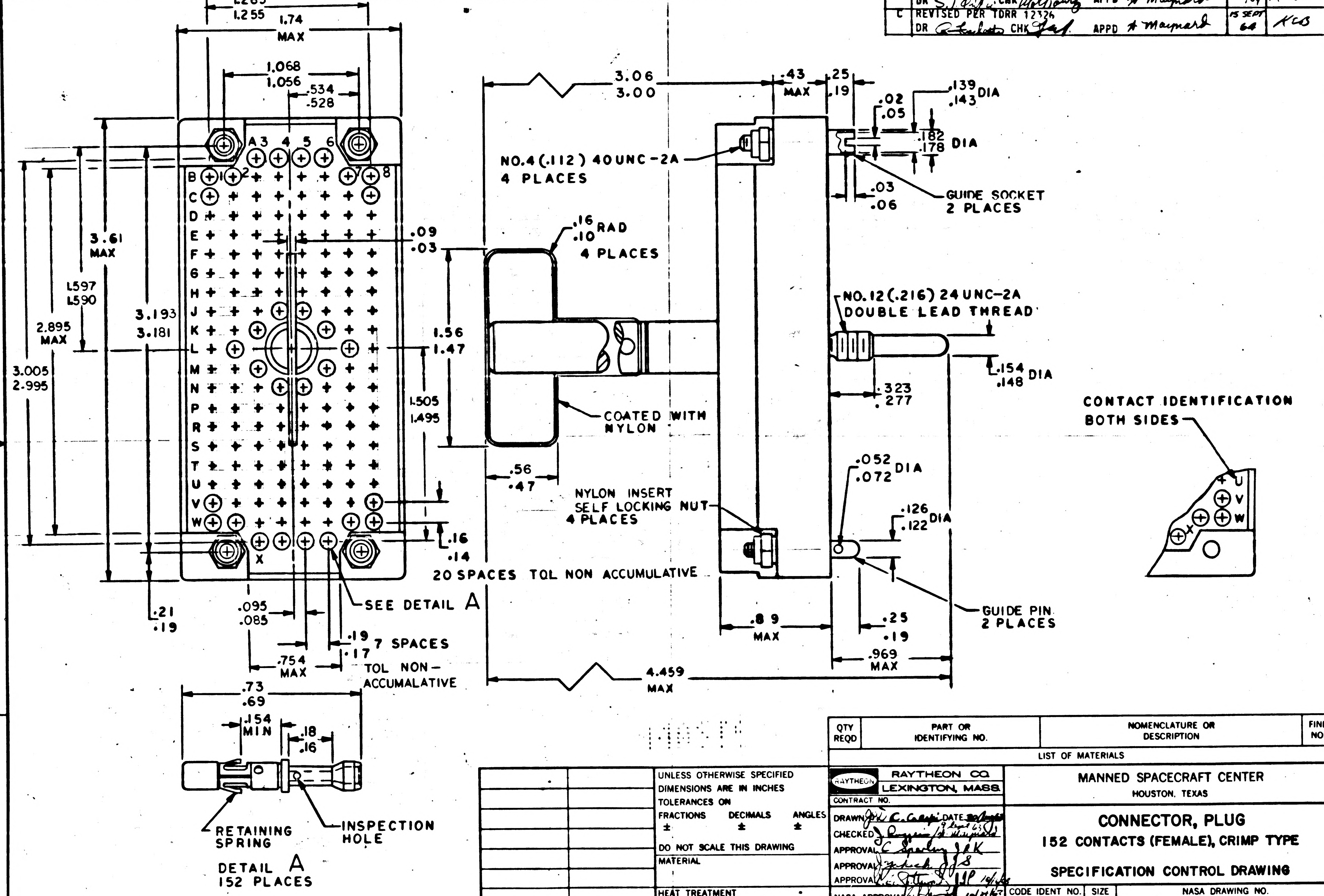
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
	04133	24 Oct 63	WI
B	REVISED PER TDRR 08574 DR S.T. Cifu CHK Wolkowicz APPD A Maynard	1/1/64	KEB
C	REVISED PER TDRR 12326 DR R. Fabatto CHK J.A.F. APPD A Maynard	15 SEPT 64	KCB



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TOL NON-
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RETAINING
SPRING
INSPECTION
HOLE
DETAIL A
152 PLACES
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GUIDE SOCKET
2 PLACES
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RAD
4 PLACES
NO.12 (.216) 24 UNC-2A
DOUBLE LEAD THREAD
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DIA
.323
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COATED WITH
NYLON
.56
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NYLON INSERT
SELF LOCKING NUT
4 PLACES
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.072
DIA
.126
.122
DIA
CONTACT IDENTIFICATION
BOTH SIDES
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V
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X
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MAX
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GUIDE PIN
2 PLACES
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MAX
4.459
MAX

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN Joe C. Carpi DATE 30 Aug 63
CHECKED J. Ruggiero 9 Sept 63 A Maynard
APPROVAL C Sparling J&K
APPROVAL Yuknick J S
APPROVAL V. Sitterson JP 10/1/63
NASA APPROVAL 10/24/63
MIT APPROVAL W. Hopper 24 Oct 63
MIT APPROVAL 10/1/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006672
SCALE NONE WT SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006672

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133		
A	CLASS II CHANGE PER RD-R5574A DR CHK APPD		
B	REVISED PER TDRR 08574 DR CHK APPD H Maynard	6/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD H. Maynard	15 SEPT 64	KEB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 19120 DR CHK W. Lyons APPD H Maynard	6-15-65	

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

C. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

(2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE FEMALE SOCKETS.

3. DESIGN:

A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
GUIDE PINS, GUIDE SOCKETS AND JACK SCREW-CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072, METHOD E300. THE JACKSCREW THREADS SHALL BE CLASS 324 CRES.
INTERFACIAL SEAL - SILICONE RUBBER.
SOCKET CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
RETAINING AND INNER CONTACT SPRINGS - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

B. ELECTRICAL PROPERTIES:

(1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC

(2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

(3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

(4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006671.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Campbell DATE
CHECKED J. Ruggeri
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006672
SCALE NONE
WT
SHEET 1 OF 2

1006672

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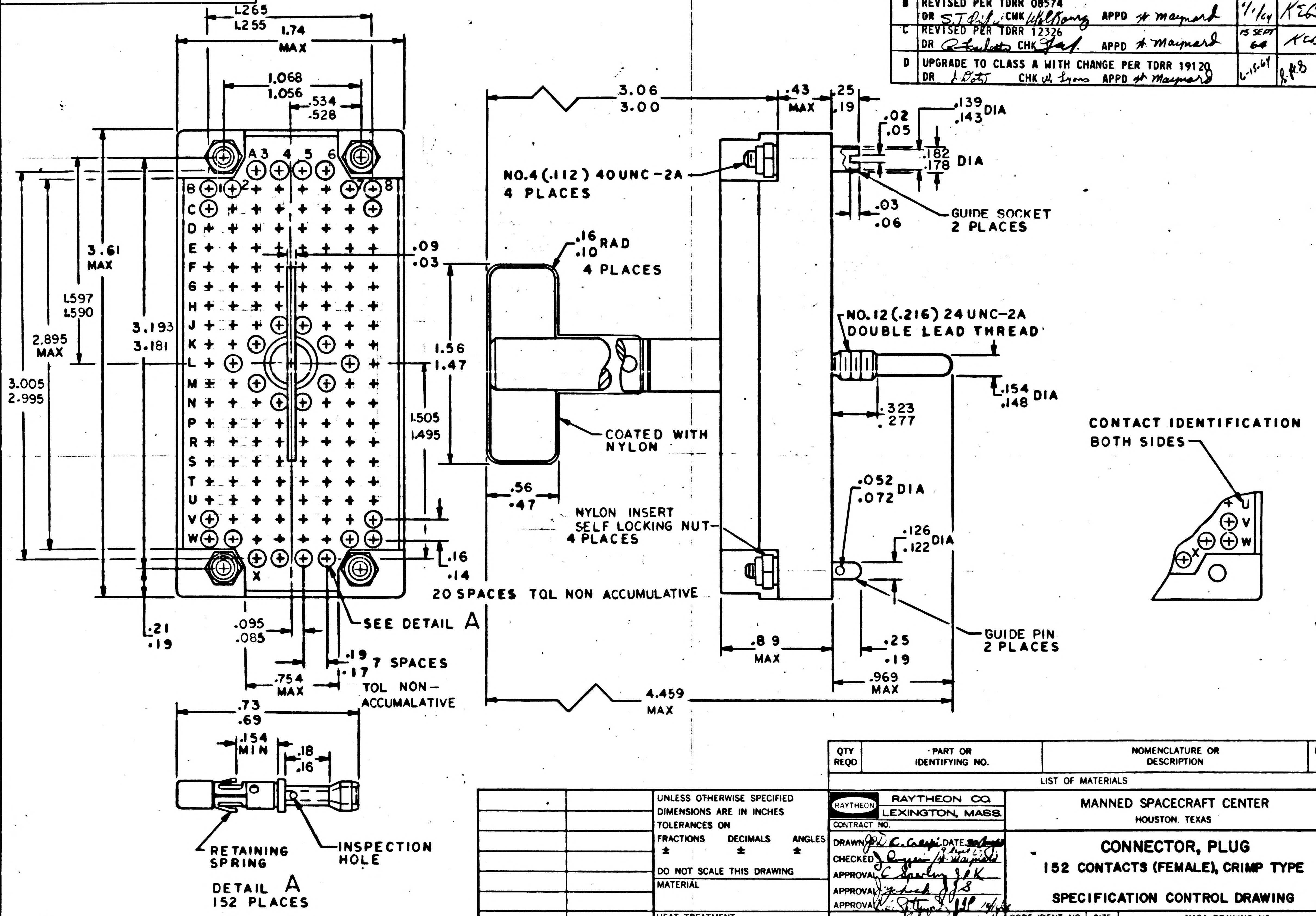
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
	04133	2 [illegible] 63	[illegible]
B	REVISED PER TDRR 08574 DR S.J. [illegible] CHK [illegible] APPD H. Maynard	1/1/64	KEB
C	REVISED PER TDRR 12326 DR [illegible] CHK [illegible] APPD H. Maynard	15 SEPT 64	KEB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 19120 DR J. Doty CHK W. Lyons APPD H. Maynard	6-15-64	J.H.B



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TOL NON-ACCUMALATIVE
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.143 DIA
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.178 DIA
NO.4 (.112) 40 UNC-2A 4 PLACES
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GUIDE SOCKET 2 PLACES
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.10 RAD 4 PLACES
NO.12 (.216) 24 UNC-2A DOUBLE LEAD THREAD
.154
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COATED WITH NYLON
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NYLON INSERT SELF LOCKING NUT 4 PLACES
.052
.072 DIA
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.122 DIA
GUIDE PIN 2 PLACES
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4.459 MAX
CONTACT IDENTIFICATION BOTH SIDES
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RETAINING SPRING
INSPECTION HOLE
DETAIL A 152 PLACES
1006672

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN J. C. Crespi DATE 30 Aug 63
CHECKED J. Ruggeri / H. Maynard 9 Sept 63
APPROVAL C. Sparling JJK
APPROVAL [illegible] JJS
APPROVAL [illegible] JLP 10/[illegible]
NASA APPROVAL [illegible] 10/[illegible]/63
MIT APPROVAL W. [illegible] 2 [illegible] 63
MIT APPROVAL [illegible] 10/[illegible]/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006672
SCALE NONE	WT	SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133		
A	CLASS II CHANGE PER RD-R5574A DR CHK APPD		
B	REVISED PER TDRR 00574 DR D.A. Bishop CHK APPD H Maynard	6/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD H. Maynard	15 SEPT 64	KEB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 19120 DR J. Doty CHK W. Lyons APPD H Maynard	6-15-65	
E	REVISED PER TDRR 22258 DR J. Doty CHK APPD H Maynard	9-23-65	

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

C. MARKING:

(1) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.

(2) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE FEMALE SOCKETS. (-000 ONLY)

3. DESIGN:

A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH
GUIDE PINS, GUIDE SOCKETS AND JACK SCREW-CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072, METHOD E300. THE JACKSCREW THREADS SHALL BE CLASS 324 CRES.
INTERFACIAL SEAL - SILICONE RUBBER.
SOCKET CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.
RETAINING AND INNER CONTACT SPRINGS - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

B. ELECTRICAL PROPERTIES:

(1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC

(2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

(3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

(4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006671.

D. ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NUMBER AND A -000 SUFFIX.

DASH NO.	DESCRIPTION
-000	CONNECTOR, PLUG WITH PINS, (REF PARA 2.B.)
-001	CONNECTOR, PLUG LESS PINS (REF PARA 2.B.), GUIDE PINS & GUIDE SOCKETS
-002	GUIDE PIN, ONLY
-003	JACK SCREW, ONLY
-004	SLEEVE, WASHER, THRUST
-005	NUT, STOP
-006	GUIDE SOCKET, ONLY
-007	BUSHING, THRUST (JACK SCREW)
-008	HANDLE ASSY, JACK SCREW
-009	TUBING

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE
CHECKED
APPROVAL JPK
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006672

SCALE NONE WT SHEET 1 OF 2

1006672 E

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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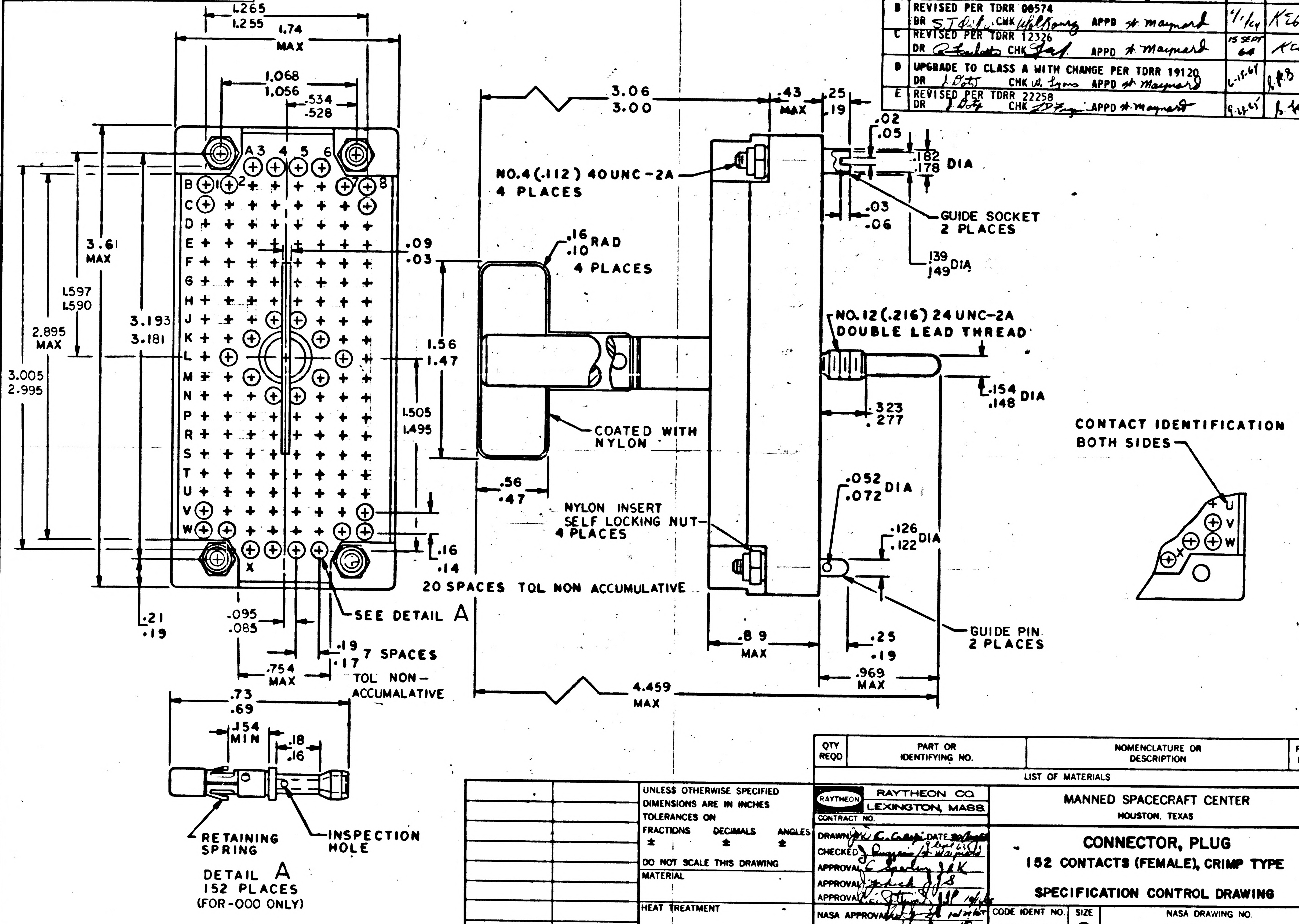
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
	04133	24	
B	REVISED PER TDRR 08574 DR S.J. CHK APPD H. Maynard	1/1/64	KEB
C	REVISED PER TDRR 12326 DR CHK APPD H. Maynard	15 SEPT 64	KEB
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 19120 DR J. Doty CHK W. Lyons APPD H. Maynard	6-15-64	J.F.B.
E	REVISED PER TDRR 22258 DR J. Doty CHK APPD H. Maynard	9-27-65	J.F.B.


1.265
1.255
1.74 MAX
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A 3 4 5 6
B 1 2 8
C D E F G H J K L M N P R S T U V W X
3.61 MAX
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20 SPACES TOL NON ACCUMULATIVE
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7 SPACES
.754 MAX
TOL NON-ACCUMALATIVE
SEE DETAIL A
3.06
3.00
.43 MAX
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.182
.178 DIA
NO.4 (.112) 40 UNC-2A 4 PLACES
.16
.10 RAD 4 PLACES
GUIDE SOCKET 2 PLACES
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.149 DIA
NO.12 (.216) 24 UNC-2A DOUBLE LEAD THREAD
.154
.148 DIA
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COATED WITH NYLON
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NYLON INSERT SELF LOCKING NUT 4 PLACES
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.072 DIA
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GUIDE PIN 2 PLACES
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.969 MAX
4.459 MAX
CONTACT IDENTIFICATION BOTH SIDES
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.16
RETAINING SPRING
INSPECTION HOLE
DETAIL A
152 PLACES
(FOR-000 ONLY)

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN J. C. Carpi DATE 30 Aug
CHECKED 9 Sept 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006672
SCALE NONE
WT
SHEET 2 OF 2

1006672 E

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	24Oct63	WK

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER, AND TERMINAL IDENTIFICATION. INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED ON THE BODY OF EACH UNIT ON BOTH SIDES.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 15 NUMBER 16 AND 150 NUMBER 20 UNASSEMBLED CRIMP TYPE FEMALE SOCKETS.

3. DESIGN:

A. MATERIAL: BODY - GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH GUIDE PINS, GUIDE SOCKETS AND JACK SCREW-CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072, METHOD E300.

POTTING DAM - POLYAMIDE (NYLON) PLASTIC PER MIL-P-17091, TYPE I.

INTERFACIAL SEAL - SILICONE RUBBER.

SOCKET CONTACTS - BRASS, PLATED .00003 MINIMUM GOLD OVER .00020 MINIMUM SILVER.

RETAINING AND INNER CONTACT SPRINGS - BERYLLIUM COPPER, NICKEL PLATED .0001 MINIMUM.

B. ELECTRICAL PROPERTIES:

(1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC

(2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.

(3) CURRENT RATING: 7.5 AMPERES MAXIMUM.

(4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING 1006671.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04133 DATE 24Oct63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Cooper DATE 30 Aug 63
CHECKED J. Riggins
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL 10/24/63
MIT APPROVAL 24 Oct 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006672
SCALE NONE WT SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
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PHOTOGRAPHIC SCALE ONLY

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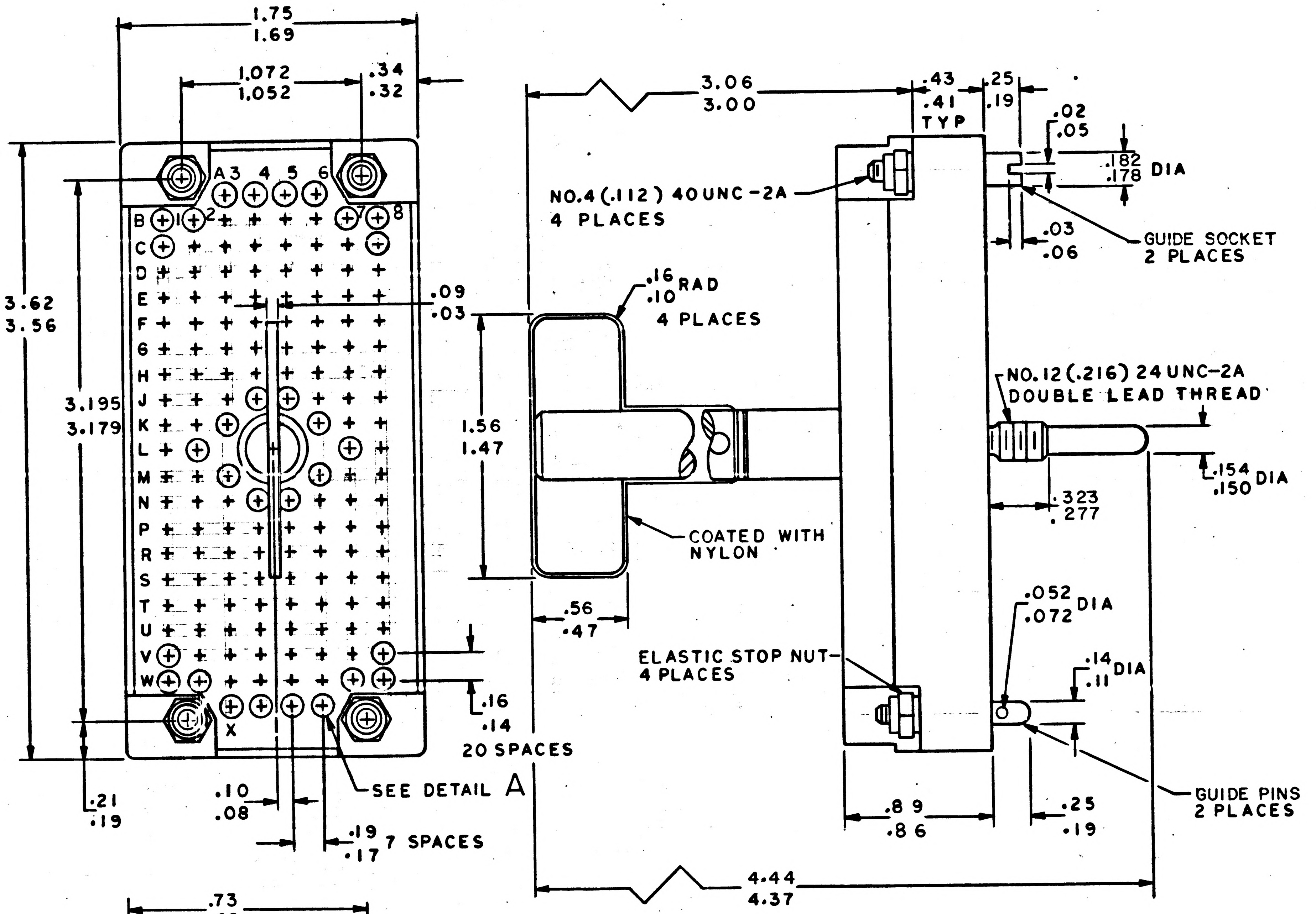
FOR INFORMATION ONLY

CLASS B RELEASE TDRR 04133 DATE 24 Oct 63

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
	04133	24Oct63	WH



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4 PLACES
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GUIDE SOCKET
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COATED WITH NYLON
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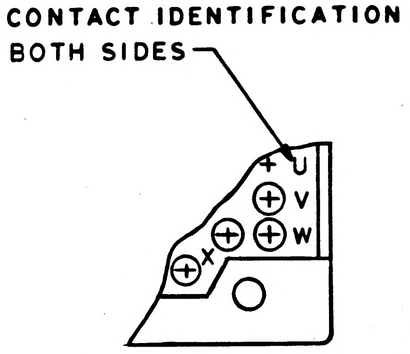
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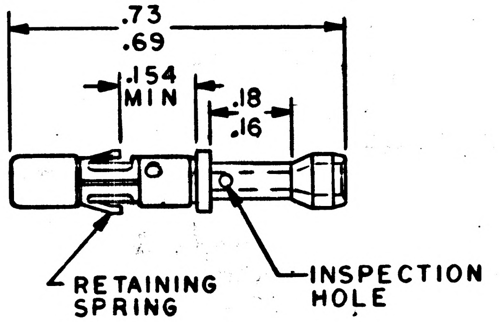

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RETAINING SPRING
INSPECTION HOLE

DETAIL A
152 PLACES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN JPD C. Crespi DATE 30 Aug 63
CHECKED J. Ruggeri 9 Sept 63 / H. Marquardt
APPROVAL C. Sparling JRK
APPROVAL J. Yokuch JJS
APPROVAL JJP 10/1/63
NASA APPROVAL 10/24/63
MIT APPROVAL W. Snyder 24 Oct 63
MIT APPROVAL Dennis M. Johnson 10/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
152 CONTACTS (FEMALE), CRIMP TYPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006672
SCALE NONE	WT	SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006672

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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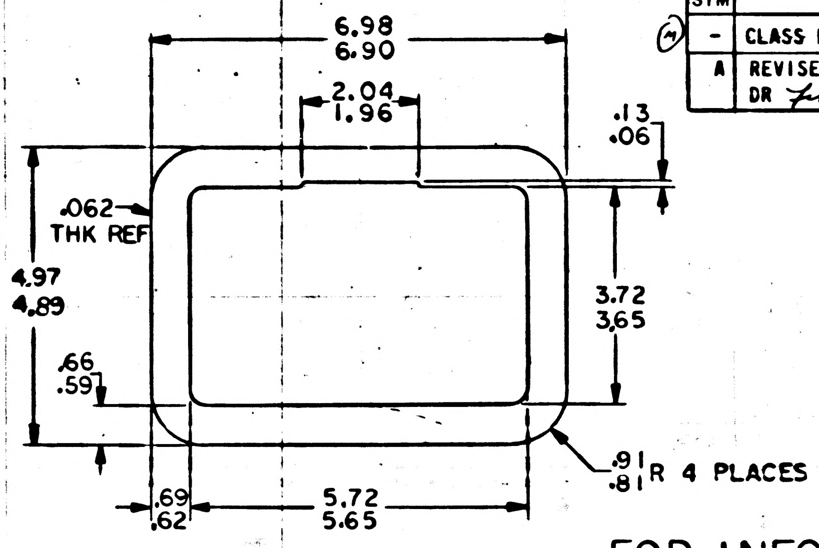
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03584		
A	REVISED PER TDRR 06678 DR ~~JLLP~~ CHK JCJ APPD	9 MAR 64	REB

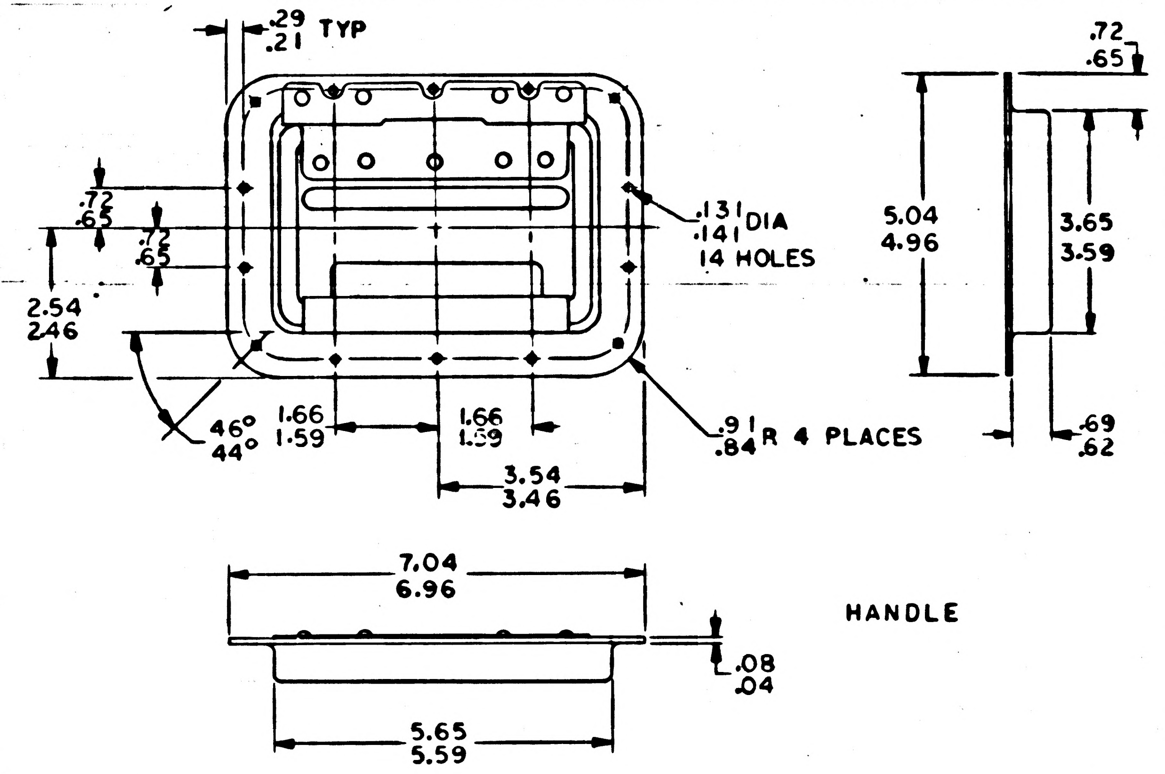
NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: HANDLES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND NASA PART NUMBER.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. HANDLE IS SUPPLIED WITH GASKET.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS: (SAMPLE)
   - A. MECHANICAL REQUIREMENTS:
     - (1) ACTION: HANDLE BAIL SHALL LIFT TO A MINIMUM OF 90° FROM AT REST POSITION. A SPRING SHALL RETURN THE BAIL COMPLETELY. THE HANDPIECE SHALL BE NON-METALLIC AND FREE TO TURN ON THE BAIL.
3. DESIGN REQUIREMENTS:
   - A. MATERIAL:
     - (1) PLATE: .064 THK ALUMINUM PER QQ-A-318 (5052-0)
     - (2) BAIL RETAINER: .064 THK STEEL (SAE 1010)
     - (3) BAIL: .312 DIAMETER STEEL WIRE PER QQ-W-461
     - (4) SPRING: .050 DIAMETER CRES WIRE PER QQ-S-766, CLASS 4, COND C (302).
     - (5) HANDPIECE: .529 DIAMETER BLACK PLASTIC PER MIL-I-631, TYPE F, FORM U, GRADE A, CLASS 2.
     - (6) GASKET: NEOPRENE PER MIL-R-3065
   - B. FINISH:
     - (1) STEEL PARTS: CADMIUM PLATE PER QQ-P-416, TYPE II, CLASS I.
     - (2) ALUMINUM PARTS: CHROMATE FILM PER MIL-C-5541.
   - C. LOAD RATING: 200 POUNDS PER HANDLE.



GASKET

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Wheeler DATE 12 Sept 63
CHECKED J. Ruggiero / W. Kenjunas 20 Sept 63
APPROVAL JAK
APPROVAL JJB 9/20/63
APPROVAL RPB 9/20/63
NASA APPROVAL W. J. Rhine 10-3-63
MIT APPROVAL L. Gediman 10/1/63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HANDLE, BAIL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006673
SCALE NONE	WT	SHEET 1 OF 1

1006673

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

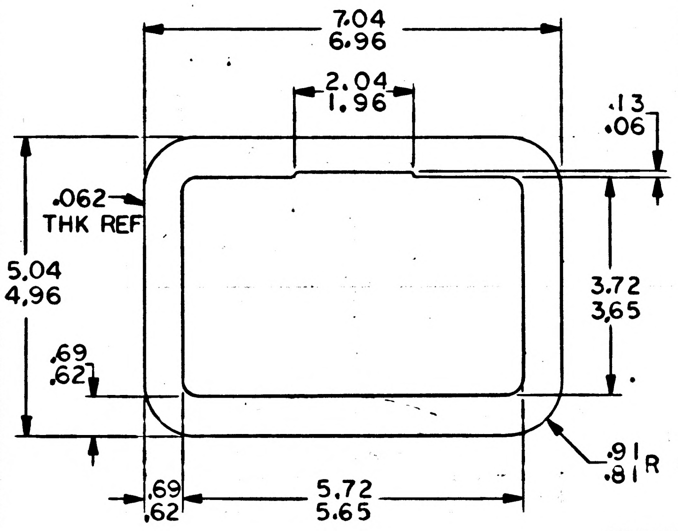
REVISIONS 03584

SYM	DESCRIPTION	DATE	APPROVED
-	~~CLASS B RELEASE PER TDRR~~ 03584		

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

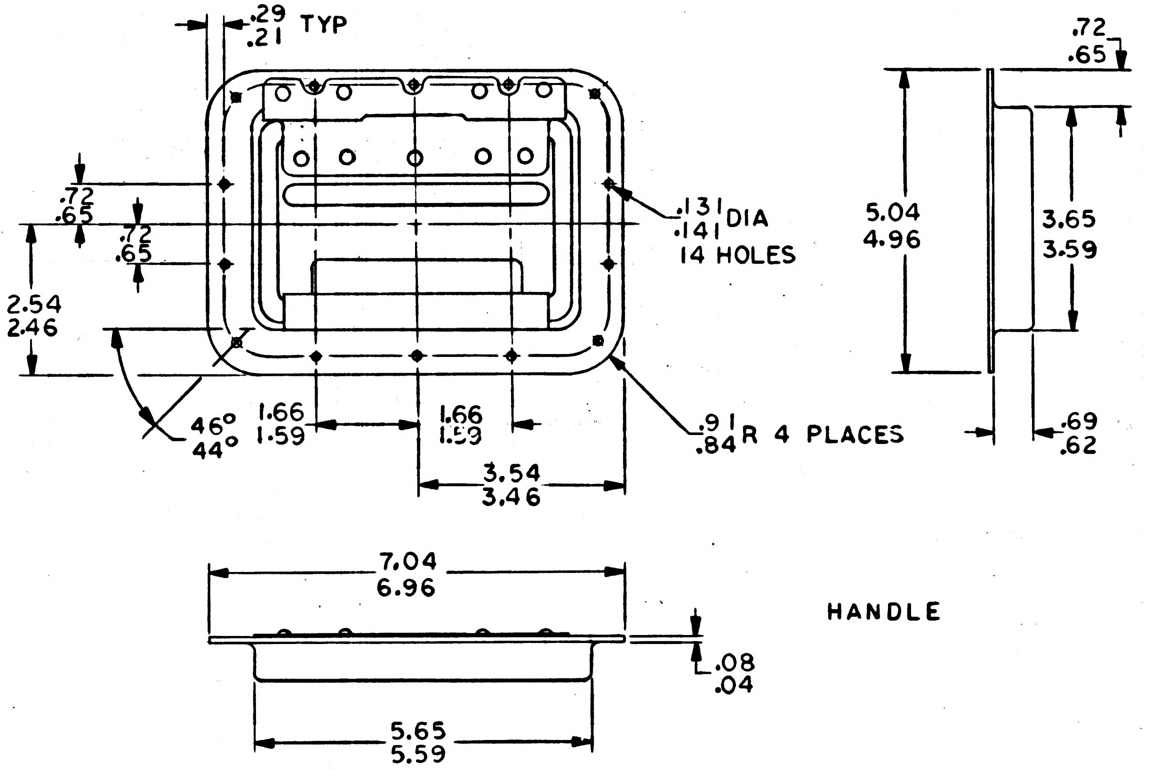
NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND NASA PART NUMBER.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. HANDLE IS SUPPLIED WITH GASKET.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS: (SAMPLE)
   - A. MECHANICAL REQUIREMENTS:
     - (1) ACTION: HANDLE BAIL SHALL LIFT TO A MINIMUM OF 90° FROM AT REST POSITION. A SPRING SHALL RETURN THE BAIL COMPLETELY. THE HANDPIECE SHALL BE NON-METALLIC AND FREE TO TURN ON THE BAIL.
3. DESIGN REQUIREMENTS:
   - A. MATERIAL:
     - (1) PLATE: .064 THK ALUMINUM PER QQ-A-318 (5052-0)
     - (2) BAIL RETAINER: .064 THK STEEL (SAE 1010)
     - (3) BAIL: .312 DIAMETER STEEL WIRE PER QQ-W-461
     - (4) SPRING: .050 DIAMETER CRES WIRE PER QQ-S-766, CLASS 4, COND C (302).
     - (5) HANDPIECE: .529 DIAMETER BLACK PLASTIC PER MIL-I-631, TYPE F, FORM U, GRADE A, CLASS 2.
     - (6) GASKET: RUBBER.
   - B. FINISH:
     - (1) STEEL PARTS: CADMIUM PLATE PER QQ-P-416, TYPE II, CLASS I.
     - (2) ALUMINUM PARTS: CHROMATE FILM PER MIL-C-5541.
   - C. LOAD RATING: 200 POUNDS PER HANDLE.



GASKET

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 63



HANDLE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Tony Wheeler DATE 12 Sept 63
CHECKED J. Ruggiero / W Kinnaird 20 Sept 63
APPROVAL C. Srulin JAK
APPROVAL J. Yuhasz JJB 9/20/63
APPROVAL J. L. Rundstrom RPB 9/20/63
NASA APPROVAL W J Rhine 10-3-63
MIT APPROVAL L. Jediman 10/2/63
MIT APPROVAL W Ruffin 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HANDLE, BAIL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006673
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS 03584			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03584		
A	REVISED PER TDRR 09770 DR CHK J.C. Joubert APPD	4/4/64	KB

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT CODE, DATE OF MANUFACTURE OR CODE, AND THE NASA PART NUMBER. PER MIL-STD-129,
   - B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) SURFACE QUALITY: 250 MICROINCHES MAXIMUM.
     - (2) THREADS: 60° SCREW THREADS PER NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS AS SPECIFIED IN TABLE I.
     - (3) MATERIAL AND FINISH CERTIFICATION: COMPLIANCE WITH MATERIAL AND FINISH REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.
     - (4) MATERIAL: STEEL PER MIL-S-7952, COMPOSITION 1029.
     - (5) FINISH: CADMIUM PLATE PER QQ-P-416, CLASS 2, TYPE II.

DESIGN REQUIREMENTS:

3. DESIGN REQUIREMENTS: L PER MIL-S-7952, COMPOSITION 1020.
   - A. CONSTRUCTION: SOLID (NOT WELDED). 6, CLASS 2, TYPE II.

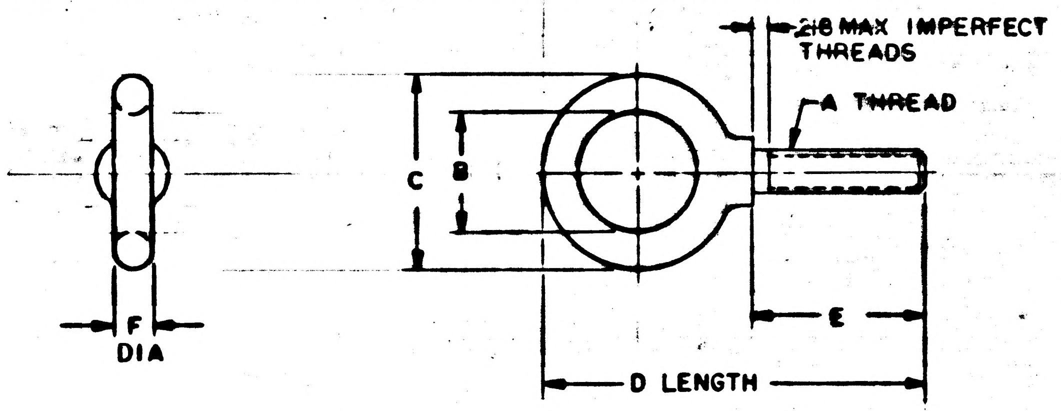
TABLE I

DASH NO.	DIMENSIONS					
	A THREAD SIZE	EYE DIAMETER		LENGTH		F
		B	C	D	E	MIN
-1	1/4-20UNC-2A	.77 .71	1.21 1.17	2.43 2.39	1.02 .98	.20
-2	5/16-18UNC-2A	.90 .84	1.46 1.42	2.83 2.79	1.15 1.10	.26
-3	3/8-16UNC-2A	1.07 .97	1.68 1.64	3.28 3.21	1.27 1.23	.31
-4	7/16-14UNC-2A	1.11 1.06	1.88 1.82	3.65 3.59	1.40 1.35	.36
-5	1/2-13UNC-2A	1.21 1.15	2.10 2.04	4.02 3.95	1.53 1.48	.41
-6	5/8-11UNC-2A	1.40 1.31	2.54 2.48	4.78 4.70	1.79 1.73	.54

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 63



1006674

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE
CHECKED
APPROVAL
APPROVAL 9/20/63
APPROVAL 9/26/63
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BOLT, EYE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006674
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS 03584

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03584		

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
    - A. MARKING: PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT CODE, DATE OF MANUFACTURE OR CODE, AND THE NASA PART NUMBER.
    - B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
    - A. MECHANICAL PROPERTIES:
        - (1) SURFACE QUALITY: 250 MICROINCHES MAXIMUM.
        - (2) THREADS: 60° SCREW THREADS PER NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS AS SPECIFIED IN TABLE I.
        - (3) MATERIAL AND FINISH CERTIFICATION: COMPLIANCE WITH MATERIAL AND FINISH REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.
        - (4) MATERIAL: STEEL PER MIL-S-7952, COMPOSITION 1020.
        - (5) FINISH: CADMIUM PLATE PER QQ-P-416, CLASS 2, TYPE II.

3. DESIGN REQUIREMENTS:
    - A. CONSTRUCTION: SOLID (NOT WELDED).

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 63

TABLE I

DASH NO.	DIMENSIONS					F
	A THREAD SIZE	EYE DIAMETER		LENGTH		
		B	C		E	MIN
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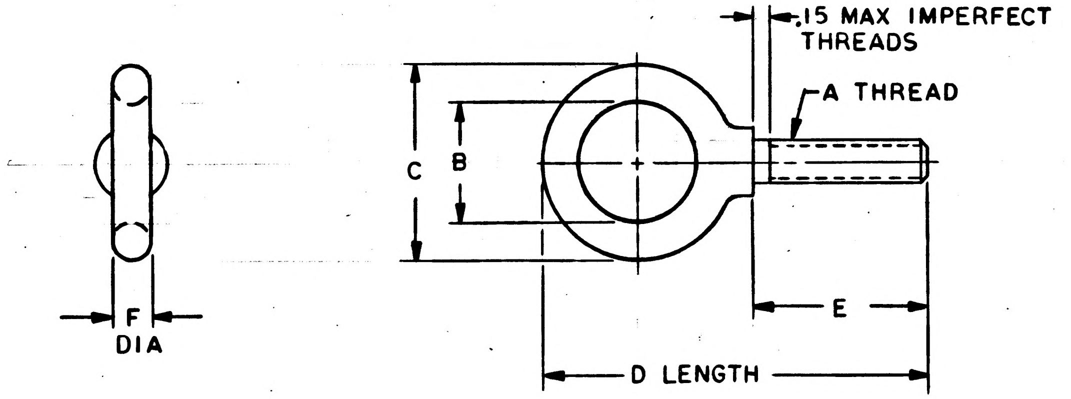
-3	3/8-16UNC-2A	1.02 .98	1.68 1.64	3.25 3.21	1.27 1.23	.31
-4	7/16-14UNC-2A	1.11 1.07	1.86 1.82	3.63 3.59	1.40 1.35	.36
-5	1/2-13UNC-2A	1.21 1.17	2.08 2.04	3.99 3.95	1.52 1.48	.41
-6	5/8-11UNC-2A	1.40 1.35	2.52 2.48	4.38 4.34	1.77 1.73	.54



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Wheeler DATE 10 Sept 63
CHECKED W. Maynard 13 Sept 63
APPROVAL JRK
APPROVAL 9/20/63
APPROVAL RAB 9/20/63
NASA APPROVAL W J Rhine 10-3-63
MIT APPROVAL Gedimon 10/2/63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
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BOLT, EYE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006674
SCALE NONE WT SHEET 1 OF 1

1006674

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04395	5 Nov 63	WK
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 19106 DR H. Wong CHK W Lyons APPD H. Maynard		6-15-65

NOTES:

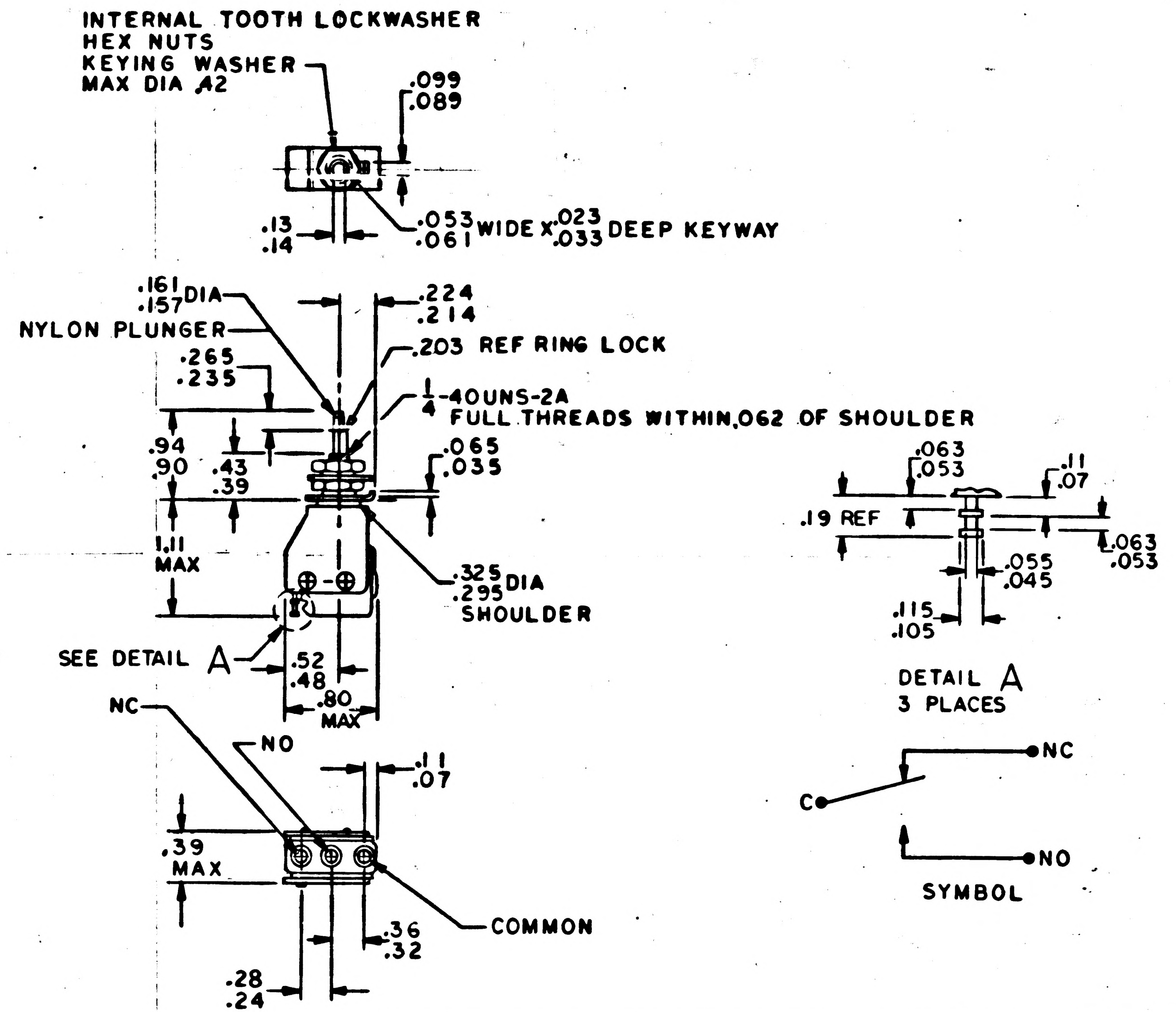
1. GENERAL REQUIREMENTS:
   - A. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-8805, EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS SPECIFIED BELOW.
   - B. SUPPLIERS SHALL CONFORM TO MIL-Q-9858.
   - C. ~~UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002095.~~
   - D. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE TERMINAL IDENTIFICATION. PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE OR DATE CODE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING):
   - A. MECHANICAL REQUIREMENTS:
     - (1) ACTUATING FORCE: 5 ± 2-1/2 OUNCES
     - (2) CONTACT FORM: SPDT
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS
     - (2) CONTACT RESISTANCE: 0.025 OHMS MAX INITIAL RESISTANCE CALCULATED BY THE VOLTAGE DROP METHOD, AT RATED LOAD.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE (MIN): 1 MILLION CYCLES OF MECHANICAL OPERATION AND 25,000 CYCLES OF OPERATION WITH A RESISTIVE LOAD.
   - B. CONSTRUCTION: BASIC SUBMINIATURE SNAP-ACTION SWITCH PERMANENTLY MOUNTED IN A PUSH BUTTON HOLDER. PUSH BUTTON SHAFT MATERIAL, NYLON. HOLDER MATERIAL, 302 CORROSION-RESISTING STEEL. TERMINAL MATERIAL, BRASS ELECTRO-PLATED SOLDER WITH SILVER PLATE UNDERLAY. CONTACT MATERIAL, SILVER.
   - C. TERMINAL STRENGTH: CAPABLE OF WITHSTANDING A 5 POUND MINIMUM AXIAL PULL.
   - D. STRENGTH OF ACTUATOR: 25 POUNDS MINIMUM STEADY LOAD.
   - E. CONTACT RATINGS:
     - (1) 28 VDC
       - RESISTIVE LOAD: 5 AMPERES
       - INDUCTIVE LOAD: 3 AMPERES
     - (2) 125 VRMS, 400 CPS
       - RESISTIVE LOAD: 5 AMPERES
       - INDUCTIVE LOAD: 3 AMPERES
     - (3) MAXIMUM INRUSH: 24 AMPERES
   - F. SHAFT ROTATION: PUSH BUTTON SHAFT SHALL NOT ROTATE MORE THAN 4° TOTAL.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J.H. C. Crespi DATE 4-7-63
CHECKED J. Ruggeri
APPROVAL C. Sperling
APPROVAL [illegible]
APPROVAL J. B. Walsh 10-29-63
NASA APPROVAL [illegible] 14 Feb 63
MIT APPROVAL W. Crafe 5 Nov 63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006677
SCALE NONE
WT
SHEET 1 OF 1

1006677

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04395	5 Nov 63	VK
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 19106 DR H. Wong CHK W Lyons APPD A. Maynard		6-15-65
B	REVISED PER TDRR 22898 DR Ken Bull CHK T D [illegible] APPD [illegible]	21 Oct 65	[illegible]

NOTES:

1. GENERAL REQUIREMENTS:

   A. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-6743, EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS SPECIFIED BELOW.

   B. SUPPLIERS SHALL CONFORM TO MIL-Q-9858.

   C. ~~UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002099.~~

   D. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE TERMINAL IDENTIFICATION. PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE OR DATE CODE, AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER), AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING):

   A. MECHANICAL REQUIREMENTS:

      (1) ACTUATING FORCE: 5 ± 2-1/2 OUNCES

      (2) CONTACT FORM: SPDT

   B. ELECTRICAL CHARACTERISTICS:

      (1) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS

      (2) CONTACT RESISTANCE: 0.025 OHMS MAX INITIAL RESISTANCE CALCULATED BY THE VOLTAGE DROP METHOD, AT RATED LOAD.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE (MIN): 1 MILLION CYCLES OF MECHANICAL OPERATION AND 25,000 CYCLES OF OPERATION WITH A RESISTIVE LOAD.

   B. CONSTRUCTION: BASIC SUBMINIATURE SNAP-ACTION SWITCH PERMANENTLY MOUNTED IN A PUSH BUTTON HOLDER. PUSH BUTTON SHAFT MATERIAL, NYLON. HOLDER MATERIAL, 302 CORROSION-RESISTING STEEL. TERMINAL MATERIAL, BRASS ELECTRO-PLATED SOLDER WITH SILVER PLATE UNDERLAY. CONTACT MATERIAL, SILVER.

   C. TERMINAL STRENGTH: CAPABLE OF WITHSTANDING A 5 POUND MINIMUM AXIAL PULL.

   D. STRENGTH OF ACTUATOR: 25 POUNDS MINIMUM STEADY LOAD.

   E. CONTACT RATINGS:

      (1) 28 VDC
         RESISTIVE LOAD: 5 AMPERES
         INDUCTIVE LOAD: 3 AMPERES

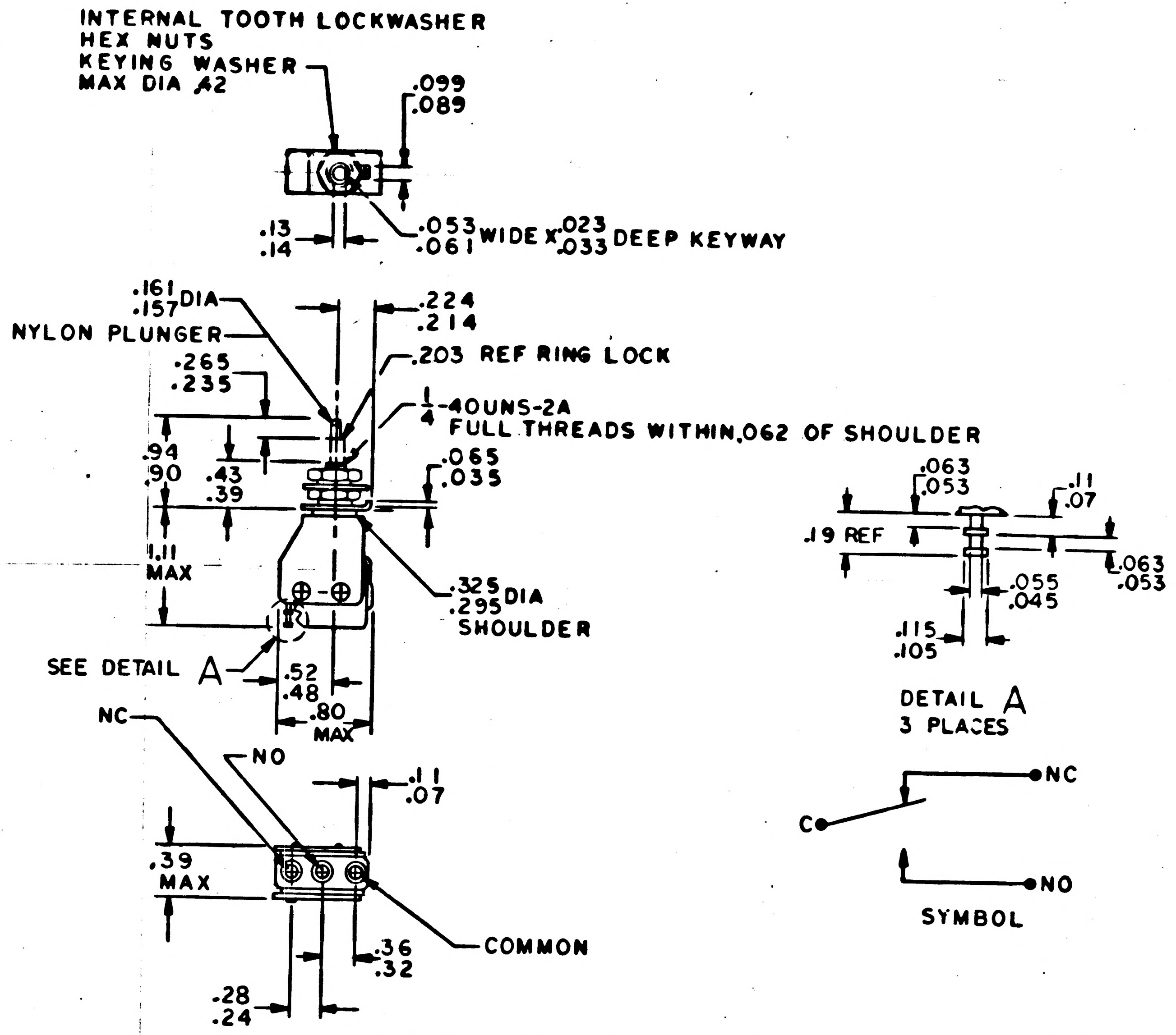
      (2) 125 VRMS, 400 CPS
         RESISTIVE LOAD: 5 AMPERES
         INDUCTIVE LOAD: 3 AMPERES

      (3) MAXIMUM INRUSH: 24 AMPERES

   F. SHAFT ROTATION: PUSH BUTTON SHAFT SHALL NOT ROTATE MORE THAN 4° TOTAL.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



1006677

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Caspi DATE 4-[illegible]-63
CHECKED J. Ruggeri
APPROVAL C. Sanders Jr [illegible]
APPROVAL [illegible]
APPROVAL J. D. [illegible] 10/[illegible]/63
NASA APPROVAL W. J. [illegible] 12 Dec 63
MIT APPROVAL W. [illegible] 5 Nov 63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO 1006677
SCALE NONE
WT
SHEET 1 OF 1

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04395	5Nov63	WR

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FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04395
DATE 11/5/63

NOTES:

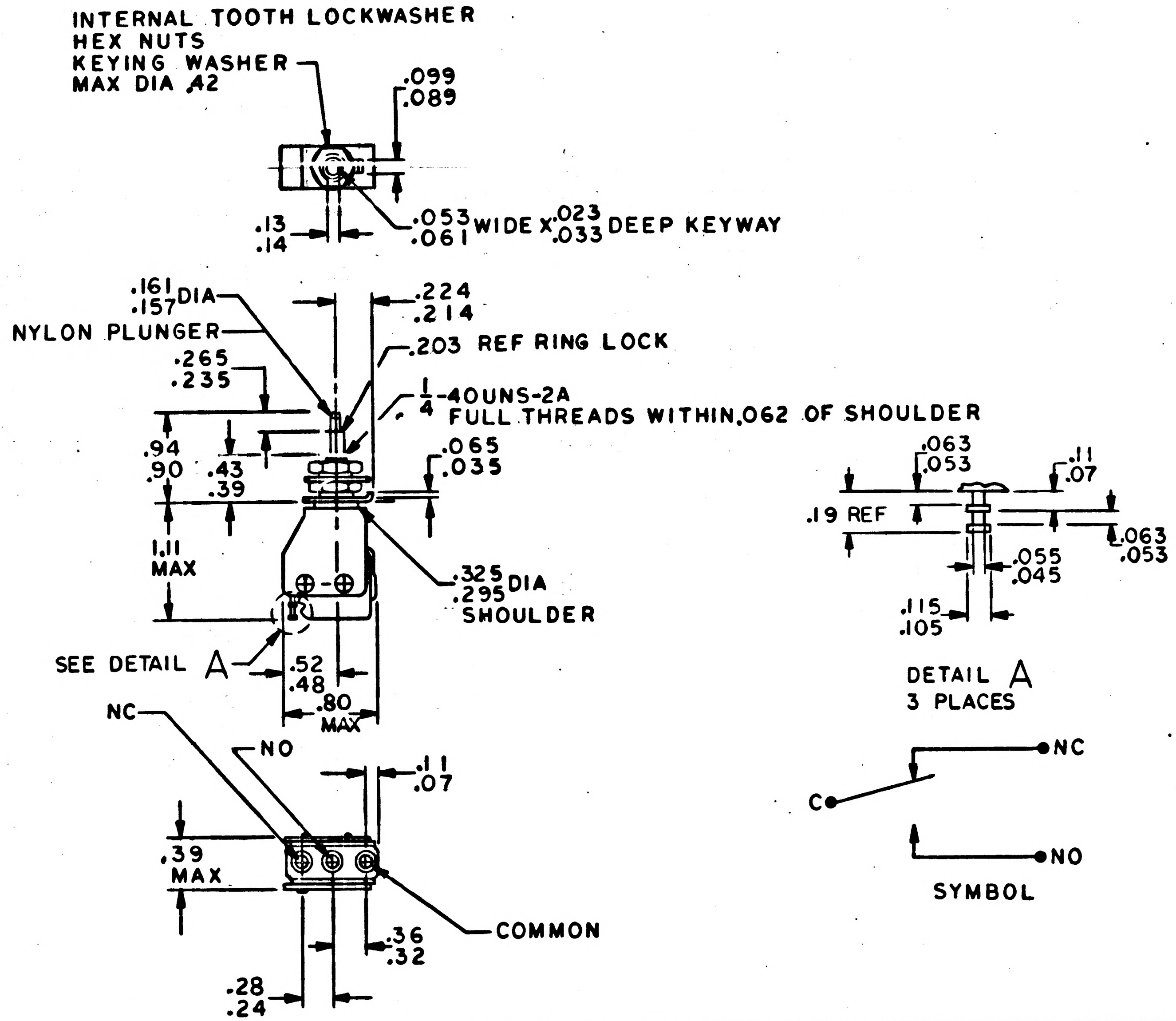
1. GENERAL REQUIREMENTS:
   - A. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-6743, EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS SPECIFIED BELOW.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - D. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE TERMINAL IDENTIFICATION. PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE OR DATE CODE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING):
   - A. MECHANICAL REQUIREMENTS:
     - (1) ACTUATING FORCE: 5 ± 1 OUNCES
     - (2) CONTACT FORM: SPDT
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS, 60 CPS
     - (2) CONTACT VOLTAGE DROP: ONE MILLIVOLT MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VDC IS APPLIED THRU A SUITABLE DROPPING RESISTOR.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE (MIN): 1 MILLION CYCLES OF MECHANICAL OPERATION AND 25,000 CYCLES OF OPERATION WITH A RESISTIVE LOAD.
   - B. CONSTRUCTION: BASIC SUBMINIATURE SNAP-ACTION SWITCH PERMANENTLY MOUNTED IN A PUSH BUTTON HOLDER. PUSH BUTTON SHAFT MATERIAL, NYLON. HOLDER MATERIAL, 302 CORROSION-RESISTING STEEL. TERMINAL MATERIAL, BRASS SUITABLY PLATED FOR SOLDERING. CONTACT MATERIAL, SILVER.
   - C. TERMINAL STRENGTH: CAPABLE OF WITHSTANDING A 5 POUND MINIMUM AXIAL PULL.
   - D. STRENGTH OF ACTUATOR: 25 POUNDS MINIMUM STEADY LOAD.
   - E. CONTACT RATINGS:
     - (1) 28 VDC
       - RESISTIVE LOAD: 5 AMPERES
       - INDUCTIVE LOAD: 3 AMPERES
     - (2) 125 VRMS, 400 CPS
       - RESISTIVE LOAD: 5 AMPERES
       - INDUCTIVE LOAD: 3 AMPERES
     - (3) MAXIMUM INRUSH: 24 AMPERES
   - F. SHAFT ROTATION: PUSH BUTTON SHAFT SHALL NOT ROTATE MORE THAN ± 2°.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

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LEXINGTON, MASS.
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APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 5Nov63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006677
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS 03584

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03584		WK
A	REVISED PER TDRR 05670 DR RD Sullivan CHK NQA APPD A Maynard		WK

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH NASA DRAWING NUMBER AND REVISION LETTER. INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY OF PARTS ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

3. DESIGN:

A. MATERIAL: BODY - MOLDED, BLACK, CELLULOSE FILLED PHENOLIC COMPOUND, TYPE CFG PER MIL-M-14.

SCREWS - BRASS PER QQ-W-321 OR QQ-B-627, NICKEL PLATED PER QQ-N-290.

INSERT - BRASS PER QQ-B-613 OR QQ-B-626, NICKEL PLATED PER QQ-N-290.

B. ELECTRICAL CHARACTERISTICS:

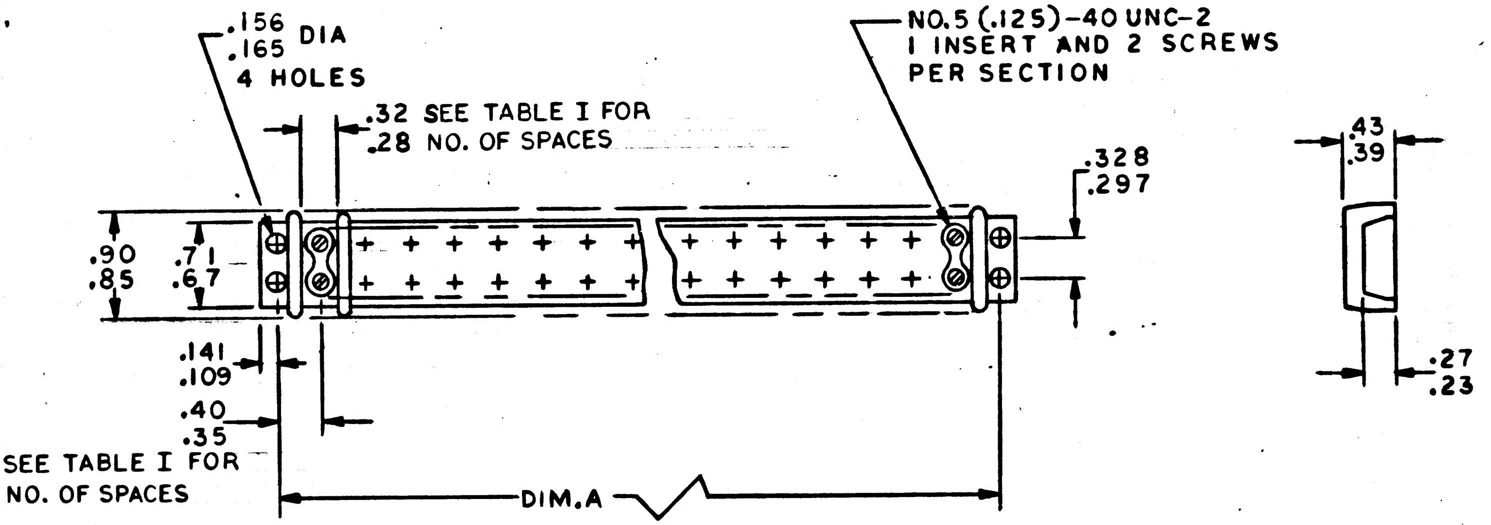
(1) VOLTAGE RATING: 1100 VOLTS RMS MAX.

(2) CURRENT RATING: 15 AMPERES MAXIMUM.

TABLE I

DASH NO.	DIM A	NO. OF SPACES
-1	8.266 8.234	22
-2	6.016 5.984	16

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 1963



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION	

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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J.D.C. Crasp DATE 11 Sep 63
CHECKED J. Ruggeri / A. Maynard
APPROVAL C. Girli
APPROVAL J. Yelnick 9/20/63
APPROVAL J. Rundstrom 9/20/63
NASA APPROVAL 10-2-63
MIT APPROVAL L. Tedman 10/2/63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL BOARD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006678
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS 03584			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03584		WK
A	REVISED PER TDRR 05670 DR R.D. Sullivan CHK MA APPD A. Maynard		WK
B	REVISED PER TDRR 08117 DR R. Truchetto CHK J.G.C. APPD A. Maynard	11 MAY 64	KEB

TABLE I

DASH NO.	DIM A	NO. OF SECTIONS
-1	8.266 8.234	21
-2	6.016 5.984	15

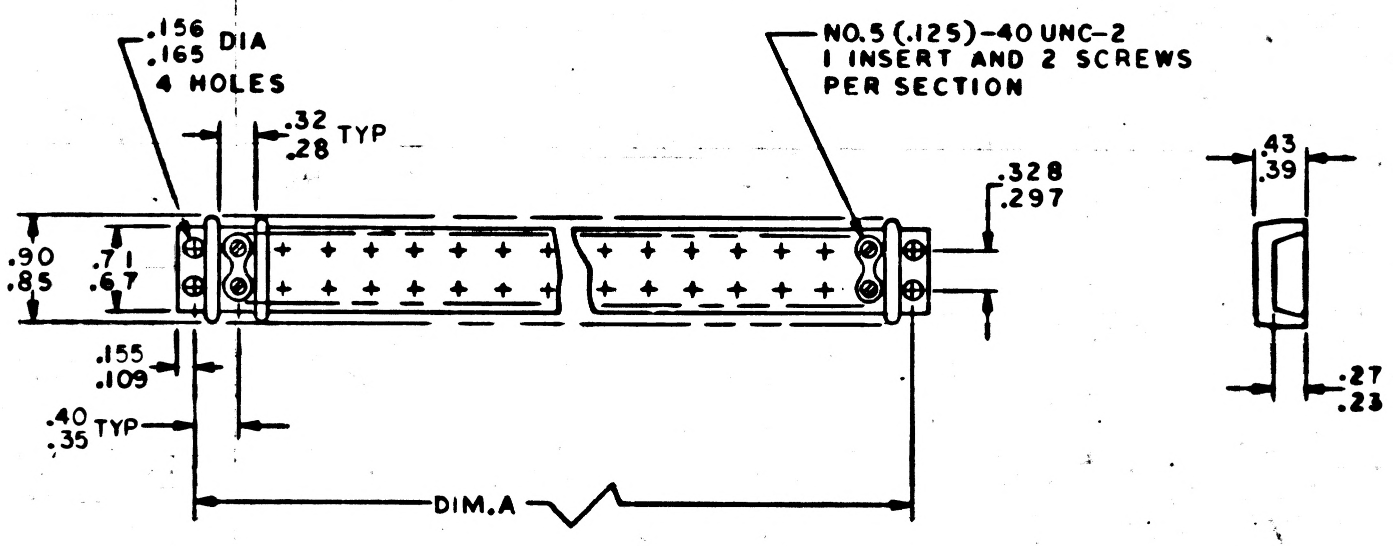
REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH NASA DRAWING NUMBER AND REVISION LETTER. INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY OF PARTS ENCLOSED.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.

3. DESIGN:
   - A. MATERIAL: BODY - MOLDED, BLACK, CELLULOSE FILLED PHENOLIC COMPOUND, TYPE CFG PER MIL-M-14.
     SCREWS - BRASS PER QQ-W-321 OR QQ-B-626, NICKEL PLATED PER QQ-N-290.
     INSERT - BRASS PER QQ-B-613 OR QQ-B-626, NICKEL PLATED PER QQ-N-290.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) VOLTAGE RATING: 1100 VOLTS RMS MAX.
     - (2) CURRENT RATING: 15 AMPERES MAXIMUM.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 1963



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J.D.C. Crap DATE 11 Sept 63
CHECKED J. Ruggeri / A. Maynard 18 Sept 63
APPROVAL
APPROVAL J. Yakaitis JJ 9/20/63
APPROVAL 9/24/63
NASA APPROVAL
MIT APPROVAL L. Jedmans 10/2/63
MIT APPROVAL 3 Oct 63

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TERMINAL BOARD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006678
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS 03584			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03584		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH NASA DRAWING NUMBER AND REVISION LETTER. INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY OF PARTS ENCLOSED.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 1963

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

[illegible]

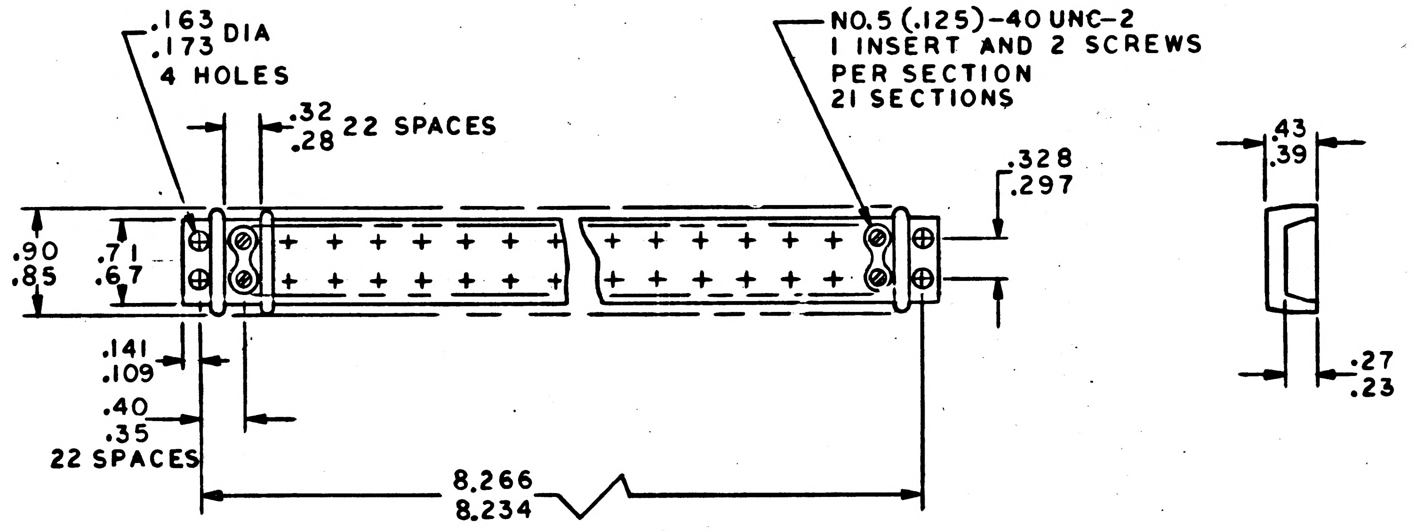
3. DESIGN:

A. MATERIAL: BODY - MOLDED, BLACK, CELLULOSE FILLED PHENOLIC COMPOUND, TYPE CFG PER MIL-M-14.
INSERT AND SCREWS - BRASS PER QQ-W-321, NICKEL PLATED PER QQ-N-290.

B. ELECTRICAL CHARACTERISTICS:

(1) VOLTAGE RATING: 1100 VOLTS RMS MAX.

(2) CURRENT RATING: 15 AMPERES MAXIMUM.



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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 6 Sept 63
CHECKED J. Ruggiero 13 Sept 63
APPROVAL
APPROVAL 9/20/63
APPROVAL 9/20/63
NASA APPROVAL 10-2-63
MIT APPROVAL 10/2/63
MIT APPROVAL 3 Oct 63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006678
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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DASH NO.	FLAT ANGLE A	ADJ STOP TO POSITIONS	NO. OF DECKS
-1	80°30' 84°30'	14	1
-2	73°30' 77°30'	15	1

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	CLASS II CHANGE PER RD-R5630A DR J.P. CHK APPD	1-17-64	
B	REVISED PER TDRR 07532 DR Ken Bull CHK Wolkowicz APPD A.J. Marinaro	4-14-64	HEB

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04303 DATE 10/30/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-3786A AND THE ADDITIONS OR EXCEPTIONS SPECIFIED BELOW.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER AND REVISION LETTER.

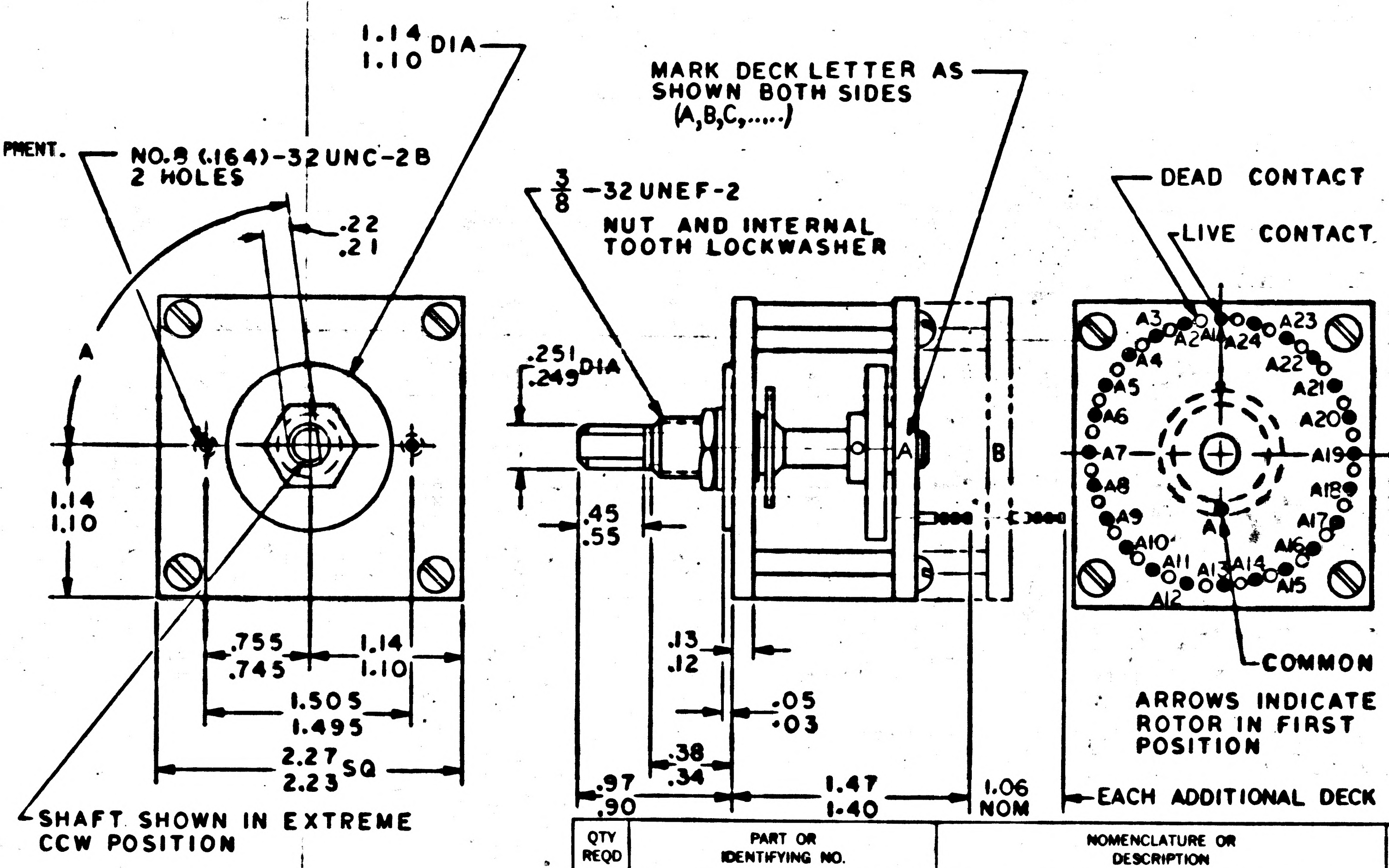
     NOTE: DECK LETTERS SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM SHAFT END.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING)
   - A. MECHANICAL REQUIREMENTS:
     - (1) TORQUE, SWITCHING: BETWEEN 20 AND 80 OUNCE-INCHES.
     - (2) TORQUE, STOP STRENGTH: 20 POUND-INCHES MINIMUM.
     - (3) TERMINALS SHALL ACCOMODATE TWO NO. 20 AWG STRANDED CONDUCTORS.
   - B. CERTIFICATION: MATERIAL AND FINISH SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - C. ELECTRICAL CHARACTERISTICS:
     - (1) CONTACT RESISTANCE: 4 MILLIOHMS NOMINAL, 10 MILLIOHMS INITIAL MAXIMUM AT 100 MILLIAMPERES AND 2 VDC APPLIED THRU A SUITABLE DROPPING RESISTOR.
     - (2) CONTACT CAPACITANCE: 2.5 PICOFARADS MAXIMUM CONTACT TO CONTACT AND CONTACT TO SLIP RING.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT, BUSHING, OR PANEL. 1500 VRMS MINIMUM.
     - (4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 10,000 CYCLES OF ROTATION MINIMUM AT A TEMPERATURE RANGE OF -65°C TO +85°C.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT EXCEEDING INSPECTION REQUIREMENTS.
   - C. CONSTRUCTION:
     - (1) FORM OF CONTACTS: NON-SHORTING, SINGLE POLE/DECK, 24 POSITIONS, 15° INDEX, ROTATION LIMITED BY ONE ADJUSTABLE STOP.
     - (2) WIPER BLADES: MULTILEAF TYPE.
     - (3) CONTACT AREA: TREATED WITH A HIGH MOLE ESTER LUBRICANT
     - (4) TERMINAL MATERIAL: SILVER ALLOY (90 Ag-10Cu), GOLD FLASHED.
     - (5) TERMINAL STRENGTH: 5 POUND AXIAL NO-SHOCK LOAD FOR 10 SECONDS.
     - (6) PANEL MATERIAL: ALUMINUM ALLOY (2024-T3) PER QQ-A-355. ANODIZED PER MIL-A-8625, TYPE I.
     - (7) TERMINAL BOARD MATERIAL: PAPER BASE EPOXY PER MIL-P-22324, TYPE PEE.
   - D. RATINGS:
     - (1) CONTACT CURRENT RATING:

       BREAKING: 2 AMPERES MAXIMUM FOR A RESISTIVE LOAD AT 115 VRMS.

       CONTINUOUS (NON-BREAKING): 10 AMPERES MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 23 Sep 63
CHECKED D. Ruggeri / W. Maynard
APPROVAL C. Sperling
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 30 Oct 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
24 POSITIONS/POLE, 1 POLE/DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006679
SCALE NONE
WT
SHEET 1 OF 1

1006679 B

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
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DASH NO.	FLAT ANGLE A	ADJ STOP TO POSITIONS	NO. OF DECKS
-1	80°30' 84°30'	14	1

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04303 DATE 10/30/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-3786A AND THE ADDITIONS OR EXCEPTIONS SPECIFIED BELOW.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER AND REVISION LETTER.

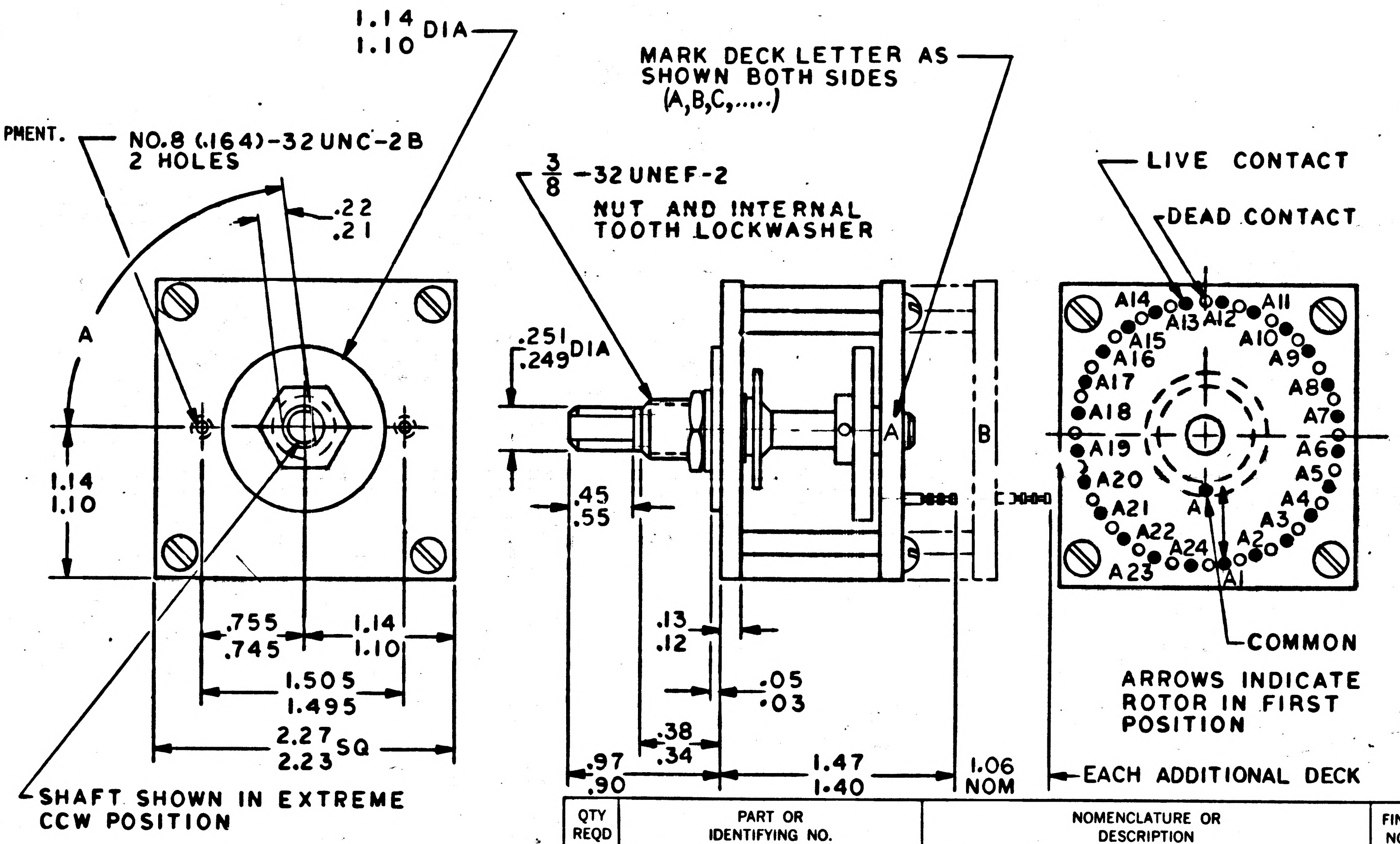
     NOTE: DECK LETTER SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM SHAFT END.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING)
   - A. MECHANICAL REQUIREMENTS:
     - (1) TORQUE, SWITCHING: BETWEEN 20 AND 80 OUNCE-INCHES.
     - (2) TORQUE, STOP STRENGTH: 50 POUND-INCHES MINIMUM.
     - (3) TERMINALS SHALL ACCOMODATE TWO NO. 20 AWG STRANDED CONDUCTORS.
   - B. CERTIFICATION: MATERIAL AND FINISH SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - C. ELECTRICAL CHARACTERISTICS:
     - (1) CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES AND 2 VDC APPLIED THRU A SUITABLE DROPPING RESISTOR.
     - (2) CONTACT CAPACITANCE: 2.5 PICOFARADS MAXIMUM CONTACT TO CONTACT AND CONTACT TO SLIP RING.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: BETWEEN CURRENT CARRYING PARTS AND BETWEEN CURRENT CARRYING PARTS AND THE SHAFT, BUSHING, OR PANEL. 1500 VRMS MINIMUM.
     - (4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 25,000 CYCLES OF ROTATION MINIMUM AT A TEMPERATURE RANGE OF -65°C TO +85°C.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT EXCEEDING INSPECTION REQUIREMENTS.
   - C. CONSTRUCTION:
     - (1) FORM OF CONTACTS: NON-SHORTING, SINGLE POLE/DECK, 24 POSITIONS; 15° INDEX, ROTATION LIMITED BY ONE ADJUSTABLE STOP.
     - (2) WIPER BLADES: MULTILEAF TYPE.
     - (3) CONTACT AREA: TREATED WITH A LITHIUM BASE GREASE.
     - (4) TERMINAL MATERIAL: SILVER ALLOY (90 Ag-10Cu), GOLD PLATED.
     - (5) TERMINAL STRENGTH: 5 POUND AXIAL NO-SHOCK LOAD FOR 10 SECONDS.
     - (6) PANEL MATERIAL: ALUMINUM ALLOY (2024-T3) PER QQ-A-355. ANODIZED PER MIL-A-8625, TYPE I.
     - (7) TERMINAL BOARD MATERIAL: PAPER BASE EPOXY PER MIL-P-22324, TYPE PEE.
   - D. RATINGS:
     - (1) CONTACT CURRENT RATING:

       BREAKING: 2 AMPERES MAXIMUM FOR A RESISTIVE LOAD AT 115 VRMS.

       CONTINUOUS (NON-BREAKING): 10 AMPERES MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DMP C. Cooper DATE 23 Sep 63
CHECKED J. Ruggieri / W. Maynard 26 Sep 63
APPROVAL C Sparling JPK
APPROVAL A. Dempsey JJS
APPROVAL J. D. 10/1/63
NASA APPROVAL 10/31/63
MIT APPROVAL W Kupfer 30 Oct 63
MIT APPROVAL 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
24 POSITIONS/POLE, 1 POLE/DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006679
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	REVISED PER. TDRR 12323 DR R Fuelets CHK RT. Dronincko APPD H Maynard	9/25/64	K E63

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND TERMINAL IDENTIFICATION ON BOTH SIDES. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, QUANTITY ENCLOSED, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      (1) DIMENSIONS: SEE SKETCH.

3. DESIGN:

   A. MATERIAL:

      BODY - DIALLYL PHTHALATE, GLASS FILLED PER MIL-M-19833, TYPE G.D.1. - 30.

      PIN CONTACTS - BRASS, GOLD PLATED PER MIL-G-45204, TYPE I, CLASS 2 OVER .0002 THICK SILVER PLATE PER QQ-S-365, TYPE I.

      HOOD - ALUMINUM, 5052-H32 PER QQ-A-318 ANODIZED PER MIL-A-8625.

      KNOBS - COLD ROLLED STEEL, CADMIUM PLATED PER QQ-P-416, TYPE II, CLASS 2.

      SCREWLOCK - CORROSION-RESISTANT STEEL IN ACCORDANCE WITH QQ-S-763, CLASS 303, CONDITION A, PASSIVATED IN ACCORDANCE WITH MIL-F-14072, METHOD E300.

   B. VOLTAGE RATING:

      SEA LEVEL - 1.8 K TO 2.5 K VDC.

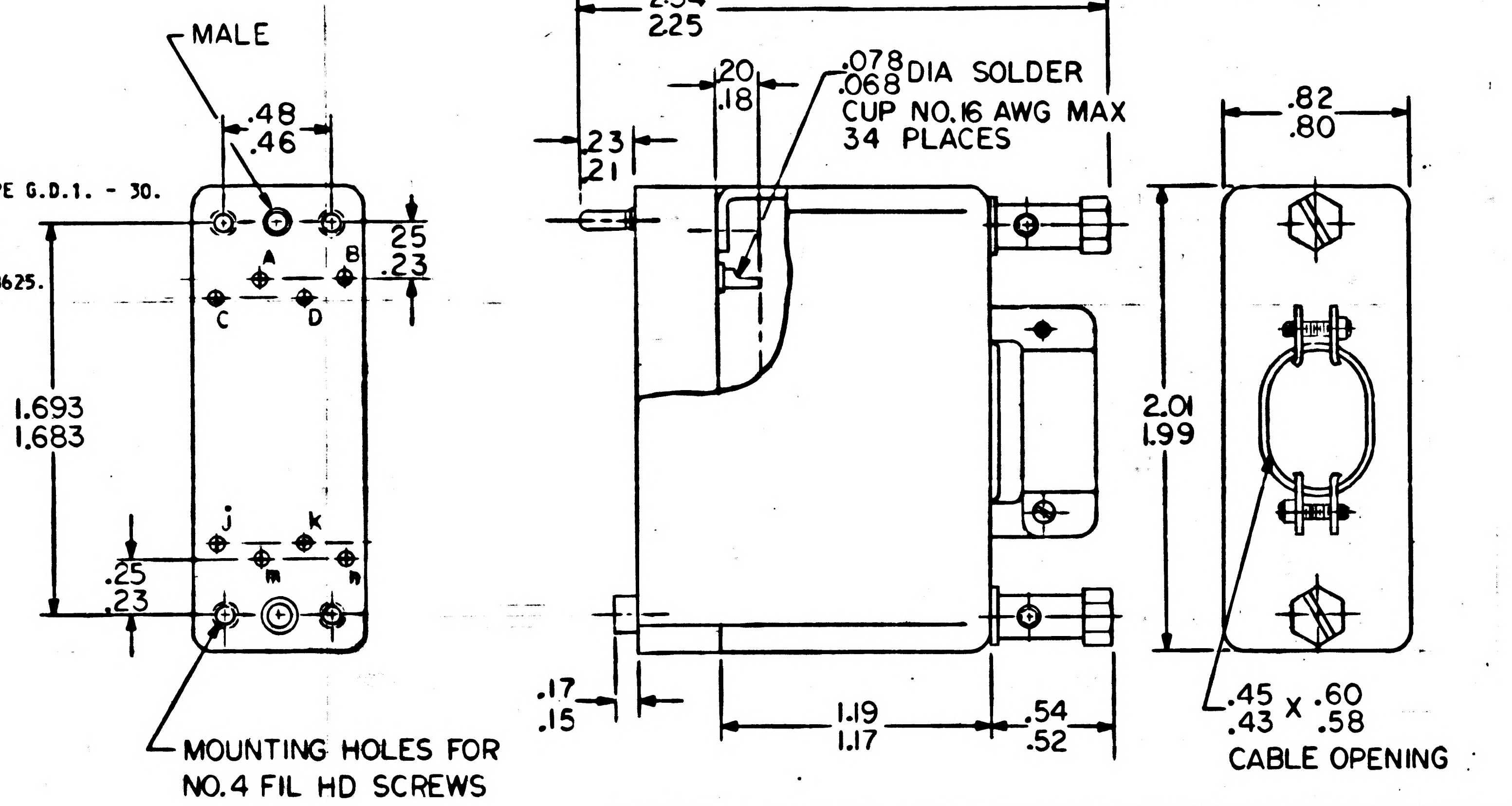
      60,000 FT ALTITUDE - 500 VRMS - 700 VDC

   C. CURRENT RATING: 10 AMPERES CONTINUOUS 13 AMPERES MAXIMUM FOR SHORT DURATION.

   D. INSULATION RESISTANCE 1000 MEGOHMS, MINIMUM.

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 04323 DATE 10/30/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT:
FINAL FINISH: SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN J. Leonard JP DATE 9 Oct 63
CHECKED J. Ruggen / H Maynard
APPROVAL C Sperling JPK
APPROVAL
APPROVAL J. E. Walsh 10/21/63
NASA APPROVAL
MIT APPROVAL W Kupfer 30 Oct 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
34 CONTACTS (FEMALE) WITH HOOD
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006680
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006680

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER AND TERMINAL IDENTIFICATION ON BOTH SIDES. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, QUANTITY ENCLOSED, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: SEE SKETCH.

3. DESIGN:

A. MATERIAL:

BODY - DIALLYL PHTHALATE, GLASS FILLED PER MIL-M-19833, TYPE G.D.1. - 30.

PIN CONTACTS - BRASS, GOLD PLATED PER MIL-G-45204, TYPE I, CLASS 2 OVER .0002 THICK SILVER PLATE PER QQ-S-365, TYPE I.

HOOD AND SCREWLOCK - CORROSION-RESISTANT STEEL IN ACCORDANCE WITH QQ-S-763, CLASS 303, CONDITION A, PASSIVATED IN ACCORDANCE WITH MIL-F-14072, METHOD E300.

B. VOLTAGE RATING:

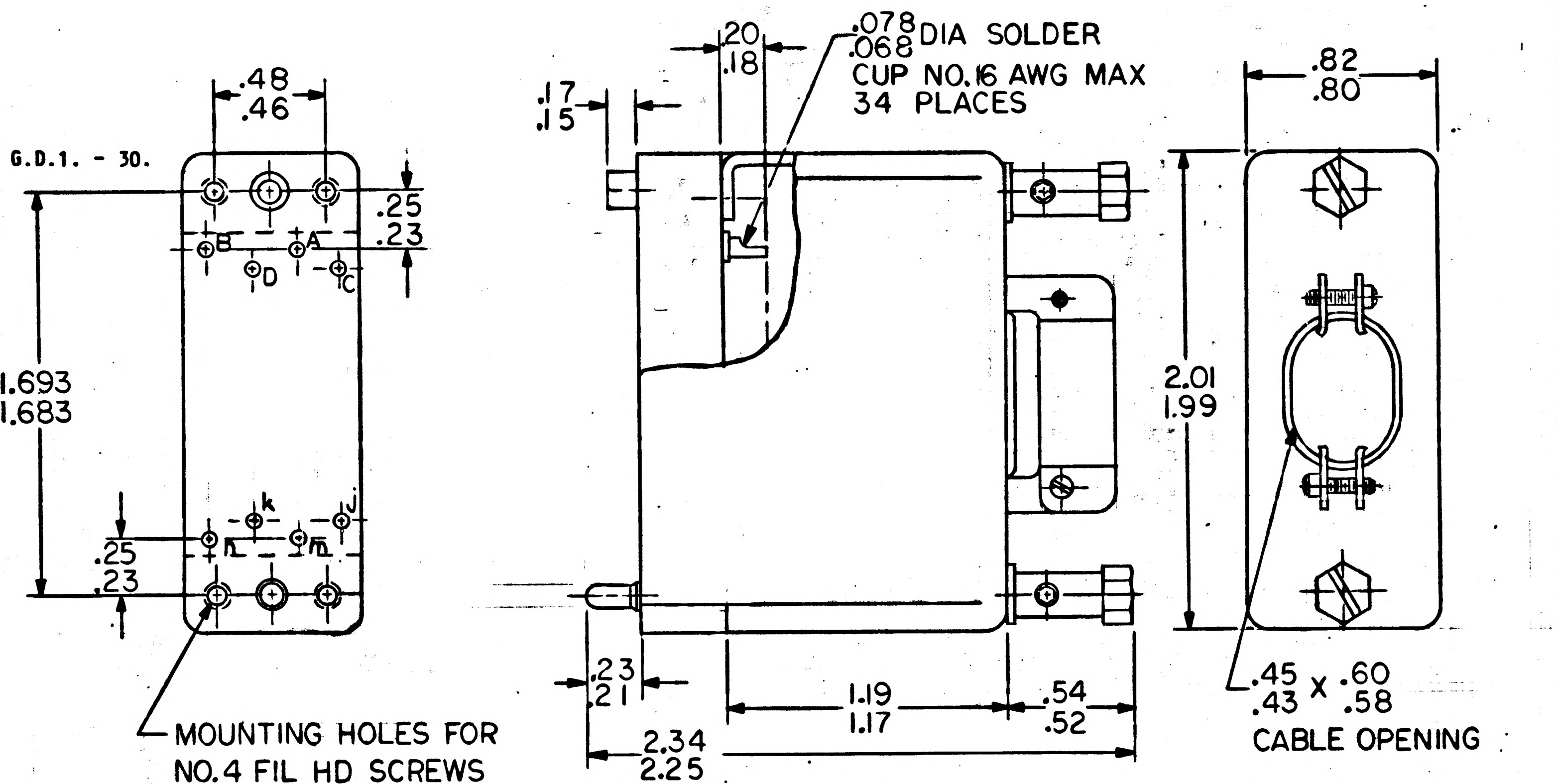
SEA LEVEL - 1.8 K TO 2.5 K VDC.

60,000 FT ALTITUDE - 500 VRMS - 700 VDC

C. CURRENT RATING: 10 AMPERES CONTINUOUS, 13 AMPERES MAXIMUM FOR SHORT DURATION.

D. INSULATION RESISTANCE 1000 MEGOHMS, MINIMUM.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04303 DATE 10/30/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J. Leonard DATE 4 Oct 63
CHECKED J. Ruggeri / H. Maynard 10 Oct 63
APPROVAL C. Sperling
APPROVAL
APPROVAL J. D. Walsh 10/21/63
NASA APPROVAL
MIT APPROVAL 30 Oct 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG
34 CONTACTS (FEMALE) WITH HOOD
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006680
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006680

INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
Ⓜ -	CLASS B RELEASE PER TDRR		
A	REVISION STATUS CHANGED PER TDRR 09774 DR G.A. Bishop CHK J.C. Jankut APPD H Maynard	4/15/64	KCB Ⓜ

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: PER TABLE II.

(2) COLOR: SEE TABLE I AND NOTE.

(3) CERTIFICATION OF MATERIAL SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. MATERIAL: CONTACT AND LUG - BERYLLIUM COPPER ALLOY PER QQ-C-530, CONDITION H, GOLD PLATED PER MIL-G-45204, TYPE II, CLASS 2, SILVER STRIKE.

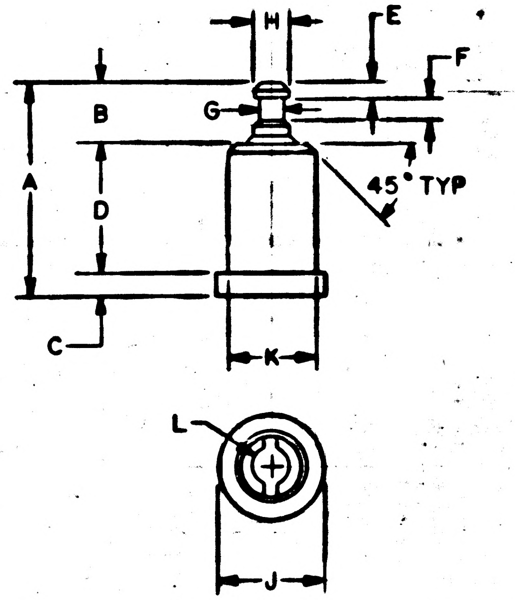
INSULATOR - POLYTETRAFLUOROETHYLENE (TEFLON) PER MIL-T-14078.

B. VOLTAGE RATING: SEE TABLE II.

C. FLASHOVER VOLTAGE: SEE TABLE II.

D. CAPACITANCE: SEE TABLE II.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04305 DATE 10/30/63



A	A
—	—
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 20 Sept 63
CHECKED J. Russo / W. Maynard
APPROVAL
APPROVAL
APPROVAL 10/21/63
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 10/23/63

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JACK TIP, PRESS FIT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006681
SCALE NONE	WT	SHEET 1 OF 2

1006681

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	REVISED PER TDRR 09774 DR CHK J. C. APPD Maynard	4/1/64	KCB

TABLE I

COLOR	PREFIX TO DASH NO.
WHITE	A
GRAY	B
VIOLET	C
BLUE	D
GREEN	E
YELLOW	F
ORANGE	G
RED	H
BROWN	J
BLACK	K

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 01305 DATE 10/30/63

TABLE II

DASH NO.	VOLTAGE, RMS, 60 CPS			MAXIMUM CAPACITANCE UUF	DIMENSIONS										
	MINIMUM NOMINAL RATING	MINIMUM FLASHOVER SEA LEVEL	MINIMUM FLASHOVER 50,000 FEET		A REF	B REF	C	D	E MIN	F	G	H DIA	J DIA	K DIA	L DIA
-1	1000	3000	1500	0.7	.48	.12	.06 .04	.28 .26	.03	.06 .04	.06 .04	.08 .06	.223 .213	.186 .184	.085 .095
-2	1000	3000	1500	0.6	.44	.12	.06 .04	.28 .26	.01	.06 .04	.06 .04	.08 .06	.255 .245	.205 .203	.075 .085
-3	1000	3000	1500	0.6	.44	.12	.06 .04	.28 .26	.03	.06 .04	.06 .04	.08 .06	.223 .213	.186 .184	.075 .085
-4	1200	3500	2000	0.7	.64	.19	.06 .04	.41 .39	.03	.11 .09	.06 .04	.08 .06	.223 .213	.186 .184	.075 .085
-5	1000	3500	1500	0.7	.38	.06	.06 .04	.28 .26	.01	.05 .03	.06 .04	.09 .07	.223 .213	.172 .170	.085 .095
-6	1250	4500	1500	0.4	.20	.06	-	.15 .13	.01	.05 .03	.06 .04	.09 .07	.145 .135	.145 .135	.035 .045
-7	1250	4500	1500	0.4	.20	.06	-	.15 .13	.01	.05 .03	.06 .04	.09 .07	.125 .115	.125 .115	.035 .045
-8	750	3000	1300	0.35	.35	.12	.06 .04	.19 .17	.02	.09 .07	.05 .03	.07 .05	.177 .167	.150 .148	.035 .045
-9	1200	3500	1500	0.6	.40	.06	.06 .04	.30 .28	.01	.05 .03	.08 .06	.11 .09	.255 .245	.220 .218	.100 .110
-10	750	3000	1300	0.2	.45	.12	.06 .04	.29 .27	.01	.07 .05	.05 .03	.07 .05	.147 .137	.122 .120	.035 .045
-11	750	3000	1300	0.8	.76	.19	.20 .18	.40 .38	.03	.13 .11	.06 .04	.08 .06	.223 .213	.202 .200	.088 .098

NOTE: THE COMPLETE NASA NUMBER FOR EACH PART SHALL CONSIST OF THE DRAWING NUMBER, A LETTER PREFIX TO THE DASH NUMBER, INDICATING THE COLOR PER TABLE I, AND THE DASH NUMBER INDICATING DIMENSIONS PER TABLE II. EXAMPLE: 1006681-B3 IS A JACK, GRAY IN COLOR AND HAVING DIMENSIONS PER DASH NUMBER 3 IN TABLE II.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 10 OCT 63
CHECKED
APPROVAL
APPROVAL
APPROVAL 10/21/63
NASA APPROVAL 10/31/63
MIT APPROVAL W Kupfer 30 Oct 63
MIT APPROVAL 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

JACK TIP, PRESS FIT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006681
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

REQUIREMENTS:

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2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: PER TABLE II.

(2) COLOR: SEE TABLE I AND NOTE.

(3) CERTIFICATION OF MATERIAL SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. MATERIAL: CONTACT AND LUG - BERYLLIUM COPPER ALLOY PER QQ-C-530, CONDITION H, GOLD PLATED PER MIL-G-45204, TYPE II, CLASS 2, SILVER STRIKE.

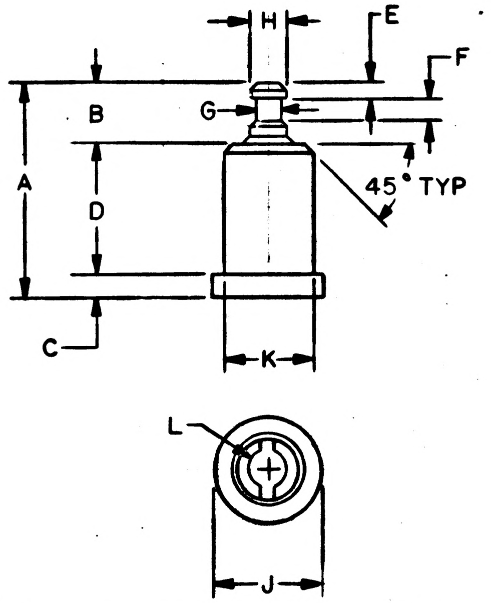
INSULATOR - POLYTETRAFLUOROETHYLENE (TEFLON) PER MIL-T-14078.

B. VOLTAGE RATING: SEE TABLE II.

C. FLASHOVER VOLTAGE: SEE TABLE II.

D. CAPACITANCE: SEE TABLE II.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04305 DATE 10/30/63



—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 19 Sept 63
CHECKED 20 Sept 63
APPROVAL
APPROVAL
APPROVAL 10/21/63
NASA APPROVAL
MIT APPROVAL 30 Oct 63
MIT APPROVAL 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

JACK TIP, PRESS FIT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006681
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

TABLE I

COLOR	PREFIX TO DASH NO.
WHITE	A
GRAY	B
VIOLET	C
BLUE	D
GREEN	E
YELLOW	F
ORANGE	G
RED	H
BROWN	J
BLACK	K

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO 04305 DATE 10/30/63

TABLE II

DASH NO.	VOLTAGE, RMS, 60 CPS			MAXIMUM CAPACITANCE UUF	DIMENSIONS										
	MINIMUM NOMINAL RATING	MINIMUM FLASHOVER SEA LEVEL	MINIMUM FLASHOVER 50,000 FEET		A REF	B REF	C	D	E MIN	F	G	H DIA	J DIA	K DIA	L DIA
-1	1250	4500	1500	0.4	.44	.12	.06 .04	.28 .26	.03	.06 .04	.06 .04	.08 .06	.223 .213	.186 .184	.085 .095
-2	1250	4500	1500	0.3	.44	.12	.06 .04	.28 .26	.03	.06 .04	.06 .04	.08 .06	.255 .245	.205 .203	.075 .085
-3	1250	4500	1500	0.4	.44	.12	.06 .04	.28 .26	.03	.06 .04	.06 .04	.08 .06	.223 .213	.186 .184	.075 .085
-4	2500	6000	2000	0.4	.64	.19	.06 .04	.41 .39	.03	.11 .09	.06 .04	.08 .06	.223 .213	.186 .184	.075 .085
-5	1250	4500	1500	0.4	.38	.06	.06 .04	.28 .26	.01	.05 .03	.06 .04	.09 .07	.223 .213	.172 .170	.085 .095
-6	1250	4500	1500	0.4	.20	.06	-	.15 .13	.01	.05 .03	.06 .04	.09 .07	.145 .135	.145 .135	.035 .045
-7	1250	4500	1500	0.4	.20	.06	-	.15 .13	.01	.05 .03	.06 .04	.09 .07	.125 .115	.125 .115	.035 .045
-8	750	3000	1300	0.55	.35	.12	.06 .04	.19 .17	.02	.09 .07	.05 .03	.07 .05	.177 .167	.150 .148	.035 .045
-9	1250	4500	1500	0.3	.40	.06	.06 .04	.30 .28	.01	.05 .03	.08 .06	.11 .09	.255 .245	.220 .218	.100 .110
-10	750	3000	1300	0.5	.45	.12	.06 .04	.29 .27	.03	.07 .05	.05 .03	.07 .05	.147 .137	.122 .120	.035 .045
-11	750	3000	1300	0.5	.76	.19	.20 .18	.40 .38	.03	.13 .11	.06 .04	.08 .06	.223 .213	.202 .200	.088 .098

NOTE: THE COMPLETE NASA NUMBER FOR EACH PART SHALL CONSIST OF THE DRAWING NUMBER, A LETTER PREFIX TO THE DASH NUMBER, INDICATING THE COLOR PER TABLE I, AND THE DASH NUMBER INDICATING DIMENSIONS PER TABLE II. EXAMPLE: 1006681-B3 IS A JACK, GRAY IN COLOR AND HAVING DIMENSIONS PER DASH NUMBER 3 IN TABLE II.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S. Chifici DATE 10 OCT 63
CHECKED J. Piggani
APPROVAL J. Bechuzy
APPROVAL
APPROVAL J. D. Walsh 10/21/63
NASA APPROVAL 10/30/63
MIT APPROVAL W Kupfer 30 Oct 63
MIT APPROVAL 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

JACK TIP, PRESS FIT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006681
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	UPGRADED TO CLASS A WITH CHANGES PER TDRR 06956 DR L. J. Shaw CHK J. Wolkowicz APPD H. Maynard	3/17/64	WK

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE AND EXPIRATION DATE, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. PROPERTIES:

(1) COLOR: RED

(2) VISCOSITY: 50,000 CENTIPOISES MAXIMUM MEASURED ON A BROOKFIELD VISCOMETER, NO. 4 SPINDLE, 2 RPM. AT 25°C ± 2°C.

(3) THIS MATERIAL SHALL BE PURCHASED IN KIT FORM CONTAINING UNCATALYZED SILICONE RUBBER AND CATALYST.

3. DESIGN:

A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES AFTER BEING CATALYZED PER THE MANUFACTURER'S INSTRUCTIONS IN RATIO OF 100 PARTS SILICONE RUBBER TO 25 PARTS CATALYST, BY WT.

(1) HARDNESS-DUROMETER SHORE A: 60 MINIMUM PER ASTM D676.

(2) TENSILE STRENGTH: 600 PSI MINIMUM PER ASTM D412.

(3) ELONGATION: 100 PERCENT MAXIMUM PER ASTM D412.

(4) BRITTLE POINT: -100 DEGREES F TYP PER ASTM D746.

(5) LINEAR SHRINKAGE: AFTER 24 HRS AT 77°F - 0.2 PERCENT TYP.
AFTER 7 DAYS AT 77°F - 0.4 PERCENT TYP.
ANY PERIOD AFTER 7 DAYS, TOTAL SHRINKAGE NOT TO EXCEED 1.00%.

(6) THERMAL CONDUCTIVITY: 7.5×10^{-4} CALORIES PER [(CM) (DEGREES C) (SEC)] TYP.

(7) VOLUME COEFFICIENT OF THERMAL EXPANSION: (0 TO 100°C) 3.25×10^{-4} PER DEGREE C. TYP.

(8) DIELECTRIC STRENGTH (1/16 INCH THICKNESS): 500 VOLTS DC. PER MIL TYP. PER ASTM D149.

(9) VOLUME RESISTIVITY: 3×10^{13} OHM-CM TYP PER ASTM D257.

(10) DIELECTRIC CONSTANT: (PER ASTM D150)
AT 10^2 CYCLES PER SECOND - 4.2 TYP.
AT 10^5 CYCLES PER SECOND - 3.71 TYP.

(11) DISSIPATION FACTOR: (PER ASTM D150)
AT 10^2 CYCLES PER SECOND - 0.047 TYP.
AT 10^5 CYCLES PER SECOND - 0.025 TYP.

(12) SPECIFIC GRAVITY: 1.49 TYP.

B. STORAGE: SHALL BE STORED IN CLOSED CONTAINERS AT TEMPERATURE BELOW 70°F. UPON RECEIVING FROM VENDOR.

C. SHELF LIFE: 4 MONTHS - THE MATERIAL SHALL HAVE A USABLE SHELF LIFE OF 3 MONTHS WHEN RECEIVED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN J. D. Dawaski DATE 26 Sep 63
CHECKED J. Ruggiero H. Maynard 27 Sept 63
APPROVAL C. Sparling JPK
APPROVAL JJS
APPROVAL
NASA APPROVAL 12/30/63
MIT APPROVAL 30 Dec 63
MIT APPROVAL D. Solomon 12/31/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPOUND, SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006683

SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	UPGRADED TO CLASS A WITH CHANGES PER TDRR 06956 DR L. J. Shaw CHK J. Wolkowicz APPD H. Maynard	3/17/64	WK
B	REVISED PER TDRR 18712 DR H. Wong CHK A. Cuggiano APPD H. Maynard	5 Jun 65	BJB

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO MIL-Q-9858.

B. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE AND EXPIRATION DATE, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. PROPERTIES:

(1) COLOR: RED

(2) VISCOSITY: 50,000 CENTIPOISES MAXIMUM MEASURED ON A BROOKFIELD VISCOMETER, NO. 4 SPINDLE, 2 RPM AT 25°C ± 2°C.

(3) THIS MATERIAL SHALL BE PURCHASED IN KIT FORM CONTAINING UNCATALYZED SILICONE RUBBER AND CATALYST.

3. DESIGN:

A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES AFTER BEING CATALYZED PER THE MANUFACTURER'S INSTRUCTIONS IN RATIO OF 100 PARTS SILICONE RUBBER TO 4 PARTS CATALYST, BY WT.

(1) HARDNESS-DUROMETER SHORE A: 60 MINIMUM PER ASTM D676.

(2) TENSILE STRENGTH: 600 PSI MINIMUM PER ASTM D412.

(3) ELONGATION: 100 PERCENT MAXIMUM PER ASTM D412.

(4) BRITTLE POINT: -100 DEGREES F TYP PER ASTM D746.

(5) LINEAR SHRINKAGE: AFTER 24 HRS AT 77°F - 0.2 PERCENT TYP.
AFTER 7 DAYS AT 77°F - 0.4 PERCENT TYP.
ANY PERIOD AFTER 7 DAYS, TOTAL SHRINKAGE NOT TO EXCEED 1.00%.

(6) THERMAL CONDUCTIVITY: 7.5×10^{-4} CALORIES PER [(CM) (DEGREES C) (SEC)] TYP.

(7) VOLUME COEFFICIENT OF THERMAL EXPANSION: (0 TO 100°C) 3.25×10^{-4} PER DEGREE C. TYP.

(8) DIELECTRIC STRENGTH (1/16 INCH THICKNESS): 500 VOLTS DC. PER MIL TYP PER ASTM D149.

(9) VOLUME RESISTIVITY: 3×10^{13} OHM-CM TYP PER ASTM D257.

(10) DIELECTRIC CONSTANT: (PER ASTM D150)
AT 10^2 CYCLES PER SECOND - 4.2 TYP.
AT 10^5 CYCLES PER SECOND - 3.71 TYP.

(11) DISSIPATION FACTOR: (PER ASTM D150)
AT 10^2 CYCLES PER SECOND - 0.047 TYP.
AT 10^5 CYCLES PER SECOND - 0.025 TYP.

(12) SPECIFIC GRAVITY: 1.49 TYP.

B. STORAGE: SHALL BE STORED IN CLOSED CONTAINERS AT TEMPERATURE BELOW 70°F UPON RECEIVING FROM VENDOR.

C. SHELF LIFE: 4 MONTHS - THE MATERIAL SHALL HAVE A USABLE SHELF LIFE OF 3 MONTHS WHEN RECEIVED.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J. D. Drawbach DATE 26 Sep 63
CHECKED J. Ruggerio H. Maynard 27 Sept 63
APPROVAL C. Sparling
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 30 Oct 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPOUND, SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006683
SCALE NONE
WT
SHEET 1 OF 1

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

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REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. PROPERTIES:

(1) COLOR: RED

(2) VISCOSITY: 30,000 CENTIPOISES MEASURED ON A BROOKFIELD VISCOMETER, NO. 4 SPINDLE, 2 RPM.

(3) SPECIFIC GRAVITY: 1.47

3. DESIGN:

A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES AFTER BEING CATALYZED PER THE MANUFACTURER'S INSTRUCTION.

(1) HARDNESS-DUROMETER SHORE A: 65 MINIMUM PER ASTM D676.

(2) TENSILE STRENGTH: 650 PSI MINIMUM PER ASTM D412.

(3) ELONGATION: 110 PERCENT MAXIMUM PER ASTM D412.

(4) BRITTLE POINT: -100 DEGREES F MINIMUM PER ASTM D746.

(5) LINEAR SHRINKAGE: AFTER 24 HRS AT 77°F - 0.2 PERCENT MAXIMUM
AFTER 7 DAYS AT 77°F - 0.4 PERCENT MAXIMUM

(6) THERMAL CONDUCTIVITY: 7.5×10^{-4} CALORIES PER [(CM) (DEGREES C) (SEC)] MINIMUM.

(7) VOLUME COEFFICIENT OF THERMAL EXPANSION: (0 TO 100°C) 3.25×10^{-4} PER DEGREE C.

(8) DIELECTRIC STRENGTH (1/16 INCH THICKNESS): 500 VOLTS DC. PER MIL MINIMUM PER ASTM D149.

(9) VOLUME RESISTIVITY: 3×10^{13} OHM-CM MINIMUM PER ASTM D257.

(10) DIELECTRIC CONSTANT: (PER ASTM D150)
AT 10^2 CYCLES PER SECOND - 4.2
AT 10^5 CYCLES PER SECOND - 3.71

(11) DISSIPATION FACTOR: (PER ASTM D150)
AT 10^2 CYCLES PER SECOND - 0.047
AT 10^5 CYCLES PER SECOND - 0.025

B. STORAGE AND SHELF LIFE: SHOULD BE STORED IN CLOSED CONTAINERS AT TEMPERATURE BELOW 70 DEGREES F. THE AS RECEIVED MATERIAL WHEN STORED UNDER THESE CONDITIONS SHALL HAVE A SHELF LIFE OF AT LEAST FOUR (4) MONTHS.

SUGGESTED SOURCE OF SUPPLY:
HUSE LIBERTY MICA CO.
PEABODY, MASS.
CODE IDENT NO. 84682
TYPE NO. RTV #860

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04/303 DATE 10/30/03

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 26 Sep 63
CHECKED 27 Sept 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPOUND, SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006683
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006683

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   B. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) MATERIAL: BOROSILICATE GLASS FURNISHED FELTED 1/2 INCH OR 3/16 INCH THICK. SEE TABLE I.

3. DESIGN:

   A. DENSITY: 4 LBS PER CUBIC FOOT FOR EITHER THICKNESS.

   B. THERMAL CONDUCTIVITY (100°F TO 700°F): .26 TO .65 BTU-IN./FT^2/°F/HR

   C. SHALL BE CAPABLE OF USE UP TO 1000°F.

   D. TENSILE STRENGTH: 1.5 POUNDS/INCH.

TABLE I

DASH NO.	NOMINAL THICKNESS-INCHES	STANDARD SHEET-INCHES
-1	3/16	36 X 120
-2	1/2	36 X 72

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 04305 DATE 10/31/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

SUGGESTED SOURCE OF SUPPLY:

L-O-F GLASS FIBERS CO.
TOLEDO 1, OHIO
CODE IDENT NO. 75829
TYPE: GLASS MICROFIBERS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 11 Oct 63
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL 10/31/63
MIT APPROVAL 30 Oct 63
MIT APPROVAL 10/31/67

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION, THERMAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006684
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04133	24Oct63	WH.

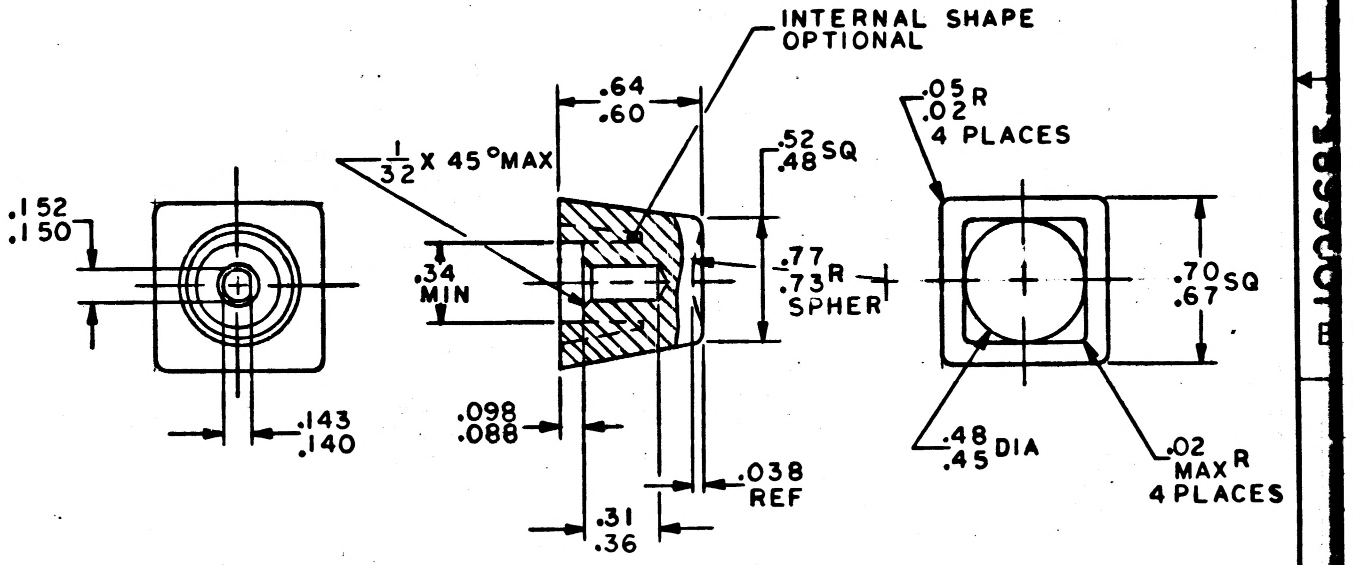
NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: INDIVIDUAL AND INTERNAL PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER). EXTERNAL PACKAGES SHALL BE MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, AND NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: AS DELINEATED

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04133 DATE 24Oct63

3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: INJECTION OR COMPRESSION MOLDED RUBBER MODIFIED ACRYLIC PLASTIC PART. MATERIAL TO BE ROHM AND HAAS COMPANY "IMPLEX B" OR PHYSICAL EQUIVALENT.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crespi DATE 5 Oct 63
CHECKED 7 Oct 63
APPROVAL
APPROVAL
A PROVAL 10/16/63
NASA APPROVAL 10/24/63
MIT APPROVAL
MIT APPROVAL 10/11/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PUSHBUTTON

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006685
SCALE NONE | WT | SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, WITH THE INLET SIDE IDENTIFICATION. PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, PART NUMBER AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING)
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: SEE SKETCH.
     - (2) CERTIFICATION: MATERIAL AND FINISH REQUIREMENT COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.
     - (3) PROOF PRESSURE: 170 PSI MINIMUM.
     - (4) FLOW RATE: 1 GPM MINIMUM AT 85 PSI.

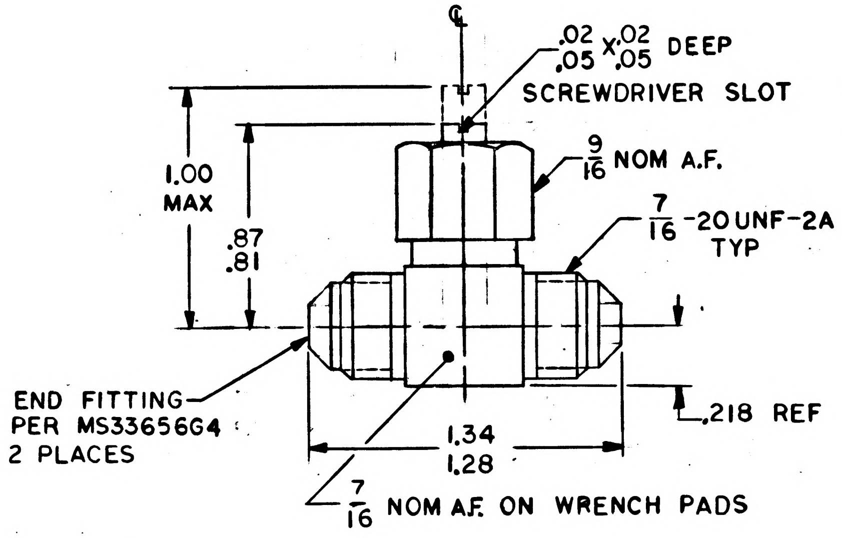
3. DESIGN REQUIREMENTS:
   - A. MATERIAL: BRASS.
   - B. FINISH: CADMIUM PLATING PER QQ-P-416, CLASS 2, TYPE II. SIGNIFICANT SURFACES FOR THIS APPLICATION ARE DEFINED AS ALL INTERNAL SURFACES AS WELL AS THOSE EXTERNAL SURFACES WHICH WOULD BE CONTACTED BY A 0.75 DIAMETER BALL. THREAD FIT CLASS SHALL BE AFTER PLATING.
   - C. UNIT SHALL BE CAPABLE OF USE WITH THE FOLLOWING LIQUID MIXTURE WITHOUT AFFECTING PLATED SURFACES OR CONTAMINATING THE LIQUID:

62.500	ETHYLENE GLYCOL	PARTS BY WEIGHT
37.422	TRIPLE DISTILLED WATER	
1.563	TRIETHANOLAMINEPHOSPHATE	
0.156	SODIUMMERCAPTOBENZOTHIOZOLE	

   - D. BURST PRESSURE: 300 PSI MINIMUM
   - E. OPERATING PRESSURE: 85 PSI.
   - F. PRESSURE DROP: 0.5 PSI MAXIMUM WITH VALVE FULL OPEN.

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 04934 DATE 3 Dec 63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS-9-498
DRAWN DATE 29 OCT 63
CHECKED 30 OCT 63
APPROVAL JPK
APPROVAL
APPROVAL 11/2/63
NASA APPROVAL 12/1/63
MIT APPROVAL 3 Dec 63
MIT APPROVAL 12/4/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VALVE, GLOBE, 1/4 TUBE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006687
SCALE NONE | WT | SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006687

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 04934		
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 28265 DR S. Langhill CHK R. J. Smith APPD H. Maynard		2/1

NOTES:

1. GENERAL REQUIREMENTS:
   - A. PARTS SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-T-55155 AND THE SPECIFICATIONS BELOW.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 3.
   - C. MARKING: PACKAGES SHALL BE MARKED, PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, PART NUMBER AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL REQUIREMENTS:
     - (1) CERTIFICATION: COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.
     - (2) DIMENSIONS: SEE SKETCH.
     - (3) COLOR: NATURAL (TRANSLUCENT WHITE).
3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: MOLDED POLYTETRAFLUOROETHYLENE BODY WITH SILVER PLATED BRASS TERMINALS MOLDED IN PLACE.
     - (1) MATERIAL: POLYTETRAFLUOROETHYLENE PER MIL-P-14078. BRASS PER QQ-B-626, COMPOSITION 22, 1/2 HARD.
     - (2) FINISH: ELECTROPLATED SILVER PER QQ-S-365, .0003 THICK.
   - B. ELECTRICAL RATINGS:
     - (1) SEE TABLE I FOR VOLTAGE AND CAPACITANCE RATINGS.
     - (2) VOLUME RESISTIVITY (50% RH AND 23°C): 10^{18} OHM-CENTIMETERS.
     - (3) DIELECTRIC CONSTANT (60 CPS TO 1 MC): 2.0 - 2.2
     - (4) DISSIPATION FACTOR (60 CPS TO 1 MC): 0.0002

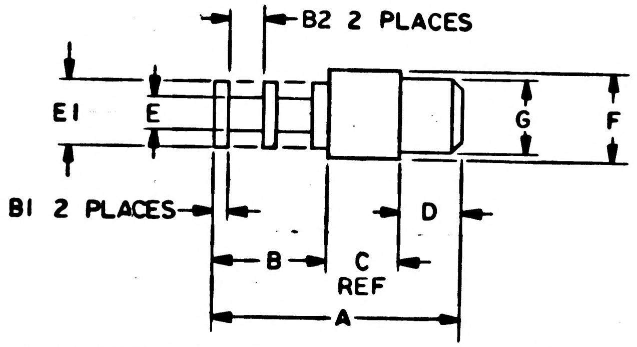
TABLE I - DIMENSIONS & VOLTAGE RATING

DASH NO.	CAP. UUF	VRMS 60 CPS		DIMENSIONS *										DASH NO.
		NOMINAL RATING	FLASHOVER SEA LEVEL	A ±.005	B ±.005	B_1 ±.005	B_2 ±.005	C REF	D ±.005	E DIA ±.005	E_1 DIA ±.005	F DIA ±.005	G DIA +.002 -.000	
-1	0.50	1500	4000	.346	.156	.020	.046	.103	.087	.046	.093	.125	.104	-1
-2	0.30	2500	6000	.431	.156	.020	.046	.125	.150	.046	.093	.187	.165	-2
-3	0.20	2800	6700	.493	.156	.020	.046	.187	.150	.046	.093	.187	.165	-3
-4	0.20	3100	7300	.556	.156	.020	.046	.250	.150	.046	.093	.187	.165	-4
-5	0.25	4500	10000	.831	.281	.031	.093	.400	.150	.046	.125	.187	.165	-5
-6	0.20	5500	12000	.968	.281	.031	.093	.500	.187	.046	.125	.250	.215	-6
-7	0.30	6000	13000	1.268	.281	.031	.093	.800	.187	.046	.125	.250	.215	-7

TABLE I (CONTINUED)

MOUNTING DATA REFERENCE

DASH NO.	HOLE DIA ± .002	60° COUNTERSINK DIA +.010 -.000	CHASSIS THICKNESS MAXIMUM
-1	.091	.115	.047
-2	.152	.175	.110
-3	.152	.175	.110
-4	.152	.175	.110
-5	.152	.175	.110
-6	.202	.235	.147
-7	.202	.235	.147



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT:
FINAL FINISH: SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN R. Wheelock DATE 8 Nov 63
CHECKED J. Russell / H. Maynard 13 Nov 63
APPROVAL C. Sperling JPK
APPROVAL
APPROVAL 11/21/63
NASA APPROVAL
MIT APPROVAL W Kupfer 3 Dec 63
MIT APPROVAL 12-4-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL,
INSULATED, PRESS FIT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006689
SCALE NONE | WT | SHEET 1 OF 1

1006689

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

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NOTES:

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   - A. PARTS SHALL CONFORM TO THE GENERAL REQUIREMENTS OF MIL-T-55155 AND THE SPECIFICATIONS BELOW.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 3.
   - C. MARKING: PACKAGES SHALL BE MARKED, PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, PART NUMBER AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER).
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     - (1) SEE TABLE I FOR VOLTAGE AND CAPACITANCE RATINGS.
     - (2) VOLUME RESISTIVITY (50% RH AND 23°C): 10^{18} OHM-CENTIMETERS.
     - (3) DIELECTRIC CONSTANT (60 CPS TO 1 MC): 2.0 - 2.2
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TABLE I - DIMENSIONS & VOLTAGE RATING

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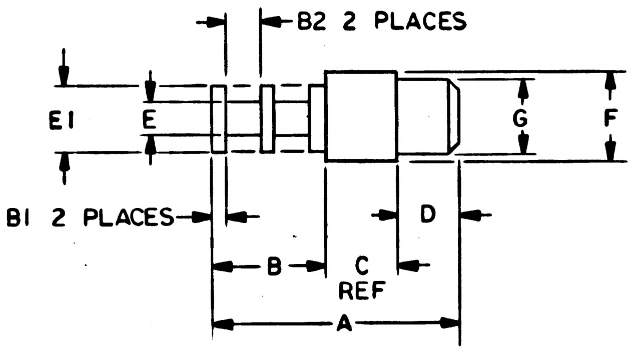
-6	0.20	5500	12000	.968	.281	.031	.093	.500	.187	.046	.125	.250	.215	-6
-7	0.30	6000	13000	1.268	.281	.031	.093	.800	.187	.046	.125	.250	.215	-7

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04934 DATE 5 Dec 63

1006689



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN R Wheeler DATE 8 Nov 63
CHECKED J Russell 13 Nov 63
APPROVAL C Sperling
APPROVAL
APPROVAL 11/21/63
NASA APPROVAL 12/3/63
MIT APPROVAL W Kupfer 3 Dec 63
MIT APPROVAL 12-4-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, INSULATED, PRESS FIT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006689
SCALE NONE | WT | SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS				
SYM	DESCRIPTION	DATE	APPROVED	
(A)	-	CLASS B RELEASE PER TDRR 05399	12-27-63	
	A	REVISED PER TDRR 07849 DR A Wheeler CHK W Walkowicz APPD H. Maynard	5/6/64	KEB

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 05399
DATE 27 Dec 63

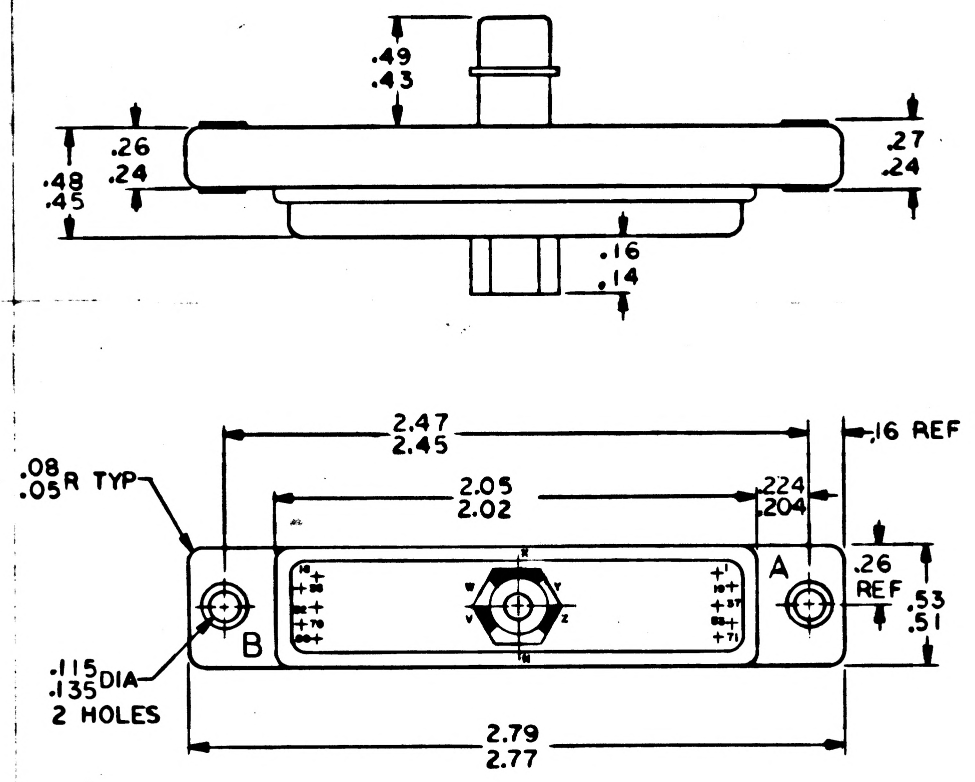
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. ASSEMBLED UNITS SHALL BE IN ACCORDANCE WITH ALL APPLICABLE PORTIONS OF MIL-C-22857 WITH EXCEPTIONS AND ADDITIONS AS SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019. WITH THE TERMINAL IDENTIFICATION ON BOTH SIDES ~~AND~~ POLARIZATION MARKING. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, QUANTITY ENCLOSED, NASA DRAWING NUMBER AND REVISION LETTER.
   - E. PACKAGING: CONTACTS SUPPLIED WITH THE CONNECTOR SHALL BE BULK PACKAGED IN PLIOFILM BAG.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: SEE VIEW.
   - B. CONNECTOR SHALL BE DESIGNED TO ACCEPT CRIMP TYPE SOCKET CONTACTS PER NASA DRAWING 1010738-1.
   - C. SHALL BE DESIGNED TO MATE WITH NASA DRAWING 1006825.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITHOUT ELECTRICAL DETERIORATION.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT ELECTRICAL DETERIORATION.
   - C. CONSTRUCTION: MATERIALS AND FINISH IN ACCORDANCE WITH MIL-C-22857.

4. SPECIAL CONDITIONING: NOT APPLICABLE.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J D Wheeler DATE
CHECKED J Ringer
APPROVAL H. Morse JFK 6 DEC 63
APPROVAL JJS
APPROVAL 12/6/63
NASA APPROVAL 12/27/63
MIT APPROVAL 27 Dec 63
MIT APPROVAL 12-27-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL
88 CRIMP TYPE SOCKETS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006690
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

5 4 3 2 1

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
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FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 05399
DATE 27 Dec 63

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. ASSEMBLED UNITS SHALL BE IN ACCORDANCE WITH ALL APPLICABLE PORTIONS OF MIL-C-22857 WITH EXCEPTIONS AND ADDITIONS AS SPECIFIED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE TERMINAL IDENTIFICATION ON BOTH SIDES AND POLARIZATION MARKING. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, QUANTITY ENCLOSED, NASA DRAWING NUMBER AND REVISION LETTER.

E. PACKAGING: CONTACTS SUPPLIED WITH THE CONNECTOR SHALL BE BULK PACKAGED IN PLIOFILM BAG.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:
   (1) DIMENSIONS: SEE VIEW.

B. CONNECTOR SHALL BE FURNISHED WITH A QUANTITY OF 97 UNASSEMBLED CRIMP TYPE SOCKET CONTACTS PER NASA DRAWING 1010464-1.

C. SHALL BE DESIGNED TO MATE WITH NASA DRAWING 1006825.

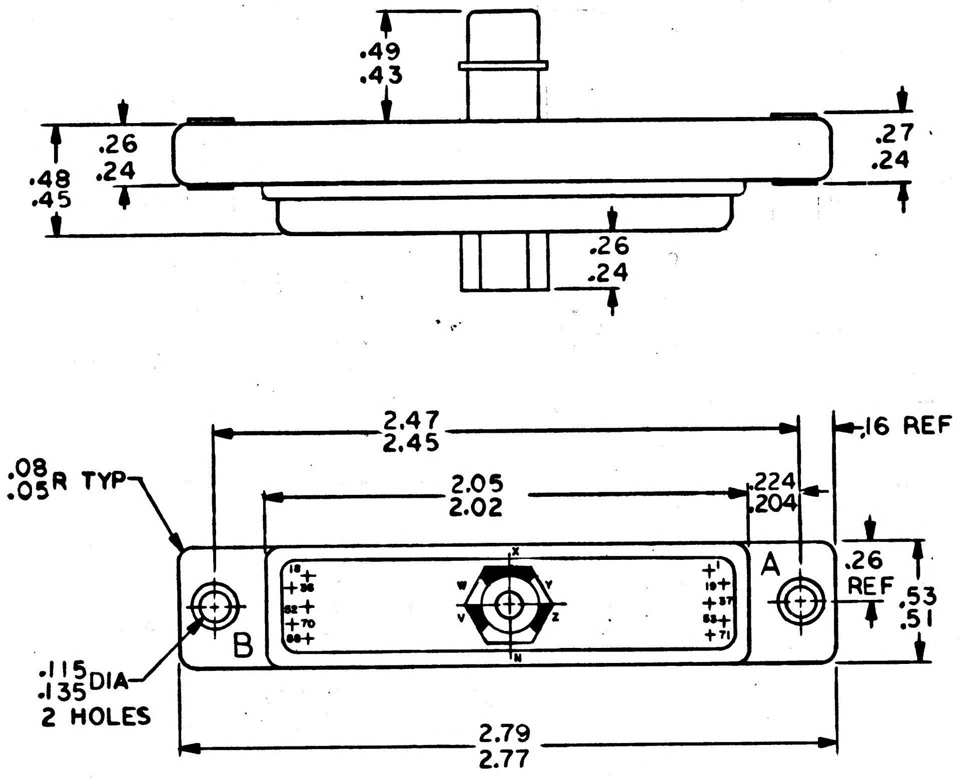
3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITHOUT ELECTRICAL DETERIORATION.

B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT ELECTRICAL DETERIORATION.

C. CONSTRUCTION: MATERIALS AND FINISH IN ACCORDANCE WITH MIL-C-22857.

4. SPECIAL CONDITIONING: NOT APPLICABLE.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J. D. Wheeler DATE 30 Oct 63
CHECKED J. Ringer
APPROVAL H. Morse JPK 6 Dec 63
APPROVAL J. JIS
APPROVAL 12/6/63
NASA APPROVAL 12/27/63
MIT APPROVAL 27 Dec 63
MIT APPROVAL 12-27-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL
88 CRIMP TYPE SOCKETS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006690
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

5 4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006690

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 05395	12-27-63	
A	REVISED PER TDRR 10971 DR CHK JCJ APPD H. Maynard		KEB

TABLE I

DASH NO.	WIDTH ± .06
-1	.50
-2	1.00
-3	1.50
-4	2.00

REQUIREMENTS:

1. GENERAL REQUIREMENTS:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   B. MARKING: EACH ROLL OF TAPE SHALL BE PERMANENTLY AND LEGIBLY MARKED, ON THE INSIDE DIAMETER OF THE CORE PER ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NO.). UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT CODE, DATE OF MANUFACTURE, EXPIRATION DATE AND NASA PART NUMBER. IF TAPE IS SUPPLIED AT MANUFACTURER'S OPTION, WITHOUT A CORE, THE IDENTIFYING MARKING SHALL BE ON AN ENCLOSED PACKING SLIP.

2. ACCEPTANCE AND INSPECTION (SAMPLING)

   A. MECHANICAL PROPERTIES:

      (1) THICKNESS: TAPE 0.006 NOM, OVERALL 0.010 MAX.

      (2) WIDTH: SEE TABLE I.

      (3) ROLL LENGTH: 18 YARDS (648 INCHES)

      (4) TENSILE STRENGTH: 75 POUNDS PER INCH OF WIDTH (MINIMUM)

      (5) PEEL STRENGTH (ADHESION): 20 OUNCES PER INCH OF WIDTH (MINIMUM)

3. DESIGN:

   A. STORAGE LIFE: 6 MONTHS MINIMUM AT ROOM TEMPERATURE (77°F REFERENCE) WITHOUT ADHESIVE DETERIORATION.

   B. CONSTRUCTION: GLASS CLOTH IMPREGNATED WITH TEFLON AND COATED WITH A SILICONE PRESSURE SENSITIVE ADHESIVE.

FOR INFORMATION ONLY

CLASS B RELEASE TDRR 05395 DATE 12/27/63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 7 DEC 63
CHECKED J. /H. Maynard 9 DEC 63
APPROVAL 12 DEC 63
APPROVAL
APPROVAL 12/12/63
NASA APPROVAL 12/21/63
MIT APPROVAL 27 Dec 63
MIT APPROVAL 12/27/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE, PRESSURE SENSITIVE ADHESIVE
SUPPORTED TEFLON
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006692
SCALE NONE
WT
SHEET 1 OF 1

1006692

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

TABLE I

DASH NO.	WIDTH ± .06
-1	.50
-2	1.00
-3	1.50
-4	2.00

NOTES:

1. GENERAL REQUIREMENTS:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   B. MARKING: EACH ROLL OF TAPE SHALL BE PERMANENTLY AND LEGIBLY MARKED, ON THE INSIDE DIAMETER OF THE CORE PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NO.). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT CODE, DATE OF MANUFACTURE, AND NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING)

   A. MECHANICAL PROPERTIES:

      (1) THICKNESS: TAPE 0.006 NOM, OVERALL 0.010 MAX. no min?

      (2) WIDTH: SEE TABLE I.

      (3) ROLL LENGTH: 36 YARDS (1296 INCHES)

      (4) TENSILE STRENGTH: 75 POUNDS PER INCH OF WIDTH (MINIMUM)

      (5) PEEL STRENGTH (ADHESION): 20 OUNCES PER INCH OF WIDTH (MINIMUM)

3. DESIGN REQUIREMENTS:

   A. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE (77°F REFERENCE) WITHOUT ADHESIVE DETERIORATION.

   B. CONSTRUCTION: GLASS CLOTH IMPREGNATED WITH TEFLON AND COATED WITH A SILICONE PRESSURE SENSITIVE ADHESIVE.

3. DESIGN ... ENTS: A. ...ITHOUT ADHESIVE DETERIATION.

FOR INFORMATION ONLY

CLASS B RELEASE TDRR 05395 DATE 12/27/63

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 7 DEC 63
CHECKED J. Pelzzgin/R. Maynard 9 DEC 63
APPROVAL 12 DEC 63
APPROVAL
APPROVAL L. E. Spitnard RPB 12/12/63
NASA APPROVAL 12/27/63
MIT APPROVAL 27 Dec 63
MIT APPROVAL Dennis M. 12/27/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE, PRESSURE SENSITIVE ADHESIVE
SUPPORTED TEFLON
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006692
SCALE NONE
WT
SHEET 1 OF 1

1006692

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 09765		
A	CHANGE PER TDRR 11956 DR CHK APPD	9/11/64	KEB

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH NASA DOCUMENT 1002019 WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND TERMINAL IDENTIFICATION. PACKAGING SHALL BE MARKED INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, DATE OF MANUFACTURE OR CODING, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: SEE SKETCH.

(2) MARKING PER NOTE 1.B.

(3) A CERTIFICATE OF COMPLIANCE WITH THE MATERIALS AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. MATERIALS AND FINISH: Gl

(1) SHELL AND CLAMP: ALUMINUM ALLOY PER QQ-A-591, CADMIUM PLATED PER QQ-P-416, TYPE I, CLASS 3.

(2) CONTACT PLATE: ALUMINUM ALLOY PER QQ-A-561.

(3) CONTACTS: IN ACCORDANCE WITH NASA DRAWING 1006782-2.

(4) INSULATORS: IN ACCORDANCE WITH NASA DRAWING 1006775-1.

(5) TERMINAL BOARD: GLASS FILLED PHENOLIC PER MIL-M-14, TYPE GPI-100.

(6) TERMINAL BOARD CONTACTS: BRASS PER QQ-B-613 COMPOSITION 24, 1/2 HARD, GOLD PLATED PER MIL-G-45204 TYPE II OVER SILVER PLATE PER QQ-S-365 TYPE I.

B. ELECTRICAL:

(1) FLASHOVER VOLTAGE: 1900 TO 2600 VOLTS RMS BETWEEN CONTACTS; 1200 TO 1700 VOLTS RMS BETWEEN CONTACTS AND GROUND.

(2) INSULATION RESISTANCE: 18,000 TO 25,000 MEGOHMS BETWEEN CONTACTS; 25,000 TO 30,000 MEGOHMS BETWEEN CONTACTS AND GROUND.

(3) CONTACT RESISTANCE: 0.0014 TO 0.0020 OHMS AND 1.4 TO 2.0 MILLIVOLTS DROP AT 1 AMPERE D.C.; 0.0014 TO 0.0018 OHMS AND 4.2 TO 5.4 MILLIVOLT DROP AT 3 AMPERES D.C.; 0.0014 TO 0.0018 OHMS AND 7.0 TO 9.0 MILLIVOLTS DROP AT 5 AMPERES DC WHEN MATED WITH CONTACT PER NASA DRAWING 1006781 AND INSULATOR PER NASA DRAWING 1006774.

C. MECHANICAL:

(1) INSERTION AND RETENTION SHALL BE PER ND 1002136 FOR MATING PARTS (NASA DWG 1006781) AND INSULATORS (NASA DWG 1006774).

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 09765 DATE 6/2/64

DASH NO.	POLARIZATION (SEE DRAWING)
-1	POSITION 1
-2	POSITION 2

SHEET 1	SHEET 2	SHEET 3
A	-	A

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S.T. Dellie DATE 12FEB64
CHECKED 6MAY64
APPROVAL
APPROVAL
APPROVAL R. E. Brown
NASA APPROVAL W J Rhine 6-3-64
MIT APPROVAL 6/2/64
MIT APPROVAL Charles Sparling 6/2/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL, 68 CONTACTS, MALE
SPECIFICATION CONTROL DRAWING

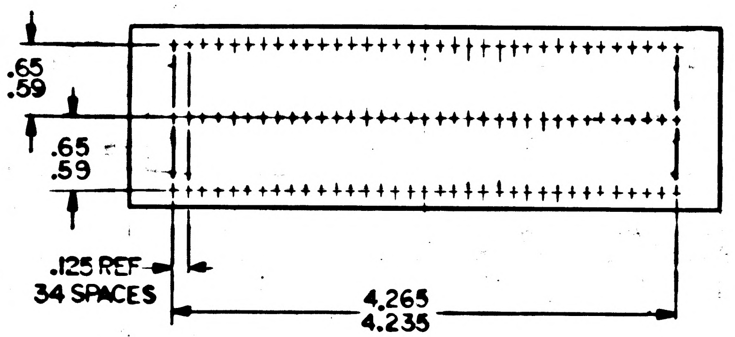
CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006693
SCALE NONE WT SHEET 1 OF 3

1006693 B

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

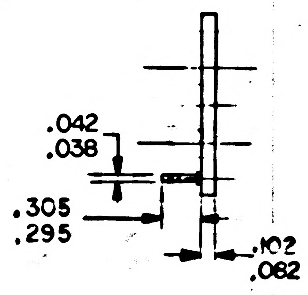
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE. PER TDRR 09765		
A	CHANGE PER TDRR 11956 DR CJ Jones CHK Jfd APPD	7/14/64	KES

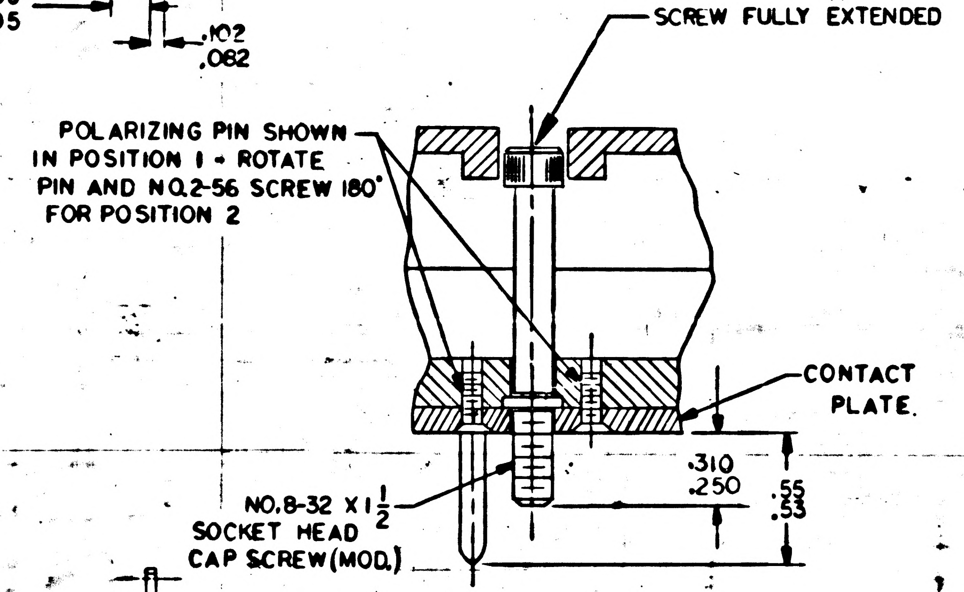


.65
.59
.65
.59
.125 REF
34 SPACES
4.265
4.235

TERMINAL BOARD
SEE NOTE 3A(5)

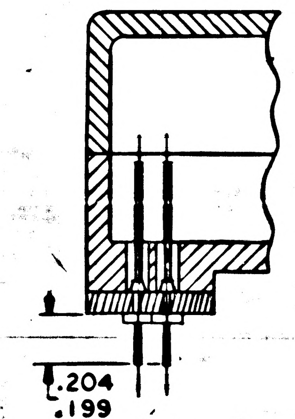


.042
.038
.305
.295
.102
.062

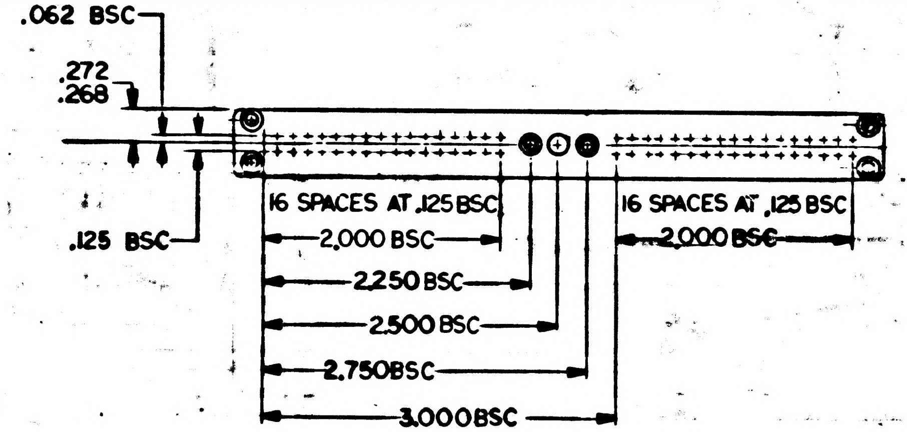


SCREW FULLY EXTENDED
POLARIZING PIN SHOWN IN POSITION 1 - ROTATE PIN AND NO.2-56 SCREW 180° FOR POSITION 2
CONTACT PLATE.
NO.8-32 X 1 1/2 SOCKET HEAD CAP SCREW (MOD.)
.310
.250
.55
.53

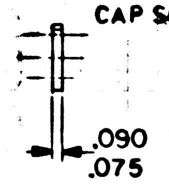
KEYING CONFIGURATION
(SEE SHEET 2)



SECTION A-A
ROTATED 90° CCW
(SEE SHEET 2)
SCALE 2/1

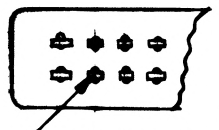


.062 BSC
.272
.268
.125 BSC
16 SPACES AT .125 BSC
16 SPACES AT .125 BSC
2.000 BSC
2.000 BSC
2.250 BSC
2.500 BSC
2.750 BSC
3.000 BSC



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 09765 DATE 6/2/64

CONTACT PLATE
SEE NOTE 3A(2)



CONTACTS TO BE POLARIZED AS SHOWN

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
±

DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS-9-498
DRAWN S.T. [illegible] DATE 31MAR64
CHECKED [illegible] 6MAY64
APPROVAL [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 6-2-64
MIT APPROVAL [illegible] 6/2/64
MIT APPROVAL [illegible] 6/1/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL,
68 CONTACTS, MALE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006693
SCALE NONE	WT	SHEET 3 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006693

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 09765		
A	CHANGE PER TDRR 11956 DR CHK APPD	7/1/64	KEB
B	CHANGE PER TDRR 14035 DR R.D. CHK A. Aggiano APPD H Maynard		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH NASA DOCUMENT 1002019 WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND TERMINAL IDENTIFICATION. PACKAGING SHALL BE MARKED INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, DATE OF MANUFACTURE OR CODING, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: SEE SKETCH.

(2) MARKING PER NOTE 1.B.

(3) A CERTIFICATE OF COMPLIANCE WITH THE MATERIALS AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. MATERIALS AND FINISH:

(1) SHELL, CLAMP, COVER & CONTACT PLATE: ALUMINUM ALLOY PER QQ-A-591, BLACK ANODIZE PER MIL-A-8625, TYPE I.

~~(2) CONTACT PLATE: ALUMINUM ALLOY PER QQ-A-561.~~

(3) CONTACTS: IN ACCORDANCE WITH NASA DRAWING 1006782-2.

(4) INSULATORS: IN ACCORDANCE WITH NASA DRAWING 1006775-1.

(5) TERMINAL BOARD: GLASS FILLED PHENOLIC PER MIL-M-14, TYPE GPI-100.

(6) TERMINAL BOARD CONTACTS: BRASS PER QQ-B-613 COMPOSITION 24, 1/2 HARD, GOLD PLATED PER MIL-G-45204 TYPE II OVER SILVER PLATE PER QQ-S-365 TYPE I.

(7) WIRE ROPE ASSY: PART OF -3, CRES PER QQ-S-763, PASSIVATE PER MIL-F-14072 TYPE E, PVC COATED, 8 INCHES LONG.

(8) RIVET, CSK HD, PART OF -3, AL PER 5056-H32

B. ELECTRICAL:

(1) FLASHOVER VOLTAGE: 1900 TO 2600 VOLTS RMS BETWEEN CONTACTS; 1200 TO 1700 VOLTS RMS BETWEEN CONTACTS AND GROUND.

(2) INSULATION RESISTANCE: 18,000 TO 25,000 MEGOHMS BETWEEN CONTACTS; 25,000 TO 30,000 MEGOHMS BETWEEN CONTACTS AND GROUND.

(3) CONTACT RESISTANCE: 0.0014 TO 0.0020 OHMS AND 1.4 TO 2.0 MILLIVOLTS DROP AT 1 AMPERE D.C.; 0.0014 TO 0.0018 OHMS AND 4.2 TO 5.4 MILLIVOLT DROP AT 3 AMPERES D.C.; 0.0014 TO 0.0018 OHMS AND 7.0 TO 9.0 MILLIVOLTS DROP AT 5 AMPERES DC WHEN MATED WITH CONTACT PER NASA DRAWING 1006781 AND INSULATOR PER NASA DRAWING 1006774.

C. MECHANICAL:

(1) INSERTION AND RETENTION SHALL BE PER ND 1002136 FOR MATING PARTS (NASA DWG 1006781) AND INSULATORS (NASA DWG 1006774).

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 09765 DATE 6/2/64

DASH NO.	POLARIZATION (SEE DRAWING)	DESCRIPTION
-1	POSITION 1	CONN. LESS COVER
-2	POSITION 2	CONN. LESS COVER
-3	-	COVER LESS CONN.
-4	POSITION 1	CONN. WITH COVER
-5	POSITION 2	CONN. WITH COVER

B	B	A
A	-	A
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S.T. Attia DATE 12FEB64
CHECKED W.W. Koenig 6MAY64
APPROVAL
APPROVAL
APPROVAL R.E. Brown
NASA APPROVAL W.J. Rhine 6-2-64
MIT APPROVAL 6/2/64
MIT APPROVAL Charles Sparling 6/2/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL, 68 CONTACTS, MALE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006693
SCALE NONE WT SHEET 1 OF 3

1006693

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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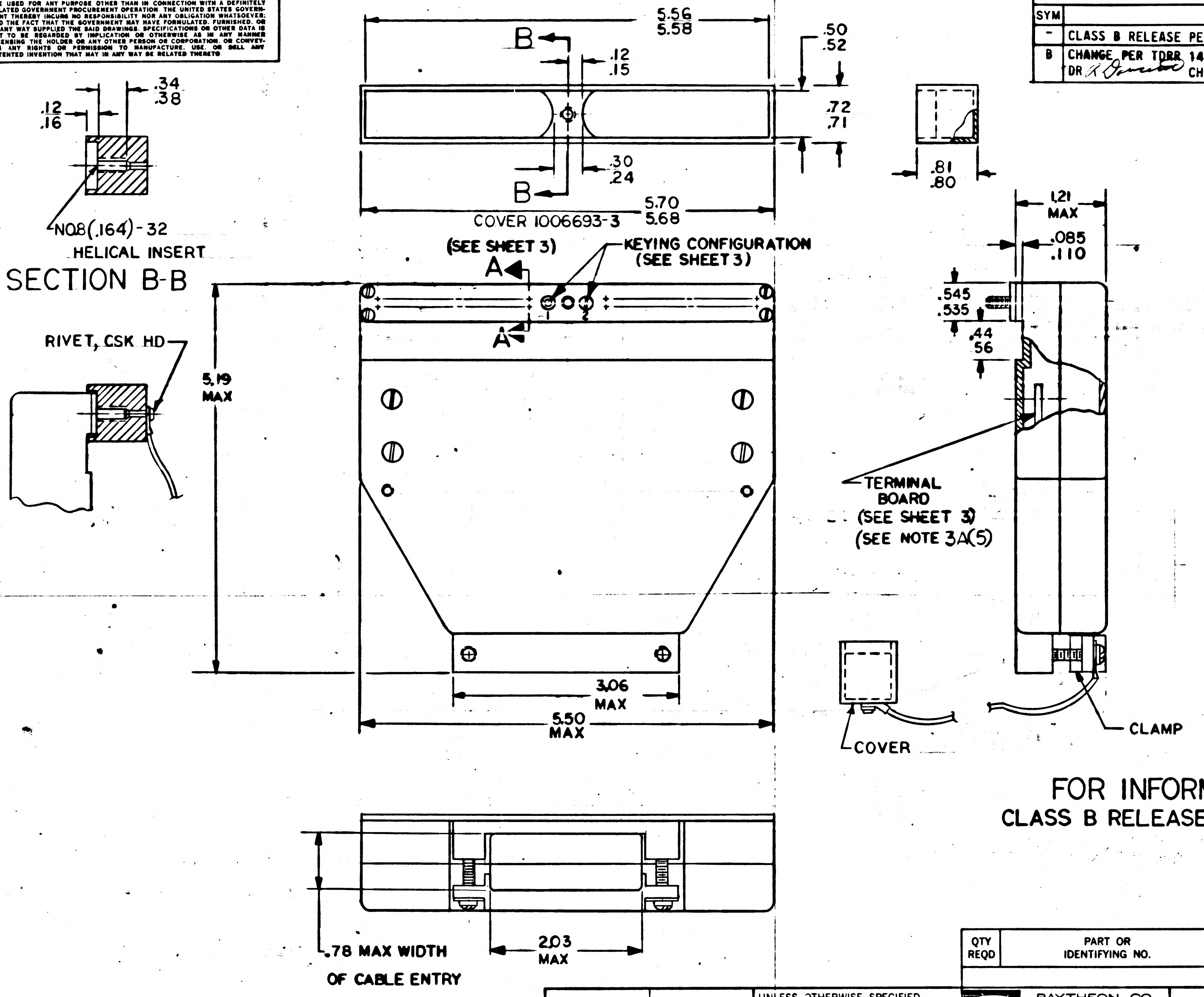
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 09765		
B	CHANGE PER TDRR 14035 DR R. Davenport CHK A. Coggins APPD A Maynard	9-2-64	



5.56
5.58
B
.12
.15
.50
.52
.72
.71
.30
.24
B
5.70
5.68
COVER 1006693-3
.81
.80
.34
.38
.12
.16
NO8(.164)-32
HELICAL INSERT
SECTION B-B
(SEE SHEET 3)
A
KEYING CONFIGURATION
(SEE SHEET 3)
A
RIVET, CSK HD
5.19
MAX
1.21
MAX
.085
.110
.545
.535
.44
.56
TERMINAL
BOARD
(SEE SHEET 3)
(SEE NOTE 3A(5)
3.06
MAX
5.50
MAX
COVER
CLAMP
.78 MAX WIDTH
OF CABLE ENTRY
2.03
MAX

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 09765 DATE 6/2/64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN T.O. [illegible] DATE 12 FEB 64
CHECKED [illegible] 2 MAR 64
APPROVAL [illegible] JPK
APPROVAL [illegible] JJB
APPROVAL K. E. Brown
NASA APPROVAL W. [illegible] 6-2-64
MIT APPROVAL [illegible] 6/2/64
MIT APPROVAL C. [illegible] 6/1/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL,
68 CONTACTS, MALE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006693

SCALE NONE WT SHEET 2 OF 3

1006693

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 09765		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MD 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH NASA [illegible] DOCUMENT 1002019 WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND TERMINAL IDENTIFICATION. PACKAGING SHALL BE MARKED INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, DATE OF MANUFACTURE OR CODING, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: SEE SKETCH.

(2) MARKING PER NOTE 1.B.

(3) A CERTIFICATE OF COMPLIANCE WITH THE MATERIALS AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. MATERIALS AND FINISH: GL

(1) SHELL AND CLAMP: ALUMINUM ALLOY PER QQ-A-591, CADMIUM PLATED PER QQ-P-416, TYPE I, CLASS 3.

(2) CONTACT PLATE: ALUMINUM ALLOY PER QQ-A-561.

(3) CONTACTS: IN ACCORDANCE WITH NASA DRAWING 1006782-2.

(4) INSULATORS: IN ACCORDANCE WITH NASA DRAWING 1006775-1.

(5) TERMINAL BOARD: GLASS FILLED PHENOLIC PER MIL-M-14, TYPE GPI-100.

(6) TERMINAL BOARD CONTACTS: BRASS PER QQ-B-613 COMPOSITION 24, 1/2 HARD, GOLD PLATED PER MIL-G-45204 TYPE II. OVER SILVER PLATE PER QQ-S-365 TYPE I.

B. ELECTRICAL:

(1) FLASHOVER VOLTAGE: 1900 TO 2600 VOLTS RMS BETWEEN CONTACTS; 1200 TO 1700 VOLTS RMS BETWEEN CONTACTS AND GROUND.

(2) INSULATION RESISTANCE: 18,000 TO 25,000 MEGOHMS BETWEEN CONTACTS; 25,000 TO 30,000 MEGOHMS BETWEEN CONTACTS AND GROUND.

(3) CONTACT RESISTANCE: 0.0014 TO 0.0020 OHMS AND 1.4 TO 2.0 MILLIVOLTS DROP AT 1 AMPERE D.C.; 0.0014 TO 0.0018 OHMS AND 4.2 TO 5.4 MILLIVOLT DROP AT 3 AMPERES D.C.; 0.0014 TO 0.0018 OHMS AND 7.0 TO 9.0 MILLIVOLTS DROP AT 5 AMPERES DC WHEN MATED WITH CONTACT PER NASA DRAWING 1006781 AND INSULATOR PER NASA DRAWING 1006774.

C. MECHANICAL:

(1) INSERTION AND RETENTION SHALL BE PER [illegible] PARTS MD 1002136 FOR MATING PARTS (NASA DWG [illegible] 1006781) AND INSULATORS (NASA DWG 1006774).

(2) [illegible] OF CONTACTS. [illegible]

PROCURE ONLY FROM APPROVED SOURCES LISTED IN MD 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 09765 DATE 6/2/64

DASH NO.	POLARIZATION (SEE DRAWING)
-1	POSITION 1
-2	POSITION 2

—	—	—
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S.T. [illegible] DATE 12FEB64
CHECKED [illegible] 6MAY64
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL W J [illegible] 6-8-64
MIT APPROVAL [illegible] 6/2/64
MIT APPROVAL Charles [illegible] 6/2/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL, 68 CONTACTS, MALE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006693
SCALE NONE WT SHEET 1 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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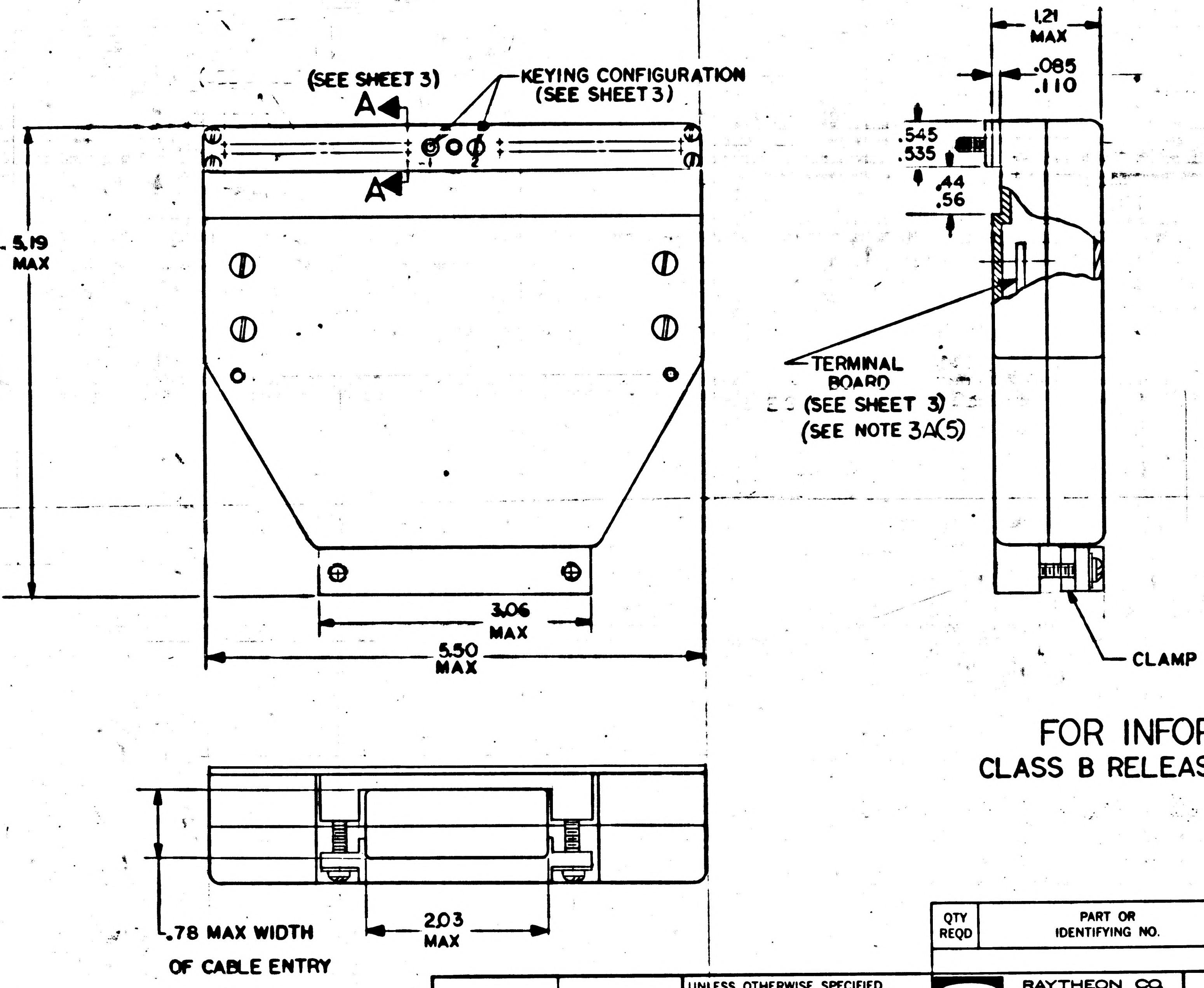
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 09765		


(SEE SHEET 3)
A
KEYING CONFIGURATION (SEE SHEET 3)
1
2
A
5.19 MAX
3.06 MAX
5.50 MAX
1.21 MAX
.085 .110
.545 .535
.44 .56
TERMINAL BOARD (SEE SHEET 3) (SEE NOTE 3A(5)
CLAMP
.78 MAX WIDTH OF CABLE ENTRY
2.03 MAX

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 09765 DATE 6/2/64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S.T.O. DATE 12 FEB 64
CHECKED 2 MAY 64
APPROVAL
APPROVAL
APPROVAL K. E. Brown
NASA APPROVAL 6-2-64
MIT APPROVAL 6/2/64
MIT APPROVAL 6/1/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL, 68 CONTACTS, MALE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006693
SCALE NONE WT SHEET 2 OF 3

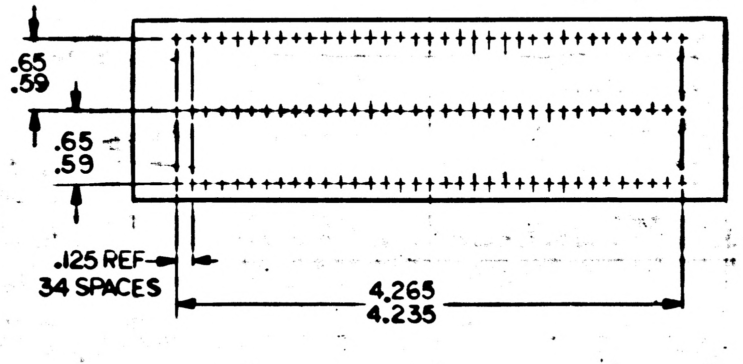
1006693 B

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

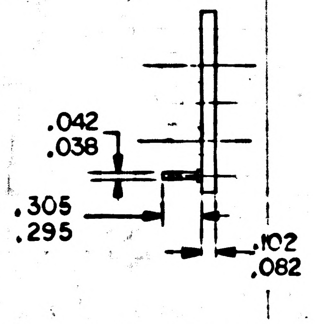
NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

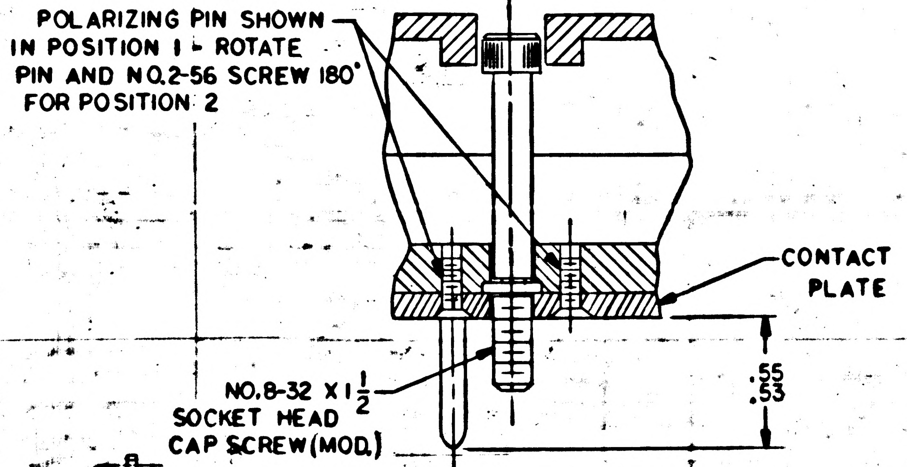
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–	CLASS B RELEASE PER TDRR 09765		

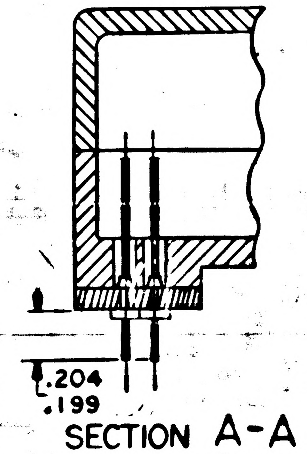

.65
.59
.65
.59
.125 REF
34 SPACES
4.265
4.235

TERMINAL BOARD
SEE NOTE 3A(5)

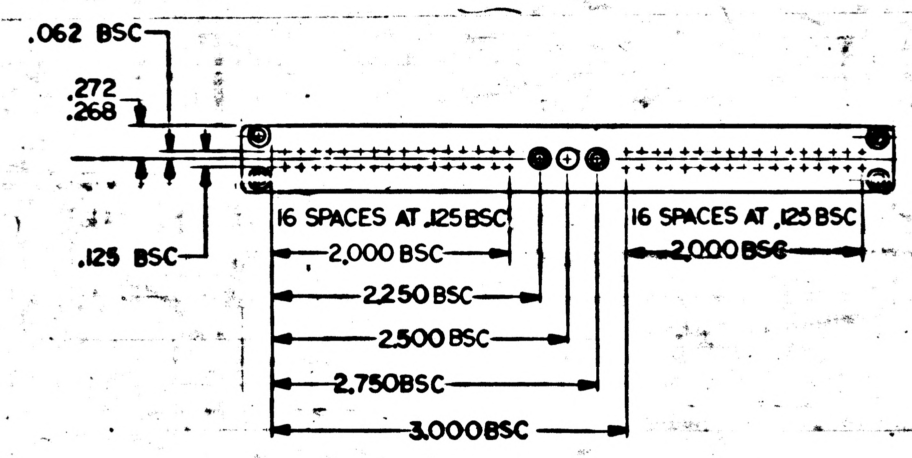

.042
.038
.305
.295
.102
.082


POLARIZING PIN SHOWN IN POSITION 1 – ROTATE PIN AND NO.2-56 SCREW 180° FOR POSITION 2
CONTACT PLATE
NO.8-32 X 1½ SOCKET HEAD CAP SCREW (MOD.)
.55
.53

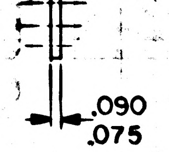
KEYING CONFIGURATION
(SEE SHEET 2)



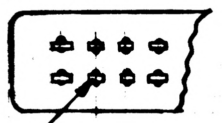
SECTION A-A
ROTATED 90° CCW
(SEE SHEET 2)
SCALE 2/1


.062 BSC
.272
.268
.125 BSC
16 SPACES AT .125 BSC
16 SPACES AT .125 BSC
2.000 BSC
2.000 BSC
2.250 BSC
2.500 BSC
2.750 BSC
3.000 BSC

CONTACT PLATE
SEE NOTE 3A(2)



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 09765 DATE 6/2/64



CONTACTS TO BE POLARIZED AS SHOWN

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
±

DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS-9-498

DRAWN S.T. Quilice DATE 31MAR64
CHECKED [illegible] MAR64
APPROVAL [illegible]
APPROVAL [illegible]
APPROVAL K.E. Brown
NASA APPROVAL W.J. Rhine 6-2-64
MIT APPROVAL [illegible] 6/2/64
MIT APPROVAL [illegible] 6/1/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL,
68 CONTACTS, MALE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006693
SCALE NONE	WT	SHEET 3 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006693

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

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REVISIONS

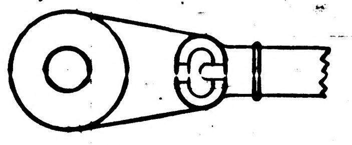
SYM	DESCRIPTION	DATE	APPROVED
—	CLASS B RELEASE TDRR 06456	2/18/64	
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 21179 DR P. Milano CHK K.A. APPD	9/2/65	

REQUIREMENTS:

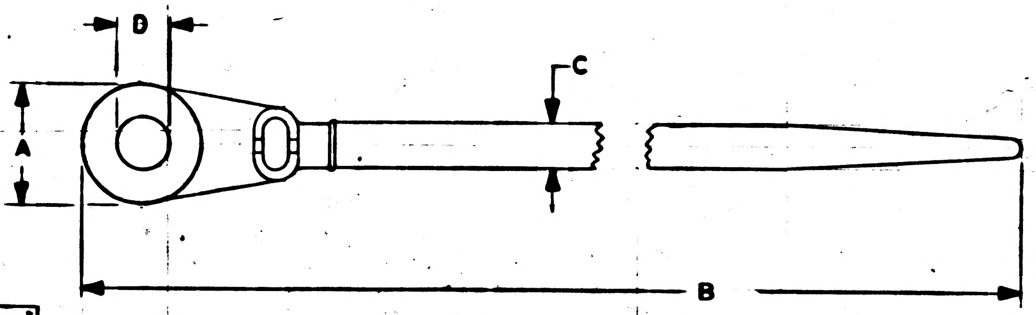
1. GENERAL:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-23190 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - B. SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS: SEE TABLE I.
     - (2) COLOR: NATURAL

3. DESIGN:
   - A. MATERIAL:
     - (1) STRAP: NYLON PER MIL-M-20693, TYPE I.
     - (2) METAL CLINCHING CLIP (SELF-CLINCHING TYPE ONLY) AND MOUNTING RING: CORROSION RESISTANT STEEL PER QQ-S-766, CLASS 302.
   - B. TEMPERATURE RANGE: -65°F TO +350°F.



SELF CLINCHING CONFIGURATION FOR
1006697-2
AND
1006697-5



CONFIGURATION FOR 1006697-1,
1006697-3 AND 1006697-4

TABLE I

DASH NO.	A	B MIN	C	D	SELF CLINCHING	WIRE BUNDLE DIAMETER RANGE (INCHES)	MINIMUM TENSILE UNLOCKING STRENGTH PSI
-1	.44 .42	7.81	.20 .18	.196 .203	-	1/16 TO 1-3/4	50
-2	.44 .42	7.75	.20 .18	.196 .203	X	1/16 TO 1-3/4	50
-3	.23 .21	4.00	.098 .088	.116 .125	-	1/16 TO 5/8	18
-4	.54 .52	13.93	.31 .29	.261 .272	-	3/16 TO 3-3/4	120
-5	.54 .52	13.93	.31 .29	.261 .272	X	3/16 TO 3-3/4	120

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN S.T. DATE 23 JAN 64
CHECKED W. J. Gifford 27 JAN 64
APPROVAL 7 FEB 64
APPROVAL
APPROVAL 2/4/64
NASA APPROVAL 2/18/64
MIT APPROVAL
MIT APPROVAL 2-17-64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CLAMP, LOOP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006697
SCALE NONE
WT
SHEET 1 OF 1

1006697

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
	CLASS B RELEASE TDRR 06456	2/18/64	

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-23190 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: SEE TABLE I.

(2) COLOR: NATURAL

3. DESIGN:

A. MATERIAL:

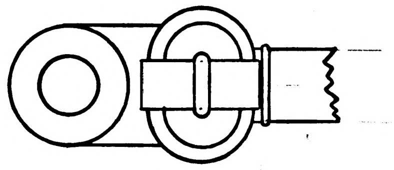
(1) STRAP: NYLON PER MIL-M-20693, TYPE I.

(2) METAL CLINCHING CLIP (SELF-CLINCHING TYPE ONLY) AND MOUNTING RING: CORROSION RESISTANT STEEL PER QQ-S-766, CLASS 302.

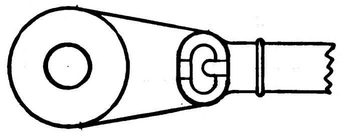
B. TEMPERATURE RANGE: -65°F TO +350°F.

TABLE I

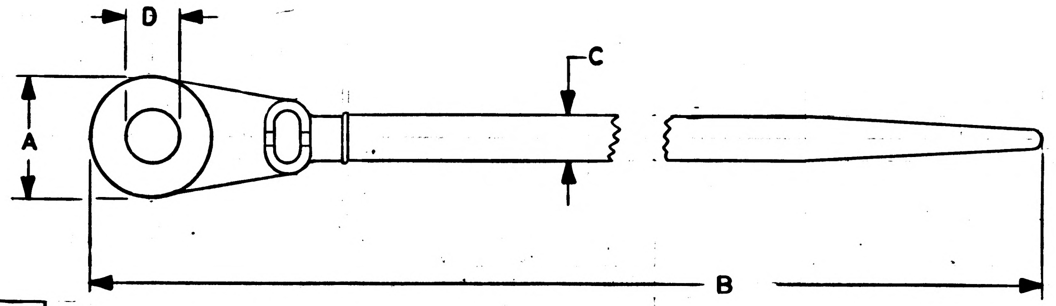
DASH NO.	A	B MIN	C	D	SELF CLINCHING	WIRE BUNDLE DIAMETER RANGE (INCHES)	MINIMUM TENSILE UNLOCKING STRENGTH PSI
-1	.44 .42	7.81	.20 .18	.196 .203	-	1/16 TO 1-3/4	50
-2	.44 .42	7.75	.20 .18	.196 .203	X	1/16 TO 1-3/4	50
-3	.23 .21	4.00	.098 .088	.116 .125	-	1/16 TO 5/8	25
-4	.54 .52	13.93	.31 .29	.261 .272	-	3/16 TO 3-3/4	125
-5	.54 .52	13.93	.31 .29	.261 .272	X	3/16 TO 3-3/4	125



SELF CLINCHING CONFIGURATION FOR 1006697-5



SELF CLINCHING CONFIGURATION FOR 1006697-2



CONFIGURATION FOR 1006697-1, 1006697-3 AND 1006697-4

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO 06456 DATE 2/18/64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J.D./S.T. DATE 23 JAN 64
CHECKED W. J. Gifford HBM 27 JAN 64
APPROVAL K. Moore JPK 7 FEB 64
APPROVAL JDS
APPROVAL J. I. Pemberton RFB 2/6/64
NASA APPROVAL 2/18/64
MIT APPROVAL 2/18/64
MIT APPROVAL 2-17-64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CLAMP, LOOP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006697
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS 03038

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	WHC
A	REVISED PER TDRR 04904	12/10/63	EPK

NOTES:

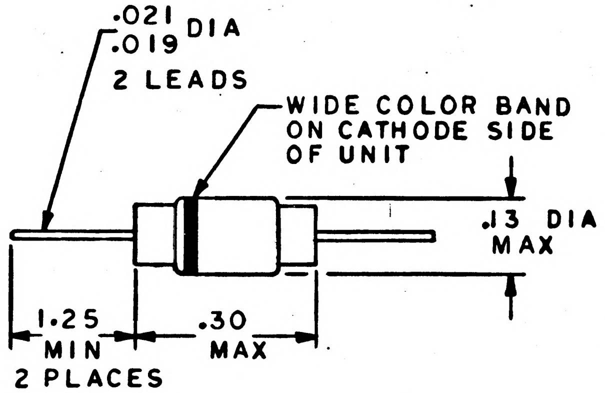
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002054.
   - E. PACKING AND PACKAGING: UNIT PACKING AND PACKAGING IN ACCORDANCE WITH LEVEL A OF MIL-S-19491.
   - F. MARKING: UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME/OR SYMBOL AND TYPE DESIGNATION; THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER SHALL ALSO BE INCLUDED. UNITS SHALL BE MARKED WITH THE MANUFACTURER'S SYMBOL/OR TYPE DESIGNATION WITH A BLACK BAND DENOTING CATHODE END.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE IRON-NICKEL ALLOY PER ND PS 1015401: MATERIAL CERTIFICATION MUST ACCOMPANY EACH SHIPMENT.
     - (2) LEAD BEND TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD BEND TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION E. A WEIGHT OF 16 ± 1 OUNCES SHALL BE APPLIED TO EACH LEAD.

       LEAD PULL TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD PULL TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A WITH A STRAIGHT AXIAL PULL OF FOUR (4) POUNDS MINIMUM FOR ONE (1) MINUTE.

       NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THESE TESTS.
     - (3) REVERSE LEAKAGE CURRENT (I_R) PER TABLE I.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: UNITS SHALL BE CAPABLE OF 2000 HOURS MINIMUM OPERATION WITHIN THE PRESCRIBED LIMITS.
   - B. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE WITHOUT ANY MECHANICAL OR ELECTRICAL DETERIORATION.
   - C. CONSTRUCTION: HERMETICALLY SEALED. FUSED GLASS TO METAL AND WELDED METAL TO METAL SEALS.
   - D. CAPACITANCE CHANGE VS. TEMPERATURE: CHANGE IN CAPACITANCE AT -2.0 VOLTS ± 5% FROM 0°C TO 80°C SHALL BE LESS THAN 5%.

TABLE I

DASH NO.	CAPACITANCE @ 1MC PICOFARADS ± 2% AT 4VDC ± .5V	CAPACITANCE RANGE PICOFARADS @ 1MC		DC WORKING VOLTS - MAX	QUALITY FACTOR AT 50 MC			I_R @ 10VDC AND 80°C NANOAMPS MAX
		AT 20VDC	AT 0.1VDC		AT 4VDC MINIMUM	AT 4VDC TYPICAL	AT MAX WV TYPICAL	
-1	47	≤ 25	≥ 106	20	7.0	15	32	10



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN M. C. Crespi DATE 5 Sep 63
CHECKED J. Ruggeri / H. Maynard 5 Sept 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/19/63
MIT APPROVAL 10 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE
VOLTAGE VARIABLE CAPACITOR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006700
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

		REVISIONS 03038		
1006700	SYM	DESCRIPTION	DATE	APPROVAL
	-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	WK

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NOTES:

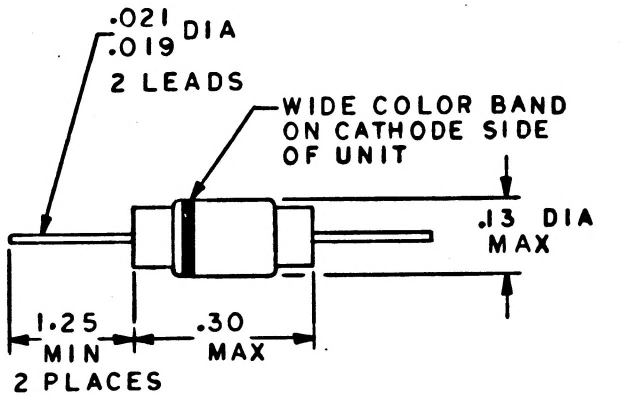
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002054.
   - E. PACKING AND PACKAGING: UNIT PACKING AND PACKAGING IN ACCORDANCE WITH LEVEL A OF MIL-S-19491.
   - F. MARKING: UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME/OR SYMBOL AND TYPE DESIGNATION; THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER SHALL ALSO BE INCLUDED. UNITS SHALL BE MARKED WITH THE MANUFACTURER'S SYMBOL/OR TYPE DESIGNATION WITH A BLACK BAND DENOTING CATHODE END.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE IRON-NICKEL ALLOY PER ND PS 1015401. MATERIAL CERTIFICATION MUST ACCOMPANY EACH SHIPMENT.
     - (2) LEAD BEND TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD BEND TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION E. A WEIGHT OF 16 ± 1 OUNCES SHALL BE APPLIED TO EACH LEAD.

       LEAD PULL TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD PULL TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A WITH A STRAIGHT AXIAL PULL OF FOUR (4) POUNDS MINIMUM FOR ONE (1) MINUTE.

       NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THESE TESTS.
     - (3) REVERSE LEAKAGE CURRENT (I_R) PER TABLE I.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: UNITS SHALL BE CAPABLE OF 2000 HOURS MINIMUM OPERATION WITHIN THE PRESCRIBED LIMITS.
   - B. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE WITHOUT ANY MECHANICAL OR ELECTRICAL DETERIORATION.
   - C. CONSTRUCTION: HERMETICALLY SEALED. FUSED GLASS TO METAL AND WELDED METAL TO METAL SEALS.
   - D. CAPACITANCE CHANGE VS. TEMPERATURE: CHANGE IN CAPACITANCE AT -2.0 VOLTS ± 5% FROM 0°C TO 80°C SHALL BE LESS THAN 5%.

TABLE I

DASH NO.	CAPACITANCE ● 1MC PICOFARADS ± 2% AT 4VDC ±.5V	CAPACITANCE RANGE PICOFARADS ● 1MC		DC WORKING VOLTS - MAX	QUALITY FACTOR AT 50 MC			I_R ● [illegible]0VDC AND 80°C NANOAMPS MAX
		AT 20VDC	AT 0.1VDC		AT 4VDC MINIMUM	AT 4VDC TYPICAL	AT MAX WV TYPICAL	
-1	47	≤ 24	≥ 120	20	7.0	15	32	5



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN M. C. Cesp DATE 5 Sept 63
CHECKED J. Ruggeri / H. Maynard
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL 10 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE
VOLTAGE VARIABLE CAPACITOR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006700
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

1006701 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 02970	9/5/63	
A	REVISED PER TDRR 03997	10/1/71	WK

M

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002054.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL CHARACTERISTICS:

(1) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH THE JEDEC TYPE NUMBER AND POLARITY. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

(2) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY (DUMET) IN ACCORDANCE WITH PS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(3) TERMINAL STRENGTH: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD TENSION TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A, WITH A STRAIGHT AXIAL PULL OF FOUR (4) POUNDS MINIMUM FOR ONE (1) MINUTE.

SAMPLE IN ACCORDANCE WITH MIL-STD-105C INSPECTION LEVEL I AQL OF 4 PERCENT.

NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

(4) DIMENSIONS; PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105 C INSPECTION LEVEL I AQL OF 4 PERCENT.

B. ELECTRICAL CHARACTERISTICS: (100% INSPECTION PER TABLE I)

(1) ZENER VOLTAGE: V_Z

(2) ZENER VOLTAGE CHANGE: ΔV_Z

(3) ZENER IMPEDANCE: Z_{ZT}; Z_{ZK}

(4) LEAKAGE CURRENT: I_R

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS:

(1) ZENER CURRENT: 125 MILLIAMPERES DC.

(2) D.C. POWER DISSIPATION: 1.5 WATTS @ CASE TEMP OF 25°C

TABLE I

ELECTRICAL CHARACTERISTICS AT 25°C AMBIENT TEMPERATURE UNLESS OTHERWISE SPECIFIED

PARAMETER	CONDITIONS	SYMBOL	LIMITS		UNITS
			MIN	MAX	
ZENER VOLTAGE	I_{ZT} = 37 MA	V_Z	9.5	10.5	VOLTS
ZENER IMPEDANCE	I_{ZT} = 37 MA	Z_{ZT}	—	5	OHMS
	I_{ZK} = 0.25 MA	Z_{ZK}	—	700	OHMS
LEAKAGE CURRENT	V_R = 7.6 V	I_R	—	5	MICROAMPERES
ZENER VOLTAGE CHANGE	V_{Z_1} @ I = 0.25MA V_{Z_2} @ I = 37MA $\Delta V_Z = V_{Z_2} - V_{Z_1}$	ΔV_Z	—	0.5	VOLTS

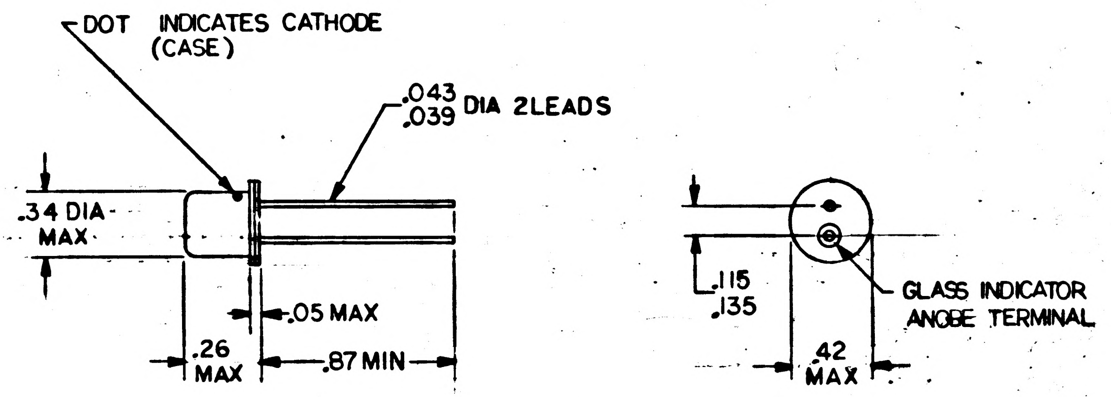
(3) JUNCTION AND STORAGE TEMPERATURE: -65°C TO +175°C.

(4) THERMAL RESISTANCE: 60°C/W JUNCTION TO AMBIENT.
TEMPERATURE COEFFICIENT: 5.5 MV/°C
DERATING: 10MW/°C CASE TEMP

4. BURN IN:

A. UNITS SHALL BE BURNED IN FOR A PERIOD OF 240 HOURS AT 300 MILLIWATTS POWER DISSIPATION.

UNITS SHALL MEET ALL REQUIREMENTS OF TABLE I AFTER BURN-IN.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 6 Aug 63
CHECKED 17 July 63
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL
MIT APPROVAL 9/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006701
SCALE NONE
WT
SHEET 1 OF 1

4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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—	1006701

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 02970	9/5/63	JW

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002054.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL CHARACTERISTICS:

(1) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH THE JEDEC TYPE NUMBER AND POLARITY. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

(2) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY (DUMET) IN ACCORDANCE WITH PS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(3) TERMINAL STRENGTH: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD TENSION TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A, WITH A STRAIGHT AXIAL PULL OF FOUR (4) POUNDS MINIMUM FOR ONE (1) MINUTE.

SAMPLE IN ACCORDANCE WITH MIL-STD-105C INSPECTION LEVEL I AQL OF 4 PERCENT.

NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

(4) DIMENSIONS; PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105 C INSPECTION LEVEL I AQL OF 4 PERCENT.

B. ELECTRICAL CHARACTERISTICS: (100% INSPECTION PER TABLE I)

(1) ZENER VOLTAGE: V_Z

(2) ZENER VOLTAGE CHANGE: ΔV_Z

(3) ZENER IMPEDANCE: Z_{ZT}; Z_{ZK}

(4) LEAKAGE CURRENT: I_R

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS:

(1) ZENER CURRENT: 125 MILLIAMPERES DC.

(2) D.C. POWER DISSIPATION: 1.5 WATTS @ CASE TEMP OF 25°C

TABLE I

ELECTRICAL CHARACTERISTICS AT 25°C AMBIENT TEMPERATURE UNLESS OTHERWISE SPECIFIED

PARAMETER	CONDITIONS	SYMBOL	LIMITS		UNITS
			MIN	MAX	
ZENER VOLTAGE	I_{ZT} = 37 MA	V_Z	9.5	10.5	VOLTS
ZENER IMPEDANCE	I_{ZT} = 37 MA	Z_{ZT}	—	5	OHMS
	I_{ZK} = 0.25 MA	Z_{ZK}	—	700	OHMS
LEAKAGE CURRENT	V_R = 7.6 V	I_R	—	5	MICROAMPERES
ZENER VOLTAGE CHANGE	V_{Z_1} @ I = 0.25MA V_{Z_2} @ I = 37MA $\Delta V_Z = V_{Z_2} - V_{Z_1}$	ΔV_Z	—	0.5	VOLTS

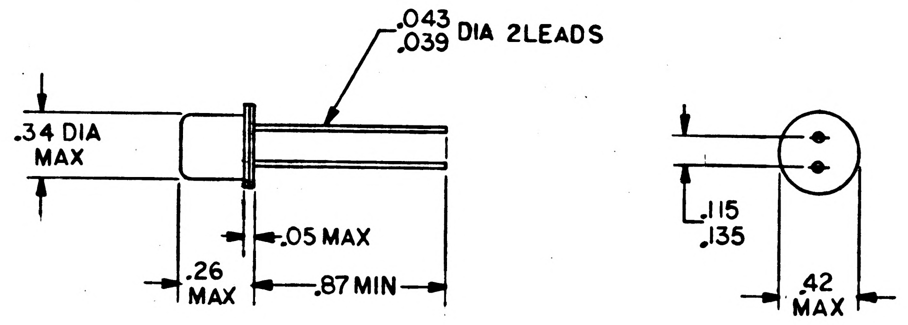
(3) JUNCTION AND STORAGE TEMPERATURE: -65°C TO +175°C.

(4) THERMAL RESISTANCE: 60°C/W JUNCTION TO AMBIENT.
TEMPERATURE COEFFICIENT: 5.5 MV/°C
DERATING: 10MW/°C CASE TEMP

4. BURN IN:

A. UNITS SHALL BE BURNED IN FOR A PERIOD OF 240 HOURS AT 300 MILLIWATTS POWER DISSIPATION.

UNITS SHALL MEET ALL REQUIREMENTS OF TABLE I AFTER BURN-IN.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN H. Prunier DATE 16 JULY 63
CHECKED A.J. Marinaro / A. Maynard 17 July '63
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 7/5/63
MIT APPROVAL 9/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006701
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

102192 -7-24-63

1006702 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02192	-	WK.
A	UPGRADED TO CLASS A RELEASE PER TDRR 04818	24Jul63	WK.

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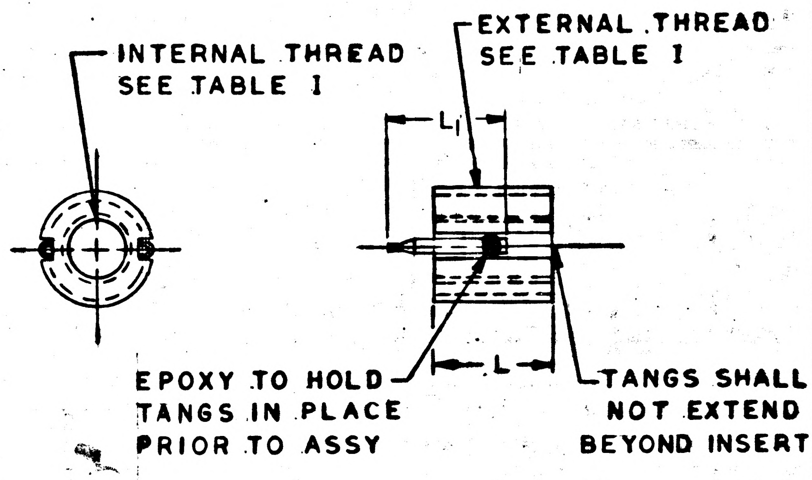
REQUIREMENTS:

1. GENERAL:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
    - C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
2. ACCEPTANCE AND INSPECTION:
    - A. MECHANICAL PROPERTIES:
        - (1) DIMENSIONS AND TOLERANCE: SEE TABLE I.
        - (2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.
        - (3) FINISH: PASSIVATED PER MIL-S-5002.
        - (4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.
3. DESIGN:
    - A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027.
    - B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L-25504.

TABLE I

DASH NO.	DIMENSIONS			
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP DRILL DIA REF
-1	2-56UNC-3B	8-32UNC-2A	.12	.144
-2	4-40UNC-3B	10-32UNF-2A	.16	.166
-3	6-32UNC-3B	12-28UNF-2A	.19	.191
-4	2-56UNC-3B	6-32UNC-2A MOD	.10	.125
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.18	.234


INTERNAL THREAD SEE TABLE I
EXTERNAL THREAD SEE TABLE I
L_1
L
EPOXY TO HOLD TANGS IN PLACE PRIOR TO ASSY
TANGS SHALL NOT EXTEND BEYOND INSERT

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Joe C. Crespi DATE 18Jun63
CHECKED J. Rugini
APPROVAL D.B. Test 7/22/63
APPROVAL
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, THREADED, SELF LOCKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006702
SCALE NONE
WT
SHEET 1 OF 1

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

1 02192 -7-24-63

1006702 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02192		WK.
A	UPGRADED TO CLASS A RELEASE PER TDRR 04818	24 Nov 63	WK
B	REVISED PER TDRR 06537		EPK WK

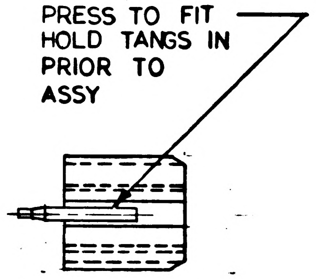
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

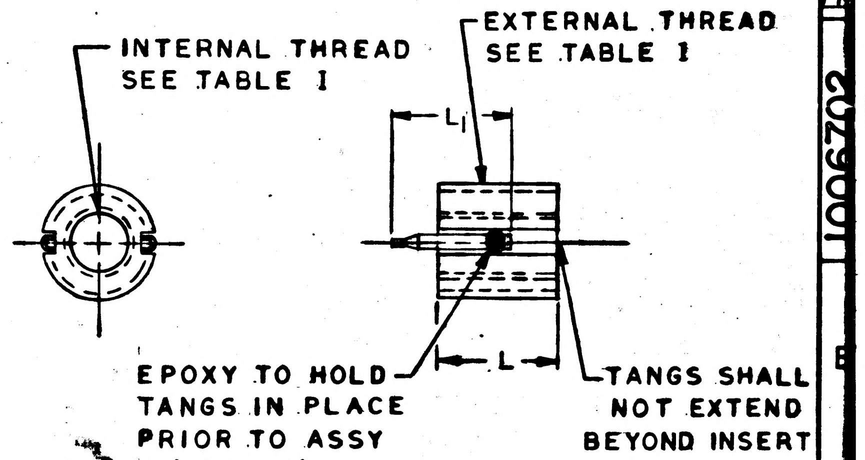
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS AND TOLERANCE: SEE TABLE I.
     - (2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.
     - (3) FINISH: PASSIVATED PER MIL-S-5002.
     - (4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.
3. DESIGN:
   - A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027.
   - B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L-25504.

TABLE I

DASH NO.	DIMENSIONS			
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP DRILL DIA REF
-1	2-56UNC-3B	8-32UNC-2A	.12	.144
-2	4-40UNC-3B	10-32UNF-2A	.16	.166
-3	6-32UNC-3B	12-28UNF-2A	.19	.191
-4	2-56UNC-3B	6-32UNC-2A MOD	.10	.125
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.18	.234



ALTERNATE METHOD OF KEE RETENTION (FOR SHIPMENT ONLY)



MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE
CHECKED
APPROVAL 7/22/63
APPROVAL
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, THREADED, SELF LOCKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006702
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006702 C

1o2192 -7-24-63

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02192		WK.
A	UPGRADED TO CLASS A RELEASE PER TDRR 04818	24 Nov 63	WK
B	REVISED PER TDRR 06537		RPK WK
C	REVISED PER TDRR 07942	5 May 64	WK

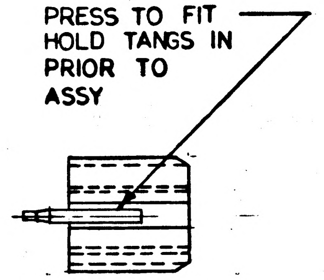
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

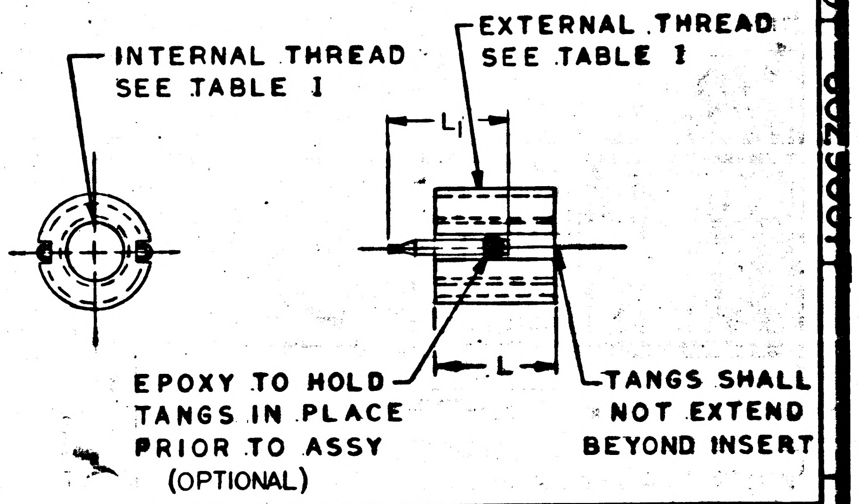
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS AND TOLERANCE: SEE TABLE I.
     - (2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.
     - (3) FINISH: PASSIVATED PER MIL-S-5002.
     - (4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.
3. DESIGN:
   - A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027.
   - B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L-25504.
4. ENGINEERING REFERENCE INFORMATION:
   - 4.1 WHEN INSTALLING INSERTS IN BERYLLIUM USE TAP HOLE SIZE IN COLUMN B. FOR OTHER SOFTER MATERIALS USE TAP HOLE SIZE IN COLUMN A.

TABLE I

DASH NO.	DIMENSIONS				
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP HOLE SIZE COLUMN A SEE NOTE 4	COLUMN B
-1	2-56UNC-3B	8-32UNC-2A	.12	.143-.147	
-2	4-40UNC-3B	10-32UNF-2A	.16	.165-.169	.166-.168
-3	6-32UNC-3B	12-28UNF-2A	.19	.190-.194	.195-.197
-4	2-56UNC-3B	6-32UNC-2A MOD	.10	.124-.128	
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.18	.233-.237	.240-.242



ALTERNATE METHOD
OF KEE RETENTION
(FOR SHIPMENT ONLY)



MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J. C. Grasp DATE
CHECKED J. Rugu
APPROVAL 7/22/63
APPROVAL
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, THREADED, SELF LOCKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006702
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1 02192 - 7-24-63

1006702 D

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02192		WK
A	UPGRADED TO CLASS A RELEASE PER TDRR 04818	24 Nov 63	WK
B	REVISED PER TDRR 06537		RRK WK
C	REVISED PER TDRR 07942	5 May 64	WK
D	REVISED PER TDRR 13427	10/29/64	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS AND TOLERANCE: SEE TABLE I.

(2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.

(3) FINISH: PASSIVATED PER MIL-S-5002.

(4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.

3. DESIGN:

A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027.

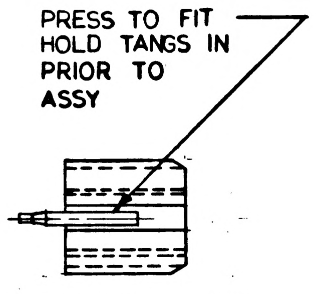
B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L-25504.

4. ENGINEERING REFERENCE INFORMATION:

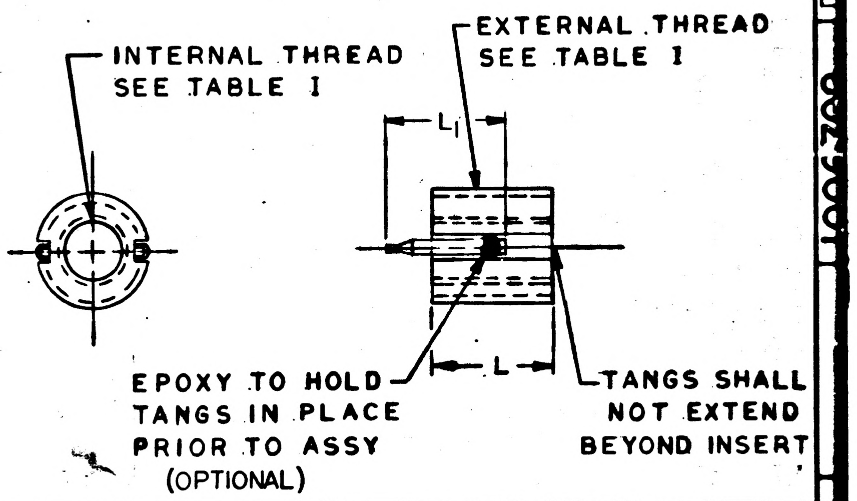
4.1 WHEN INSTALLING INSERTS IN BERYLLIUM USE TAP HOLE SIZE IN COLUMN B. FOR OTHER SOFTER MATERIALS USE TAP HOLE SIZE IN COLUMN A.

TABLE I

DASH NO.	DIMENSIONS				
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP HOLE SIZE COLUMN A SEE NOTE 4	COLUMN B
-1	2-56UNC-3B	8-32UNC-2A	.12	.143-.147	
-2	4-40UNC-3B	10-32UNF-2A	.16	.165-.169	.166-.168
-3	6-32UNC-3B	12-28UNF-2A	.19	.186-.190	.195-.197
-4	2-56UNC-3B	6-32UNC-2A MOD	.10	.124-.128	
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.18	.227-.231	.240-.242



ALTERNATE METHOD
OF KEE RETENTION
(FOR SHIPMENT ONLY)



MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 18 June 63
CHECKED
APPROVAL 7/22/63
APPROVAL
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, THREADED, SELF LOCKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006702
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

102192 - 7-24-63

1006702 E

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02192		WK.
A	UPGRADED TO CLASS A RELEASE PER TDRR 04818	24 Nov 63	WK
B	REVISED PER TDRR 06537		EOK WK
C	REVISED PER TDRR 07942	5 May 64	WK
D	REVISED PER TDRR 13427	10/20/64	
E	REVISED PER TDRR 14832	1-24-64	WK

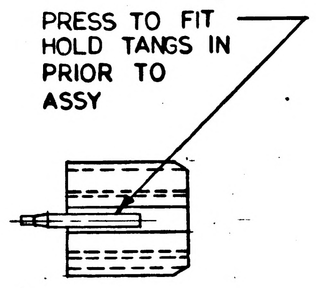
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

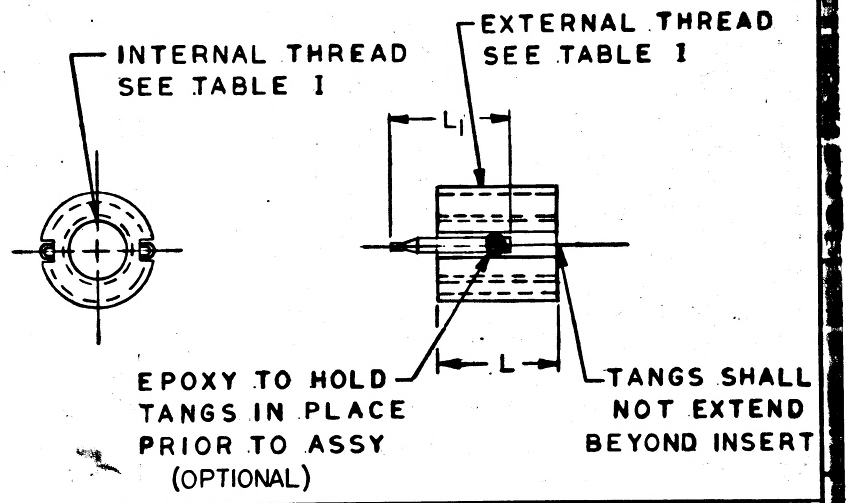
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS AND TOLERANCE: SEE TABLE I.
     - (2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.
     - (3) FINISH: PASSIVATED PER MIL-S-5002.
     - (4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.
3. DESIGN:
   - A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027.
   - B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L- 8937
4. ENGINEERING REFERENCE INFORMATION:
   - 4.1 WHEN INSTALLING INSERTS IN BERYLLIUM USE TAP HOLE SIZE IN COLUMN B. FOR OTHER SOFTER MATERIALS USE TAP HOLE SIZE IN COLUMN A.

TABLE I

DASH NO.	DIMENSIONS				
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP HOLE SIZE COLUMN A	TAP HOLE SIZE COLUMN B (SEE NOTE 4)
-1	2-56UNC-3B	8-32UNC-2A	.12	.143-.147	
-2	4-40UNC-3B	10-32UNF-2A	.16	.165-.169	.166-.168
-3	6-32UNC-3B	12-28UNF-2A	.175	.186-.190	.195-.197
-4	2-56UNC-3B	6-32UNC-2A MOD	.10	.124-.128	
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.175	.227-.231	.240-.242



ALTERNATE METHOD OF KEE RETENTION (FOR SHIPMENT ONLY)



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN J. C. Crespi DATE 18 June 63
CHECKED
APPROVAL 7/22/63
APPROVAL
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, THREADED, SELF LOCKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006702
SCALE NONE WT SHEET 1 OF 1

1 02192 - 7-24-63

1006702 F

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02192		WK.
A	UPGRADED TO CLASS A RELEASE PER TDRR 04818	24 Nov 63	WK.
B	REVISED PER TDRR 06537		eok WK
C	REVISED PER TDRR 07942	5 May 64	WK
D	REVISED PER TDRR 13427	10/20/64	
E	REVISED PER TDRR 14832	12-24-64	WK
F	REVISED PER TDRR 24685	12/24/65	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS AND TOLERANCE: SEE TABLE I.

      (2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.

      (3) FINISH: PASSIVATED PER MIL-S-5002.

      (4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.

3. DESIGN:

   A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027.

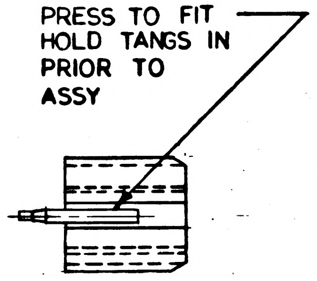
   B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L-8937

4. ENGINEERING REFERENCE INFORMATION:

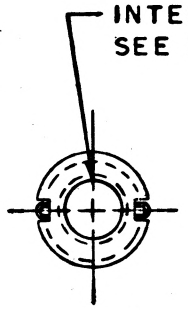
   4.1 WHEN INSTALLING INSERTS IN BERYLLIUM USE TAP HOLE SIZE IN COLUMN B. FOR OTHER SOFTER MATERIALS USE TAP HOLE SIZE IN COLUMN A.

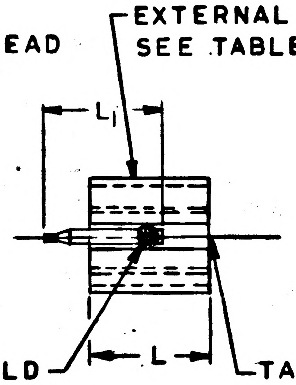
TABLE I

DASH NO.	DIMENSIONS				
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP HOLE SIZE COLUMN A SEE NOTE 4	TAP HOLE SIZE COLUMN B SEE NOTE 4
-1	2-56UNC-3B	8-32UNC-2A	.12	.143-.147	.146-.148
-2	4-40UNC-3B	10-32UNF-2A	.16	.160-.164	.166-.168
-3	6-32UNC-3B	12-28UNF-2A	.170	.186-.190	.195-.197
-4	2-56UNC-3B	6-40UNF-3A	.10	.119-.122	.124-.126
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.170	.227-.231	.240-.242



ALTERNATE METHOD
OF KEE RETENTION
(FOR SHIPMENT ONLY)





MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 18 Jun 63
CHECKED
APPROVAL 7/22/63
APPROVAL
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, THREADED, SELF LOCKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006702
SCALE NONE
WT
SHEET 1 OF 1

102192 -7-24-63

1006702 G

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02/92		wk.
A	UPGRADED TO CLASS A RELEASE PER TDRR 04818	24 Nov 63	wk
B	REVISED PER TDRR 06537		wk
C	REVISED PER TDRR 07942	5 Jan 64	WK
D	REVISED PER TDRR 13427	6/26/64	
E	REVISED PER TDRR 14832		wk
F	REVISED PER TDRR 24685	12/14/65	wk
G	REVISED PER TDRR 27681	4/5/66	wk

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

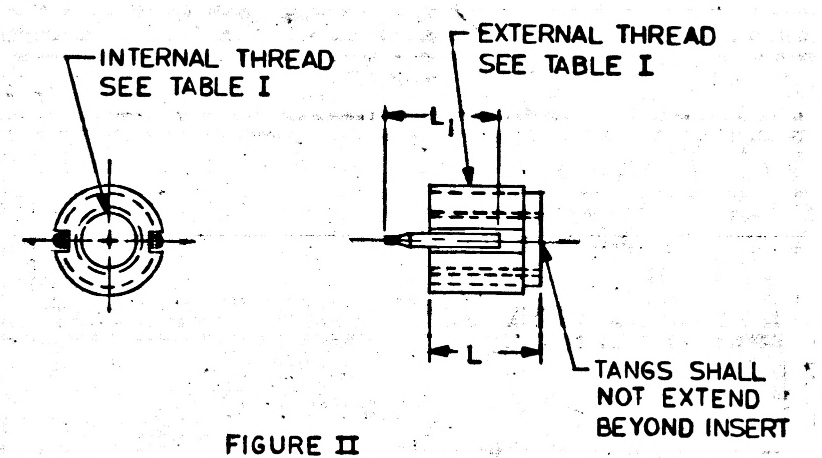
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS AND TOLERANCE: SEE TABLE I.
     - (2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.
     - (3) FINISH: PASSIVATED PER MIL-S-5002.
     - (4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.
3. DESIGN:
   - A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027. (SELF-LOCKING ONLY)
   - B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L-8937 (SELF-LOCKING ONLY)
4. ENGINEERING REFERENCE INFORMATION:
   - 4.1 WHEN INSTALLING INSERTS IN BERYLLIUM USE TAP HOLE SIZE IN COLUMN B. FOR OTHER SOFTER MATERIALS USE TAP HOLE SIZE IN COLUMN A.

TABLE I

DASH NO.	DIMENSIONS					FIGURE
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP HOLE SIZE SEE NOTE 4 COLUMN A	COLUMN B	
-1	2-56UNC-3B	8-32UNC-2A	.12	.143-.147	.146-.148	I
-2	4-40UNC-3B	10-32UNF-2A	.16	.160-.164	.166-.168	I
-3	6-32UNC-3B	12-28UNF-2A	.170	.186-.190	.195-.197	I
-4	2-56UNC-3B	6-40UNF-3A	.10	.119-.122	.124-.126	I
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.170	.227-.231	.240-.242	I
-6	2-56UNC-3B	8-32UNC-2A	.12	.139-.143	.146-.148	II
-7	4-40UNC-3B	10-32UNF-2A	.16	.160-.164	.166-.168	II
-8	6-32UNC-3B	12-28UNF-2A	.170	.186-.190	.195-.197	II
-9	2-56UNC-3B	6-40UNF-3A	.10	.119-.122	.124-.126	II
-10	8-32UNC-3B	1/4-28UNF-2A MOD.	.170	.227-.231	.240-.242	II

FIGURE I
(SELF LOCKING)



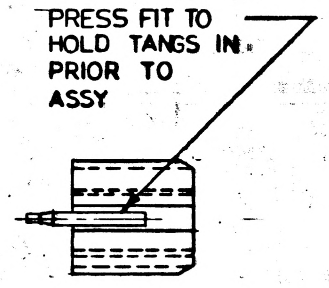
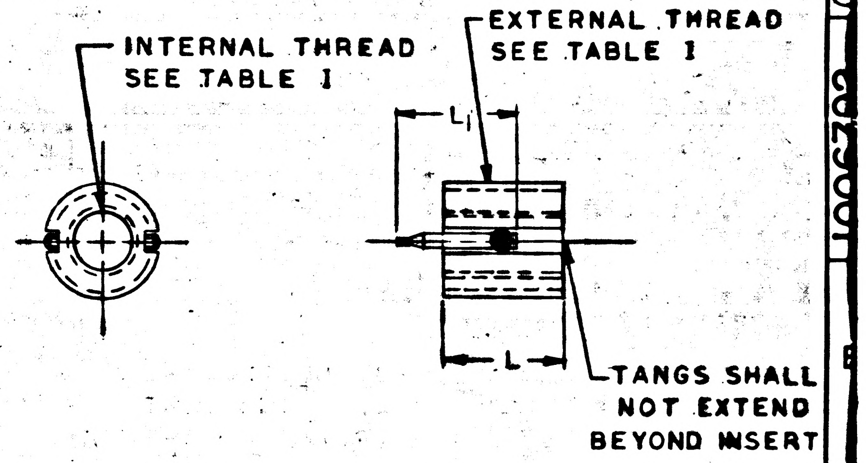


FIGURE II
(NON SELF LOCKING)



MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J. C. Crespi DATE 18 June 63
CHECKED
APPROVAL 7/22/63
APPROVAL

NASA APPROVAL 7/24/63

MIT APPROVAL W Kupfer 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, THREADED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006702
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006702

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS B PER TDRR 02192		

REQUIREMENTS:

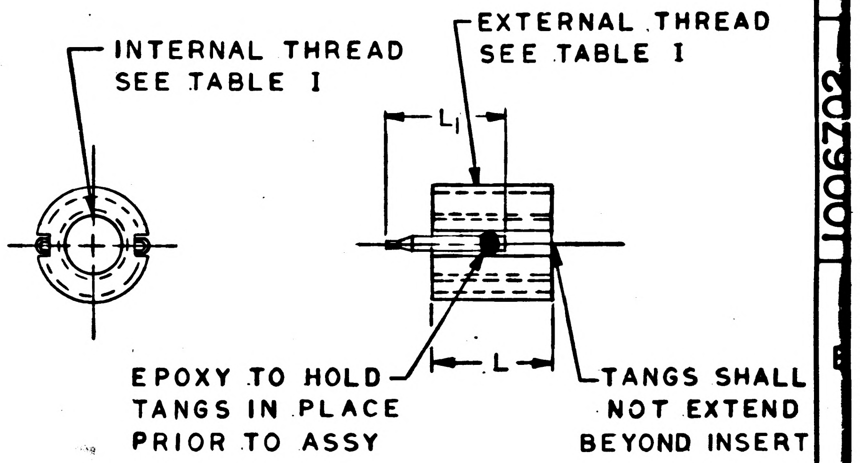
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY OF PARTS, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS AND TOLERANCE: SEE TABLE I.
     - (2) MATERIAL: INSERT AND TANG, CORROSION RESISTANT STEEL IN ACCORDANCE WITH MIL-S-7720, CLASS 303, CONDITION B.
     - (3) FINISH: PASSIVATED PER MIL-S-5002.
     - (4) INTERNAL THREADS SHALL CONFORM TO MIL-S-7742.
3. DESIGN:
   - A. LOCKING TORQUE SHALL BE AS SPECIFIED BY MIL-N-25027.
   - B. SHALL HAVE A DRY FILM LUBRICANT PER MIL-L-25504.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02192 DATE 7/24/63

TABLE I

DASH NO.	DIMENSIONS			
	INTERNAL THREAD	EXTERNAL THREAD	L & L_1 ±.010	TAP DRILL DIA REF
-1	2-56UNC-3B	8-32UNC-2A	.12	.144
-2	4-40UNC-3B	10-32UNF-2A	.16	.166
-3	6-32UNC-3B	12-28UNF-2A	.19	.191
-4	2-56UNC-3B	6-32UNC-2A MOD	.10	.125
-5	8-32UNC-3B	1/4-28UNF-2A MOD	.18	.234


INTERNAL THREAD SEE TABLE I
EXTERNAL THREAD SEE TABLE I
L_1
L
EPOXY TO HOLD TANGS IN PLACE PRIOR TO ASSY
TANGS SHALL NOT EXTEND BEYOND INSERT

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.W. C. Crespi DATE 18 Jun 63
CHECKED J. Riggin
APPROVAL D. A. Test 7/22/63
APPROVAL
NASA APPROVAL [illegible] 7/24/63
MIT APPROVAL W Kupfer 24 July 63

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HOUSTON, TEXAS

INSERT, THREADED, SELF LOCKING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006702
SCALE NONE WT SHEET 1 OF 1

1006702

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

—	1006708

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 02617	8/14/63	WH

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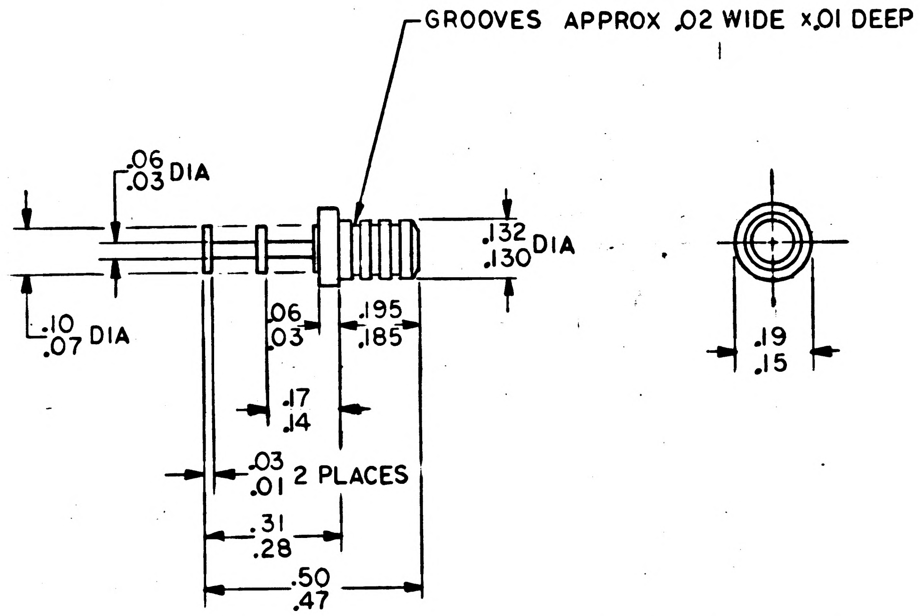
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE QUANTITY ENCLOSED, MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.

3. DESIGN:
   - A. MATERIAL OF TERMINAL LUG: BRASS PER QQ-B-626, COMPOSITION 22, 1/2 HARD.
   - B. FINISH: SOLDER (40 TO 70 PERCENT TIN)
     ELECTROPLATE .0003 MINIMUM THICK SILVER.
   - C. MATERIAL OF BASE: POLYTETRAFLUOROETHYLENE PER MIL-P-14078.
   - D. A CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENTS SHALL BE SUPPLIED WITH EACH SHIPMENT.
   - E. ELECTRICAL CHARACTERISTICS:
     - (1) VOLTAGE RATING: 1000 VOLTS MINIMUM.
     - (2) CAPACITANCE: 0.60 MICROMICROFARADS MAXIMUM.
     - (3) FLASHOVER VOLTAGE (SEA LEVEL): 3000 VOLTS MINIMUM.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J&D H. Pennill DATE 26 JUNE 63
CHECKED J. Ruggeri / H. Maynard 25 July '63
APPROVAL
APPROVAL Eldon C. Hall 15 Aug 63
NASA APPROVAL W J Rhine 8-14-63
MIT APPROVAL W Kupfer 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, STUD
INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006708
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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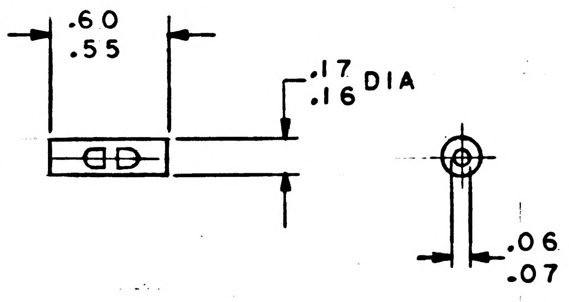
REVISIONS 02821			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY ENCLOSED IN EACH CONTAINER.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) SHALL BE CAPABLE OF CARRYING THE MAXIMUM CURRENT FOR A #14 WIRE - 11 AMPERES.

3. DESIGN:
   - A. MATERIAL: COPPER PER QQ-C-576, TIN PLATED PER MIL-T-10727A. A CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL BE INCLUDED WITH EACH SHIPMENT.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.D.H. DATE 29 July 63
CHECKED 26 July 63 W. Maynard
APPROVAL 23 Aug 63
APPROVAL Eldon C. Hall 23 Aug 63
NASA APPROVAL
MIT APPROVAL 8/25/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SPLICE, CONDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006710
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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A 1006711

REVISIONS TDRR 01924

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03704	8Oct63	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404 CLASS 3.
   - C. THE WIRE SHALL BE IN ACCORDANCE WITH ND 1002116.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) SIZES PER TABLE I.
     - (2) MARKING: PER ND1002116
     - (3) PACKAGING: PER ND1002116
3. DESIGN REQUIREMENTS:
   - A. THE WIRE SHALL BE COPPER WITH A PRIMARY INSULATION OF POLYURETHANE AND AN EXTERNAL JACKET OF NYLON AS SPECIFIED IN ND 1002116.

TABLE I

	NASA DRAWING DASH NUMBER			
AWG SIZE	TYPE-I	TYPE-II	TYPE-III	TYPE-IV
23	-1	-12	-23	-34
30	-2	-13	-24	-35
31	-3	-14	-25	-36
33	-4	-15	-26	-37
34	-5	-16	-27	-38
35	-6	-17	-28	-39
36	-7	-18	-29	-40
37	-8	-19	-30	-41
38	-9	-20	-31	-42
39	-10	-21	-32	-43
41	-11	-22	-33	-44
20	-45	-46	-47	-48

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Geo J Boss DATE 25 Jun 63
CHECKED H M Levenson 7/3/63
APPROVAL Geo Mayo 7/3/63
APPROVAL
NASA APPROVAL W J Swartz 7/3/63
MIT APPROVAL W Kupfer 3 Jul 63

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HOUSTON, TEXAS

WIRE, MAGNET, ELECTRICAL
(POLYURETHANE INSULATION WITH NYLON JACKET)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006711
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006711

REVISIONS TDRR 01924

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03704	8Oct63	WK
B	REVISED PER TDRR 05221	20Dec63	WK

(1)

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404 CLASS 3.
   - C. THE WIRE SHALL BE IN ACCORDANCE WITH ND 1002116.
   - D. COLOR SHALL BE AS INDICATED ON PURCHASE ORDER
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) SIZES PER TABLE I. OR TABLE II
     - (2) MARKING: PER ND1002116
     - (3) PACKAGING: PER ND1002116
3. DESIGN REQUIREMENTS:
   - A. THE WIRE SHALL BE COPPER WITH A PRIMARY INSULATION OF POLYURETHANE AND MAY HAVE AN EXTERNAL JACKET OF NYLON AS SPECIFIED IN ND 1002116.
4. ORDERING DATA:
   - (1). CLASS A WIRE (PER ND1002116) SHALL BE ORDERED BY DASH NUMBERS FROM TABLE I.
   - (2) CLASS B WIRE (PER ND1002116) SHALL BE ORDERED BY DASH NUMBERS FROM TABLE II,

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

TABLE I
CLASS A WIRE

NASA DRAWING DASH NUMBER				
AWG SIZE	TYPE-I	TYPE-II	TYPE-III	TYPE-IV
23	-1	-12	-23	-34
30	-2	-13	-24	-35
31	-3	-14	-25	-36
33	-4	-15	-26	-37
34	-5	-16	-27	-38
35	-6	-17	-28	-39
36	-7	-18	-29	-40
37	-8	-19	-30	-41
38	-9	-20	-31	-42
39	-10	-21	-32	-43
41	-11	-22	-33	-44
20	-45	-46	-47	-48

TABLE II
CLASS B WIRE

NASA DRAWING DASH NUMBER					
AWG SIZE	DASH NO.	AWG SIZE	DASH NO.	AWG SIZE	DASH NO.
15	-49	25	-59	35	-69
16	-50	26	-60	36	-70
17	-51	27	-61	37	-71
18	-52	28	-62	38	-72
19	-53	29	-63	39	-73
20	-54	30	-64	40	-74
21	-55	31	-65	41	-75
22	-56	32	-66	42	-76
23	-57	33	-67	43	-77
24	-58	34	-68	44	-78

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 25 Jun 63
CHECKED 7/3/63
APPROVAL 7/3/63
APPROVAL
NASA APPROVAL 7/3/63
MIT APPROVAL 3 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, MAGNET, ELECTRICAL
(POLYURETHANE INSULATION WITH NYLON JACKET)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006711
SCALE NONE	WT	SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

C 1006711

REVISIONS TDRR 01924

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03704	8 Oct 63	WK
B	REVISED PER TDRR 05221	20 Dec 63	WK
C	REVISED PER TDRR 11139	4 Aug 64	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404 CLASS 3.
   - C. THE WIRE SHALL BE IN ACCORDANCE WITH ND 1002116.
   - D. COLOR SHALL BE AS INDICATED ON PURCHASE ORDER
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) SIZES PER TABLE I. OR TABLE II
     - (2) MARKING: PER ND1002116
     - (3) PACKAGING: PER ND1002116
3. DESIGN REQUIREMENTS:
   - A. THE WIRE SHALL BE COPPER WITH A PRIMARY INSULATION OF POLYURETHANE OR POLYURETHANE, NYLON JACKETED AS SPECIFIED IN ND 1002116
4. ORDERING DATA:
   - (1) CLASS B WIRE (PER ND1002116) SHALL BE ORDERED BY DASH NUMBERS FROM TABLE I.
   - (2) CLASS A WIRE (PER ND1002116) SHALL BE ORDERED BY DASH NUMBERS FROM TABLE II.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

TABLE I
CLASS B WIRE

	NASA DRAWING DASH NUMBER			
AWG SIZE	TYPE-I	TYPE-II	TYPE-III	TYPE-IV
23	-1	-12	-23	-34
30	-2	-13	-24	-35
31	-3	-14	-25	-36
33	-4	-15	-26	-37
34	-5	-16	-27	-38
35	-6	-17	-28	-39
36	-7	-18	-29	-40
37	-8	-19	-30	-41
38	-9	-20	-31	-42
39	-10	-21	-32	-43
41	-11	-22	-33	-44
20	-45	-46	-47	-48

TABLE II
CLASS A WIRE

	NASA DRAWING DASH NUMBER				
AWG SIZE	DASH NO.	AWG SIZE	DASH NO.	AWG SIZE	DASH NO.
15	-49	25	-59	35	-69
16	-50	26	-60	36	-70
17	-51	27	-61	37	-71
18	-52	28	-62	38	-72
19	-53	29	-63	39	-73
20	-54	30	-64	40	-74
21	-55	31	-65	41	-75
22	-56	32	-66	42	-76
23	-57	33	-67	43	-77
24	-58	34	-68	44	-78

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 25 Jun 63
CHECKED 7/3/63
APPROVAL 7/3/63
APPROVAL
NASA APPROVAL 7/3/63
MIT APPROVAL 3 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, MAGNET, ELECTRICAL
POLYURETHANE & POLYURETHANE NYLON
INSULATED MAGNET WIRE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006711
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006711

REVISIONS	TDRR 01924		
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404 CLASS 3.
   - C. THE WIRE SHALL BE IN ACCORDANCE WITH ND 1002116.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) SIZES PER TABLE I.
     - (2) MARKING: PER ND1002116
     - (3) PACKAGING: PER ND1002116
3. DESIGN REQUIREMENTS:
   - A. THE WIRE SHALL BE COPPER WITH A PRIMARY INSULATION OF POLYURETHANE AND AN EXTERNAL JACKET OF NYLON AS SPECIFIED IN ND 1002116.

TABLE I

	NASA DRAWING DASH NUMBER			
AWG SIZE	TYPE-I	TYPE-II	TYPE-III	TYPE-IV
23	-1	-12	-23	-34
30	-2	-13	-24	-35
31	-3	-14	-25	-36
33	-4	-15	-26	-37
34	-5	-16	-27	-38
35	-6	-17	-28	-39
36	-7	-18	-29	-40
37	-8	-19	-30	-41
38	-9	-20	-31	-42
39	-10	-21	-32	-43
41	-11	-22	-33	-44

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

1006711

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 25 Jun 63
CHECKED 7/3/63
APPROVAL 7/3/63
APPROVAL
NASA APPROVAL 7/3/63
MIT APPROVAL 3 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, MAGNET, ELECTRICAL
(POLYURETHANE INSULATION WITH NYLON JACKET)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006711
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS	03038		
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	[illegible]	WK
A	REVISED PER TDRR 06243	2-18-64	WK

NOTES:

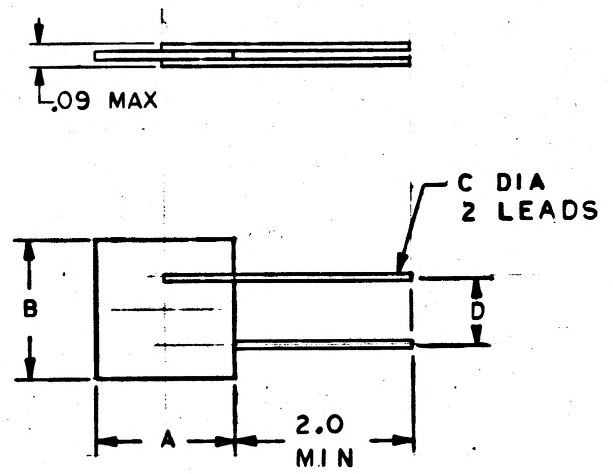
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - D. MARKING: UNIT PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) MATERIAL AND FINISH CERTIFICATION: LEAD MATERIAL AND RESISTOR MOISTURE PROOF VARNISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) RESISTANCE VALUE: TABLE I VALUE ± 1%.
     - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K} = R_{298°K}\,e^{\beta\left(\frac{1}{T} - \frac{1}{298}\right)}$ SEE TABLE II FOR β AND TABULATED VALUES OF R_T.

3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TO REACH 63% OF THE TEMPERATURE CHANGE FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



A	A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 8 Aug 63
CHECKED J. Ruggeri 19 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C. Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL 10 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR,
TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006712
SCALE NONE	WT	SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 03038

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03058	10/4/63	WIC
A	REVISED PER TDRR 06243	2-18-64	WIC

TABLE I

DASH NO.	NOMINAL RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC TC/°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C MIN	TIME CONSTANT SECONDS MIN	DIMENSIONS			
					A	B	C	D NOM
-1	500	CURVE D	2.25	5.25	.19 .11	.19 .11	.021 .019	.10
-2	1000	CURVE D	1.95	3.75	.13 .07	.13 .07	.021 .019	.10
-3	5000	CURVE F	3.225	3.95	.28 .18	.28 .18	.021 .019	.20

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$

TEMP °C	CURVE "D" β =3900±55	CURVE "E" β =3400±80	CURVE "F" β =4320±80
-60	145.2	73.04	330.3
-50	68.8	38.95	131.6
-40	34.28	21.51	56.82
-30	17.92	12.33	26.31
-20	9.792	7.307	13.20
-10	5.560	4.476	6.880
0	3.274	2.825	3.93
+10	1.992	1.830	2.159
+20	1.250	1.216	1.275
+25	1.000	1.000	1.000
+30	.8053	.8267	.7890
+40	.5316	.5742	.5000
+50	.3595	.4067	.3260
+60	.2482	.2937	.2190
+70	.1747	.2160	.1500
+80	.1252	.1615	.1050
+90	.0912	.1229	.0753
+100	.0675	.0946	.0545
+110	.0507	.0739	.0407
+120	.0386	.0584	.0298
+130	.0298	.0470	.0232
+140	.0232	.0382	.0176
+150	.0184	.0313	.0137

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 15 aug 63
CHECKED 19 aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/11/63
MIT APPROVAL 10/4/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR,
TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006712
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006712 B

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS 03038		
-	INITIAL RELEASE CLASS A PER TDRR 03038	10/?/63	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS LISTED IN TABLE III WITH REFERENCES TO MIL-T-23648 AND ND 1002057. ANY UNIT WILL BE CONSIDERED A FAILURE IF ITS ZERO-POWER RESISTANCE CHANGES BY MORE THAN 0.5% AS A RESULT OF HAVING BEEN SUBJECTED TO ANY OF THE ENVIRONMENTAL TESTS SPECIFIED. QUALIFICATION REQUIREMENTS :
   - D. MARKING: UNIT PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) MATERIAL AND FINISH CERTIFICATION: LEAD MATERIAL AND RESISTOR MOISTURE PROOF VARNISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) ZERO-POWER RESISTANCE VALUE: TABLE I VALUE ± 1%.
     - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K} = R_{298°K}\, e^{\beta\left(\frac{1}{T} - \frac{1}{298}\right)}$
       SEE TABLE II FOR β AND TABULATED VALUES OF R_T.

NOTE: BETA VALUES ARE BASED ON READINGS TAKEN AT +25° & +50°C.

3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TO REACH 63% OF THE TEMPERATURE CHANGE FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.

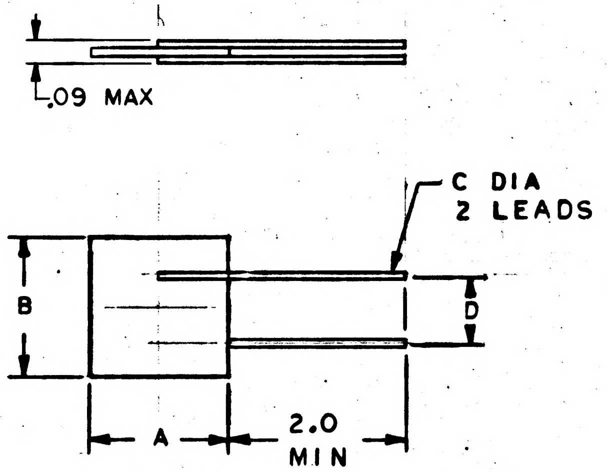
   C.

   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.
4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

SPECIAL CONDITIONING (CONT'D)

C. FOLLOWING BURN-IN. THE ZERO-POWER RESISTANCE OF EACH UNIT SHALL BE MEASURED AT THREE(3) TEMPERATURES;

0° ± 0.1°C, 25° ± 0.1°C, AND 50° ± 0.1°C. THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT. A CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF PARA. 4A AND 4B ABOVE SHALL ALSO BE SUPPLIED WITH EACH LOT SHIPPED.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 8 Aug 63
CHECKED J. Ruggeri 19 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL 10 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR,
TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006712
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006712

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03058	10/[illegible]/63	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK

TABLE I

DASH NO.	NOMINAL ZERO-POWER RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC TC/°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C MIN	TIME CONSTANT SECONDS MIN	DIMENSIONS A	B	C	D NOM
-1	500	CURVE D	2.25	5.25	.19 .11	.19 .11	.021 .019	.10
-2	1000	CURVE D	1.95	3.75	.13 .07	.13 .07	.021 .019	.10
-3	5000	CURVE F	3.225	3.95	.28 .18	.28 .18	.021 .019	.20

TABLE III

EXAMINATION OR TEST	REQUIREMENT PARAGRAPHS
GENERAL QUALIFICATION REQUIREMENTS	PARA. 3.2 THROUGH 3.9.2 OF ND - 1002057
GROUP I (ALL SAMPLES)	
VISUAL & MECHANICAL	PARA 4.2.1 OF ND -1002057
ZERO-POWER RESISTANCE	PARA 4.5.2 OF MIL-T-23648 EXCEPT MEASURE AT +25 & +50°C
DISSIPATION CONSTANT	PARA 4.5.4 OF MIL-T-23648
THERMAL TIME CONSTANT	PARA 4.5.5 OF MIL-T-23648
MAXIMUM POWER RATING	PARA 3.3.7 OF MIL-T-23648 EXCEPT MEASURE POWER THAT PRODUCES TEMPERATURE RISE OF +80°C
GROUP II (1/3 OF SAMPLES)	
RESISTANCE - TEMPERATURE CHARACTERISTICS	PARA 4.5.11 OF MIL-T-23648 EXCEPT SEQUENCE 7 WILL BE 105°C AND SEQUENCE 8 WILL NOT BE USED.
TEMPERATURE CYCLING	PARA 4.5.8 OF MIL-T-23648
THERMAL STABILITY	PARA 4.5.6 OF MIL-T-23648 EXCEPT TEMPERATURE IN PARA 4.5.6.2 WILL BE +105 ± 2°C
LOW TEMPERATURE STORAGE	PARA 4.5.7 OF MIL-T-23648 EXCEPT LOW TEMPERATURE WILL BE -55 ± 3°C
TERMINAL STRENGTH	PARA 4.5.10 OF MIL-T-23648
GROUP III (1/3 OF SAMPLES)	
VIBRATION	PARA 4.2.11 OF ND 1002057 (SEE NOTE 1)
SHOCK	PARA 4.2.12 OF ND 1002057 (SEE NOTE 1)
MOISTURE RESISTANCE	PARA 4.5.13 OF MIL-T-23648 (SEE NOTE 2)
GROUP IV (1/3 OF SAMPLES)	
LOAD LIFE	PARA 4.5.15 OF MIL-T-23648 EXCEPT INITIAL RESISTANCE MAY BE MEASURED PRIOR TO START OF LIFE. MAX OPERATING TEMPERATURE IS +105°C
LEAD COMPOSITION	PARA 4.2.16 OF ND 1002057

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$

TEMP °C	CURVE "D" β =3900±55		CURVE "F" β =4320±80
-60	145.2		330.3
-50	68.8		131.6
-40	34.28		56.82
-30	17.92		26.31
-20	9.792		13.20
-10	5.560		6.880
0	3.274		3.93
+10	1.992		2.159
+20	1.250		1.275
+25	1.000		1.000
+30	.8053		.7890
+40	.5316		.5000
+50	.3595		.3260
+60	.2482		.2190
+70	.1747		.1500
+80	.1252		.1050
+90	.0912		.0753
+100	.0675		.0545
+110	.0507		.0407

NOTE 1

THE AMOUNT OF POWER TO BE APPLIED WILL BE THAT NECESSARY TO RAISE THE THERMISTOR TEMPERATURE TO APPROX. +65°C UNDER NORMAL FREE AIR CONDITIONS. ZERO-POWER RESISTANCE WILL BE MEASURED BEFORE AND AFTER TEST PER PARA. 4.5.2. OF MIL-T-23648.

NOTE 2

INDICATED STEPS (a), (d), AND (f) REPLACED BY (1), (4), AND (7) RESPECTIVELY.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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APPROVAL A.Y. G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL [illegible] 9/16/63
MIT APPROVAL W [illegible] 10 Sep 63

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RESISTOR, TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006712
SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES 0 1 2
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1006712 C

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10/9/63	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK
C	REVISED PER TDRR 12767	4/21/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS LISTED IN TABLE III WITH REFERENCES TO MIL-T-23648 AND ND 1002057. ANY UNIT WILL BE CONSIDERED A FAILURE IF ITS ZERO-POWER RESISTANCE CHANGES BY MORE THAN 0.5% AS A RESULT OF HAVING BEEN SUBJECTED TO ANY OF THE ENVIRONMENTAL TESTS SPECIFIED.
   - D. MARKING: UNIT PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) MATERIAL AND FINISH CERTIFICATION: LEAD MATERIAL AND RESISTOR MOISTURE PROOF VARNISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) ZERO-POWER RESISTANCE VALUE: TABLE I VALUE ± 1%.
     - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K} = R_{298°K} e^{\beta\left(\frac{1}{T} - \frac{1}{298}\right)}$

       SEE TABLE II FOR β AND TABULATED VALUES OF R_T.

   NOTE: BETA VALUES ARE BASED ON READINGS TAKEN AT +25° & +50°C.

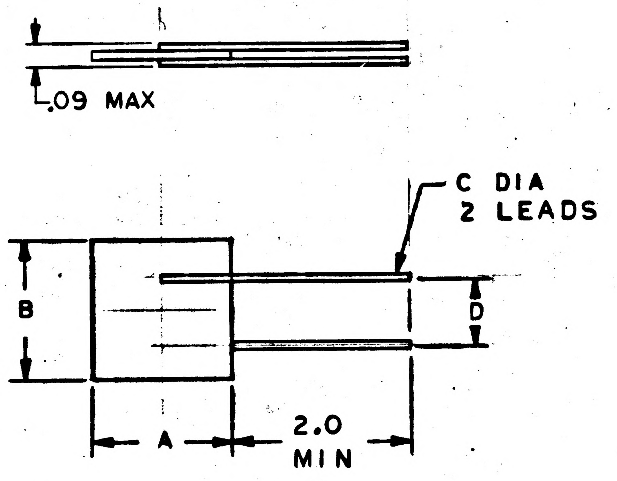
3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TO REACH 63% OF THE TEMPERATURE CHANGE FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

SPECIAL CONDITIONING (CONT'D)

C. FOLLOWING BURN-IN. THE ZERO-POWER RESISTANCE OF EACH UNIT SHALL BE MEASURED AT THREE(3) TEMPERATURES;

0° ± 0.1°C, 25° ± 0.1°C, AND 50° ± 0.1°C. THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT. A CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF PARA. 4A AND 4B ABOVE SHALL ALSO BE SUPPLIED WITH EACH LOT SHIPPED.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
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CONTRACT
DRAWN Ray Wheeler DATE 8 Aug 63
CHECKED J. Ruggeri / A. Mayo 19 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL 10 Sept 63

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RESISTOR,
TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006712
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 03038

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03036	10/4/63	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK
Ⓜ C.	REVISED PER TDRR 12767	4/21/65	WK

TABLE I

DASH NO.	NOMINAL ZERO-POWER RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC TC/°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C MIN	TIME CONSTANT SECONDS MIN	DIMENSIONS A	B	C	D NOM
-1	500	CURVE D	2.25	5.25	.19 .11	.19 .11	.021 .019	.10
-2	1000	CURVE D	1.95	3.75	.13 .07	.13 .07	.021 .019	.10
-3	5000	CURVE F	3.225	8.95	.28 .18	.28 .18	.021 .019	.20

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$

TEMP °C	CURVE "D" β =3900±55		CURVE "F" β =4320±80
-60	145.2		330.3
-50	68.8		131.6
-40	34.28		56.82
-30	17.92		26.31
-20	9.792		13.20
-10	5.560		6.880
0	3.274		3.93
+10	1.992		2.159
+20	1.250		1.275
+25	1.000		1.000
+30	.8053		.7890
+40	.5316		.5000
+50	.3595		.3260
+60	.2482		.2190
+70	.1747		.1500
+80	.1252		.1050
+90	.0912		.0753
+100	.0675		.0545
+110	.0507		.0407

TABLE III

EXAMINATION OR TEST	REQUIREMENT PARAGRAPHS
GENERAL QUALIFICATION REQUIREMENTS	PARA. 3.2 THROUGH 3.9.2 OF ND - 1002057
GROUP I (ALL SAMPLES)	
VISUAL & MECHANICAL	PARA 4.2.1 OF ND -1002057
ZERO-POWER RESISTANCE	PARA 4.5.2 OF MIL-T-23648 EXCEPT MEASURE AT +25 & +50°C
DISSIPATION CONSTANT	PARA 4.5.4 OF MIL-T-23648
THERMAL TIME CONSTANT	PARA 4.5.5 OF MIL-T-23648
MAXIMUM POWER RATING	PARA 3.1.7 OF MIL-T-23648 EXCEPT MEASURE POWER THAT PRODUCES TEMPERATURE RISE OF +80°C
GROUP II (1/3 OF SAMPLES)	
RESISTANCE - TEMPERATURE CHARACTERISTICS	PARA 4.5.11 OF MIL-T-23648 EXCEPT SEQUENCE 7 WILL BE 105°C AND SEQUENCE 8 WILL NOT BE USED.
TEMPERATURE CYCLING	PARA 4.5.8 OF MIL-T-23648 (EXCEPT USE TEST CONDITION A OF MIL-STD-202)
THERMAL STABILITY	PARA 4.5.6 OF MIL-T-23648 EXCEPT TEMPERATURE IN PARA 4.5.6.2 WILL BE +105 ± 2°C
LOW TEMPERATURE STORAGE	PARA 4.5.7 OF MIL-T-23648 EXCEPT LOW TEMPERATURE WILL BE -55 ± 3°C
TERMINAL STRENGTH	PARA 4.5.10 OF MIL-T-23648
GROUP III (1/3 OF SAMPLES)	
VIBRATION	PARA 4.2.11 OF ND 1002057 (SEE NOTE 1)
SHOCK	PARA 4.2.12 OF ND 1002057 (SEE NOTE 1)
MOISTURE RESISTANCE	PARA 4.5.13 OF MIL-T-23648 (SEE NOTE 2)
GROUP IV (1/3 OF SAMPLES)	
LOAD LIFE	PARA 4.5.15 OF MIL-T-23648 EXCEPT INITIAL RESISTANCE MAY BE MEASURED PRIOR TO START OF LIFE. MAX OPERATING TEMPERATURE IS +105°C
LEAD COMPOSITION	PARA 4.2.16 OF ND 1002057

NOTE 1

THE AMOUNT OF POWER TO BE APPLIED WILL BE THAT NECESSARY TO RAISE THE THERMISTOR TEMPERATURE TO APPROX. +65°C UNDER NORMAL FREE AIR CONDITIONS. ZERO-POWER RESISTANCE WILL BE MEASURED BEFORE AND AFTER TEST PER PARA. 4.5.2. OF MIL-T-23648.

NOTE 2

INDICATED STEPS (a), (d), AND (f) REPLACED BY (1), (4), AND (7) RESPECTIVELY.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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CHECKED S. Ruggeri / H. Maynard 12 aug 63
APPROVAL A.Y. G. MAYO 9/4/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/11/63
MIT APPROVAL W Kupfer 10/4/63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006712
SCALE NONE WT SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D	1006712

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10/9/63	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK
C	REVISED PER TDRR 12767	4/21/65	WK
D	REVISED PER TDRR 19731	6/15/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS LISTED IN TABLE III WITH REFERENCES TO MIL-T-23648 AND ND 1002057. ANY UNIT WILL BE CONSIDERED A FAILURE IF ITS ZERO-POWER RESISTANCE CHANGES BY MORE THAN 0.5% AS A RESULT OF HAVING BEEN SUBJECTED TO ANY OF THE ENVIRONMENTAL TESTS SPECIFIED. [illegible]
   - D. MARKING: UNIT PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) MATERIAL AND FINISH CERTIFICATION: LEAD MATERIAL AND RESISTOR MOISTURE PROOF VARNISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) ZERO-POWER RESISTANCE VALUE: TABLE I VALUE ± 1%.

[illegible] TS ARE BASED [illegible] TAKEN AT [illegible]

3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TO REACH 63% OF THE TEMPERATURE CHANGE FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

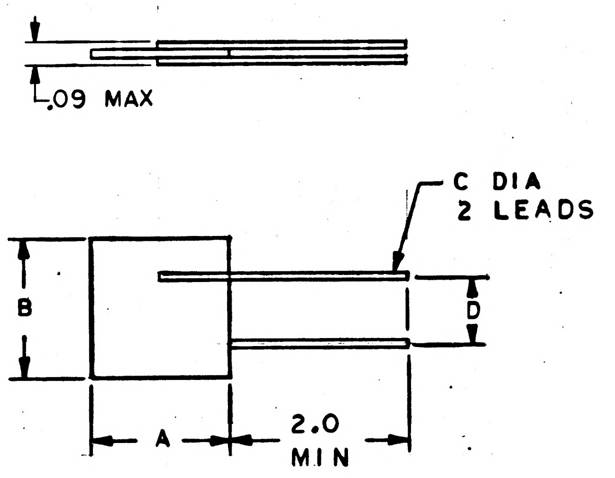
SPECIAL CONDITIONING (CONT'D)

   - C. FOLLOWING BURN-IN. THE ZERO-POWER RESISTANCE OF EACH UNIT SHALL BE MEASURED AT THREE(3) TEMPERATURES;

     0° ± 0.1°C, 25° ± 0.1°C, AND 50° ± 0.1°C.

     THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT. A CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF PARA. 4A AND 4B ABOVE SHALL ALSO BE SUPPLIED WITH EACH LOT SHIPPED.

5. VENDOR SUPPLIED INFORMATION:
   - A. THE FOLLOWING DATA AND INFORMATION TO BE SUPPLIED WITH EACH SHIPMENT UNLESS OTHERWISE SPECIFIED. ALL DATA SUPPLIED WILL REFERENCE THE UNIT PART NUMBER, APPLICABLE DASH NUMBER, AND APPLICABLE PURCHASE ORDER NUMBER.
     - (1) A CERTIFICATE OF COMPLIANCE COVERING REQUIREMENTS OF PARA 2.A(3) AND 4.C. OF THIS SPECIFICATION AND PARA 3.3.3 OF ND1015404.
     - (2) TEST DATA AS REQUIRED BY PARA 4.3 OF THIS SPECIFICATION.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sep 63
NASA APPROVAL [illegible] 9/10/63
MIT APPROVAL W Kupfer 10 Sep 63

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RESISTOR,
TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

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SIZE C
NASA DRAWING NO. 1006712
SCALE NONE
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SHEET 1 OF 2

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REVISIONS 03038

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03058	10/4/63	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK
C	REVISED PER TDRR 12767	4/21/65	WK
D	REVISED PER TDRR 19731	6/15/65	WK

TABLE I

DASH NO.	ZERO-POWER RESISTANCE IN OHMS			DISSIPATION CONSTANT MW/°C MIN	TIME CONSTANT SECONDS MIN	DIMENSIONS			
	+25±0.1°C	0±0.1°C	+50±0.1°C			A	B	C	D NOM
-1	500±1%	1,635±3%	179.7±3%	2.25	5.25	.19 .11	.19 .11	.021 .019	.10
-2	1,000±1%	3,274±3%	359.5±3%	1.95	3.75	.13 .07	.13 .07	.021 .019	.10
-3	5,000±1%	17,700±3%	1,630±3%	3.225	3.95	.28 .18	.28 .18	.021 .019	.20

3.93

TABLE II

EXAMINATION OR TEST	REQUIREMENT PARAGRAPHS
GENERAL QUALIFICATION REQUIREMENTS	PARA. 3.2 THROUGH 3.9.2 OF ND - 1002057
GROUP I (ALL SAMPLES)	
VISUAL & MECHANICAL	PARA 4.2.1 OF ND -1002057
ZERO-POWER RESISTANCE	PARA 4.5.2 OF MIL-T-23648 EXCEPT MEASURE AT 25°C, +50°C & 0°C
DISSIPATION CONSTANT	PARA 4.5.4 OF MIL-T-23648
THERMAL TIME CONSTANT	PARA 4.5.5 OF MIL-T-23648
MAXIMUM POWER RATING	PARA 3.3.7 OF MIL-T-23648 EXCEPT MEASURE POWER THAT PRODUCES TEMPERATURE RISE OF +80°C
GROUP II (1/3 OF SAMPLES)	
CHARACTERISTICS	
TEMPERATURE CYCLING	PARA 4.5.8 OF MIL-T-23648 (EXCEPT USE TEST CONDITION A OF MIL-STD-202)
THERMAL STABILITY	PARA 4.5.6 OF MIL-T-23648 EXCEPT TEMPERATURE IN PARA 4.5.6.2 WILL BE +105 ± 2°C
LOW TEMPERATURE STORAGE	PARA 4.5.7 OF MIL-T-23648 EXCEPT LOW TEMPERATURE WILL BE -55 ± 3°C
TERMINAL STRENGTH	PARA 4.5.10 OF MIL-T-23648
GROUP III (1/3 OF SAMPLES)	
VIBRATION	PARA 4.2.11 OF ND 1002057 (SEE NOTE 1)
SHOCK	PARA 4.2.12 OF ND 1002057 (SEE NOTE 1)
MOISTURE RESISTANCE	PARA 4.5.13 OF MIL-T-23648 (SEE NOTE 2)
GROUP IV (1/3 OF SAMPLES)	
LOAD LIFE	PARA 4.5.15 OF MIL-T-23648 EXCEPT INITIAL RESISTANCE MAY BE MEASURED PRIOR TO START OF LIFE. MAX OPERATING TEMPERATURE IS +105°C
LEAD COMPOSITION	PARA 4.2.16 OF ND 1002057

NOTE 1

THE AMOUNT OF POWER TO BE APPLIED WILL BE THAT NECESSARY TO RAISE THE THERMISTOR TEMPERATURE TO APPROX. +65°C UNDER NORMAL FREE AIR CONDITIONS. ZERO-POWER RESISTANCE WILL BE MEASURED BEFORE AND AFTER TEST PER PARA. 4.5.2. OF MIL-T-23648.

NOTE 2

INDICATED STEPS (a), (d), AND (f) REPLACED BY (1), (4), AND (7) RESPECTIVELY.

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MIT APPROVAL 10 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR,
TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006712
SCALE NONE
WT
SHEET 2 OF 2

MASTER

1006712 E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
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A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK
C	REVISED PER TDRR 12767	4/21/65	WK
D	REVISED PER TDRR 19731	8/15/65	WK
E	REVISED PER TDRR 24692	12/21/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS LISTED IN TABLE III WITH REFERENCES TO MIL-T-23648 AND ND 1002057. ANY UNIT WILL BE CONSIDERED A FAILURE IF ITS ZERO-POWER RESISTANCE CHANGES BY MORE THAN 1.0% AS A RESULT OF HAVING BEEN SUBJECTED TO ANY OF THE ENVIRONMENTAL TESTS SPECIFIED. [illegible]
   - D. MARKING: UNIT PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) MATERIAL AND FINISH CERTIFICATION: LEAD MATERIAL AND RESISTOR MOISTURE PROOF VARNISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) ZERO-POWER RESISTANCE VALUE: TABLE I VALUE ± 1%.

3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TO REACH 63% OF THE TEMPERATURE CHANGE FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

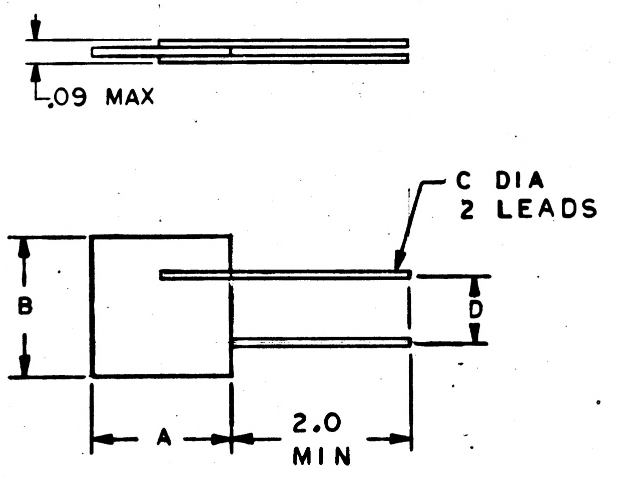
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SPECIAL CONDITIONING (CONT'D)

- C. FOLLOWING BURN-IN. THE ZERO-POWER RESISTANCE OF EACH UNIT SHALL BE MEASURED AT THREE(3) TEMPERATURES;

  0° ± 0.1°C, 25° ± 0.1°C, AND 50° ± 0.1°C. THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT. A CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF PARA. 4A AND 4B ABOVE SHALL ALSO BE SUPPLIED WITH EACH LOT SHIPPED.

5. VENDOR SUPPLIED INFORMATION:
   - A. THE FOLLOWING DATA AND INFORMATION TO BE SUPPLIED WITH EACH SHIPMENT UNLESS OTHERWISE SPECIFIED. ALL DATA SUPPLIED WILL REFERENCE THE UNIT PART NUMBER, APPLICABLE DASH NUMBER, AND APPLICABLE PURCHASE ORDER NUMBER.
     - (1) A CERTIFICATE OF COMPLIANCE COVERING REQUIREMENTS OF PARA 2.A(3) AND 4.C. OF THIS SPECIFICATION AND PARA 3.3.3 OF ND1015404.
     - (2) TEST DATA AS REQUIRED BY PARA 4.C OF THIS SPECIFICATION.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
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MATERIAL: SEE NOTES
HEAT TREATMENT
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CONTRACT

DRAWN Ray Wheeler DATE 8 Aug 63
CHECKED J. Ruggiero / H. Mayer 19 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL W Kupfer 10 Sep 63

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HOUSTON, TEXAS

RESISTOR,
TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006712
SCALE NONE	WT	SHEET 1 OF 2

MASTER

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REVISIONS 03038

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10/1963	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK
C	REVISED PER TDRR 12767	4/21/65	WK
D	REVISED PER TDRR 19731	6/15/65	WK
E	REVISED PER TDRR 24692	12/14/65	WK

TABLE I

DASH NO.	ZERO-POWER RESISTANCE IN OHMS			DISSIPATION CONSTANT MW/°C MIN	TIME CONSTANT SECONDS MIN	DIMENSIONS			
	+25±0.1°C	0±0.1°C	+50±0.1°C			A	B	C	D NOM
-1	500±1%	1,635±3%	179.7±3%	2.25	5.25	.19 .11	.19 .11	.021 .019	.10
-2	1,000±1%	3,274±3%	359.5±3%	1.95	3.75	.13 .07	.13 .07	.021 .019	.10
-3	5,000±1%	17,700±3%	1,630±3%	3.225	3.95	.28 .18	.28 .18	.021 .019	.20

3.95

TABLE II

EXAMINATION OR TEST	REQUIREMENT PARAGRAPHS
GENERAL QUALIFICATION REQUIREMENTS	PARA. 3.2 THROUGH 3.9.2 OF ND - 1002057
GROUP I (ALL SAMPLES)	
VISUAL & MECHANICAL	PARA 4.2.1 OF ND -1002057
ZERO-POWER RESISTANCE	PARA 4.5.2 OF MIL-T-23648 EXCEPT MEASURE AT 25°C, +50°C & 0°C
DISSIPATION CONSTANT	PARA 4.5.4 OF MIL-T-23648
THERMAL TIME CONSTANT	PARA 4.5.5 OF MIL-T-23648
MAXIMUM POWER RATING	PARA 3.3.7 OF MIL-T-23648 EXCEPT MEASURE POWER THAT PRODUCES TEMPERATURE RISE OF +80°C
GROUP II (1/3 OF SAMPLES)	
CHARACTERISTICS	
TEMPERATURE CYCLING	PARA 4.5.8 OF MIL-T-23648 (EXCEPT USE TEST CONDITION A OF MIL-STD-202)
THERMAL STABILITY	PARA 4.5.6 OF MIL-T-23648 EXCEPT TEMPERATURE IN PARA 4.5.6.2 WILL BE +105 ± 2°C
LOW TEMPERATURE STORAGE	PARA 4.5.7 OF MIL-T-23648 EXCEPT LOW TEMPERATURE WILL BE -55 ± 3°C
TERMINAL STRENGTH	PARA 4.5.10 OF MIL-T-23648
GROUP III (1/3 OF SAMPLES)	
VIBRATION	PARA 4.2.11 OF ND 1002057 (SEE NOTE 1)
SHOCK	PARA 4.2.12 OF ND 1002057 (SEE NOTE 1)
MOISTURE RESISTANCE	PARA 4.5.13 OF MIL-T-23648 (SEE NOTE 2)
GROUP IV (1/3 OF SAMPLES)	
LOAD LIFE	PARA 4.5.15 OF MIL-T-23648 EXCEPT INITIAL RESISTANCE MAY BE MEASURED PRIOR TO START OF LIFE. MAX OPERATING TEMPERATURE IS +105°C
LEAD COMPOSITION	PARA 4.2.16 OF ND 1002057

NOTE 1

THE AMOUNT OF POWER TO BE APPLIED WILL BE THAT NECESSARY TO RAISE THE THERMISTOR TEMPERATURE TO APPROX. +65°C UNDER NORMAL FREE AIR CONDITIONS. ZERO-POWER RESISTANCE WILL BE MEASURED BEFORE AND AFTER TEST PER PARA. 4.5.2. OF MIL-T-23648.

NOTE 2

INDICATED STEPS (a), (d), AND (f) REPLACED BY (1), (4), AND (7) RESPECTIVELY.

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LIST OF MATERIALS

NEXT ASSY	USED ON
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TOLERANCES ON
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DRAWN DATE 15 aug 63
CHECKED 12 aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/11/63
MIT APPROVAL 10/63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006712
SCALE NONE
WT
SHEET 2 OF 2

MASTER

1006712

REVISIONS			03038
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10/4/63	wll

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NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.

   D. MARKING: UNIT PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)

   A. MECHANICAL REQUIREMENTS:
      (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
      (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
      (3) MATERIAL AND FINISH CERTIFICATION: LEAD MATERIAL AND RESISTOR MOISTURE PROOF VARNISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.

   B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
      (1) RESISTANCE VALUE: TABLE I VALUE ± 1%.
      (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K}=R_{298°K}e^{\beta\left(\frac{1}{T}-\frac{1}{298}\right)}$
      SEE TABLE II FOR β AND TABULATED VALUES OF R_T.

3. DESIGN REQUIREMENTS:

   A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.

   B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TO REACH 63% OF THE TEMPERATURE CHANGE FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.

   C.

   C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.

   D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.

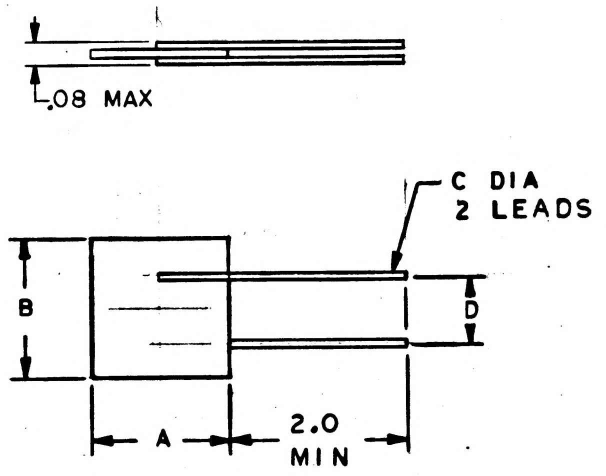
   E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.

4. SPECIAL CONDITIONING:

   A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

   B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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FRACTIONS ± DECIMALS ± ANGLES ±
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DRAWN Ray Wheeler DATE 8 Aug 63
CHECKED J. Ruggin 19 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL [illegible] 9 Sep 63
NASA APPROVAL [illegible] 9/10/63
MIT APPROVAL W Kupfer 10/4/63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006712
SCALE NONE	WT	SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006712

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03058	10 Sep 63	WK

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TABLE I

DASH NO.	NOMINAL RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC TC/°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C	TIME CONSTANT SECONDS	DIMENSIONS A	DIMENSIONS B	DIMENSIONS C	DIMENSIONS D NOM
-1	500	CURVE D	3.0 ± 10%	7 ± 20%	.19 .11	.19 .11	.011 .009	.10
-2	1000	CURVE D	2.6 ± 10%	5 ± 20%	.13 .07	.13 .07	.011 .009	.10
-3	5000	CURVE F	4.3 ± 10%	12 ± 20%	.28 .18	.28 .18	.011 .009	.20

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$

TEMP °C	CURVE "D" β =3900±55	CURVE "E" β =3400±80	CURVE "F" β =4320±80
-60	145.2	73.04	330.3
-50	68.8	38.95	131.6
-40	34.28	21.51	56.82
-30	17.92	12.33	26.31
-20	9.792	7.307	13.20
-10	5.560	4.476	6.880
0	3.274	2.825	3.830
+10	1.992	1.830	2.159
+20	1.250	1.216	1.275
+25	1.000	1.000	1.000
+30	.8053	.8267	.7890
+40	.5316	.5742	.5000
+50	.3595	.4067	.3260
+60	.2482	.2937	.2190
+70	.1747	.2160	.1500
+80	.1252	.1615	.1050
+90	.0912	.1229	.0753
+100	.0675	.0946	.0545
+110	.0507	.0739	.0407
+120	.0386	.0584	.0298
+130	.0298	.0470	.0232
+140	.0232	.0382	.0176
+150	.0184	.0313	.0137

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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NASA APPROVAL 9/4/63
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CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006712
SCALE NONE
WT
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A	1006714

REVISIONS			02821
SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ A	REVISED PER TDRR 19734	6/15/65	WK.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE IN ACCORDANCE WITH MIL-R-93/20 (TYPE RB71) AS SPECIFIED BELOW WITH EXCEPTIONS.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF METTING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019 WITH THE RESISTANCE VALUE, WATTAGE AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE OR DATE CODE AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: NICKEL PER ND PS 1015400. MATERIAL CERTIFICATION SHALL ACCOMPANY EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25 ± 0.1°C UNLESS OTHERWISE SPECIFIED):
     - (1) RESISTANCE VALUE: 4000 OHMS.
     - (2) RESISTANCE TOLERANCE: ± 1%
     - (3) RESISTANCE-TEMPERATURE CHARACTERISTIC (FROM +25° TO +105°C): +4300 ± 300 PPM/°C.

3. DESIGN REQUIREMENTS:
   - A. RATINGS:
     - (1) MAXIMUM WORKING VOLTAGE: 100 VOLTS.
     - (2) POWER DISSIPATION: .25 WATTS AT +105°C DERATED LINEARLY TO .10 WATTS AT +125°C. (SEE FIGURE 1.)
     - (3) RESISTANCE VALUE STABILITY (LONG RANGE): 30 PARTS PER MILLION FOR ONE YEAR AND 50 PARTS PER MILLION FOR A 3 YEAR PERIOD.

DESIGN REQUIREMENTS:

   - B. OPERATING LIFE: 2000 HOURS MINIMUM AT FULL RATED WATTAGE.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE WITHOUT ELECTRICAL CHANGE.
   - D. CONSTRUCTION: ENCAPSULATED, WIREWOUND RESISTANCE ELEMENT.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93, PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAGRAPH 2.B.2 OF THIS SPECIFICATION AFTER TEST SHALL BE REJECTED.
   - B. BURN IN: ALL RESISTORS SHALL BE SUBJECTED TO A 24 HOUR FULL POWER BURN IN AT 105°C AMBIENT TEMPERATURE. THE CHANGE IN RESISTANCE SHALL NOT EXCEED 0.2%. DO NOT SHIP ANY PARTS WHICH ARE BEYOND PURCHASE TOLERANCE AT CONCLUSION OF TEST.
   - B. 100 HOUR SHORT TERM STABILITY REQUIREMENTS:

     EACH RESISTOR SHALL BE ENERGIZED AT FULL RATED POWER (40%) AT 125°C $^{+0°}_{-5°C}$ FOR A PERIOD OF 100 $^{+2}_{-0}$ HOURS.

     POWER SHALL BE APPLIED FOR AT LEAST 98 HOURS WITH ONE TURN OFF PERIOD OF AT LEAST ONE(1) HOUR NEAR THE FIFTY(50) HOUR INTERVAL. MEASUREMENTS SHOULD BE TAKEN AND DATA RECORDED BEFORE AND AFTER TEST. THESE MEASUREMENTS ARE TO BE TAKEN WITHIN ONE(1) HOUR BEFORE START AND AFTER TEST. MEASUREMENT TEMPERATURES SHALL BE WITHIN ONE(1) DEGREE CENTIGRADE OF EACH OTHER.AND CORRECTED TO 0.2°C.

     TOTAL RESISTANCE CHANGE AS A RESULT OF THE STABILITY TEST SHOULD NOT EXCEED 400 PPM.
   - C. EACH RESISTOR SHALL BE SERIALIZED AND RESISTANCE MEASUREMENTS TAKEN AND SUPPLIED WITH SHIPMENT AT 0°C ± 0.1°C, 25°C ± 0.1°C, 50°C ± 0.1°C AND 70°C ± 0.1°C.

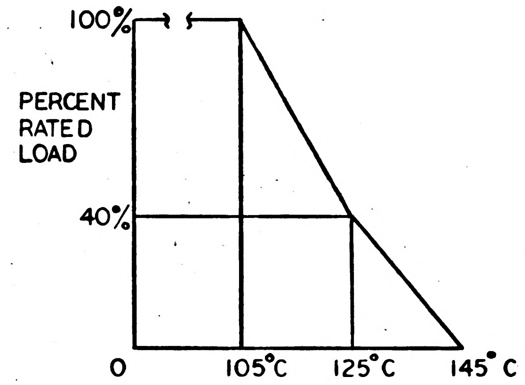
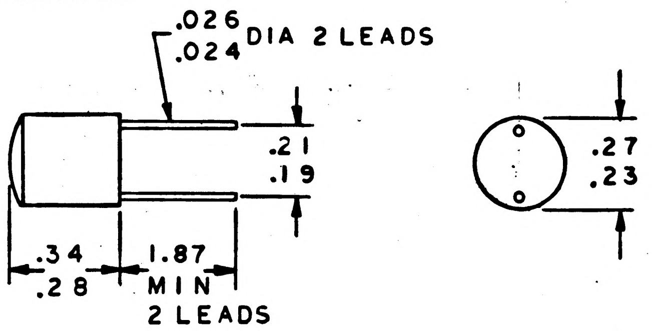


FIG 1 - POWER DERATING



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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DRAWN M C. Crespi DATE 22 July 63 CHECKED J. Russo / H. Maynard 8/19/63 APPROVAL E. Driscoll 23 Aug '63 APPROVAL Eldon C Hall 23 Aug 63	RESISTOR, FIXED, WIREWOUND POSITIVE TEMP COEF SPECIFICATION CONTROL DRAWING
NASA APPROVAL Jack Barnard MIT APPROVAL D Nafzel 8/28/63	CODE IDENT NO. 80230 · SIZE C · NASA DRAWING NO. 1006714 SCALE NONE · WT · SHEET 1 OF 1

1006714

SYM	DESCRIPTION	DATE	APPROVAL

REVISIONS 02821

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE IN ACCORDANCE WITH MIL-R-93/20 (TYPE RB71) AS SPECIFIED BELOW WITH EXCEPTIONS.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF METTING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE RESISTANCE VALUE, WATTAGE AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE OR DATE CODE AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: NICKEL PER ND PS 1015400. MATERIAL CERTIFICATION SHALL ACCOMPANY EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25 ± 0.1°C UNLESS OTHERWISE SPECIFIED):
     - (1) RESISTANCE VALUE: 4000 OHMS.
     - (2) RESISTANCE TOLERANCE: ± 1%
     - (3) RESISTANCE-TEMPERATURE CHARACTERISTIC (FROM +25° TO +105°C): +4300 ± 300 PPM/°C.

3. DESIGN REQUIREMENTS:
   - A. RATINGS:
     - (1) MAXIMUM WORKING VOLTAGE: 100 VOLTS.
     - (2) POWER DISSIPATION: .25 WATTS AT +105°C DERATED LINEARLY TO .10 WATTS AT +125°C. (SEE FIGURE 1.)
     - (3) RESISTANCE VALUE STABILITY (LONG RANGE): 30 PARTS PER MILLION FOR ONE YEAR AND 50 PARTS PER MILLION FOR A 3 YEAR PERIOD.
   - B. OPERATING LIFE: 2000 HOURS MINIMUM AT FULL RATED WATTAGE.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE WITHOUT ELECTRICAL CHANGE.
   - D. CONSTRUCTION: ENCAPSULATED, WIREWOUND RESISTANCE ELEMENT.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93, PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAGRAPH 2.B.2 OF THIS SPECIFICATION AFTER TEST SHALL BE REJECTED.
   - B. BURN IN: ALL RESISTORS SHALL BE SUBJECTED TO A 24 HOUR FULL POWER BURN IN AT 105°C AMBIENT TEMPERATURE. THE CHANGE IN RESISTANCE SHALL NOT EXCEED 0.2%. DO NOT SHIP ANY PARTS WHICH ARE BEYOND PURCHASE TOLERANCE AT CONCLUSION OF TEST.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

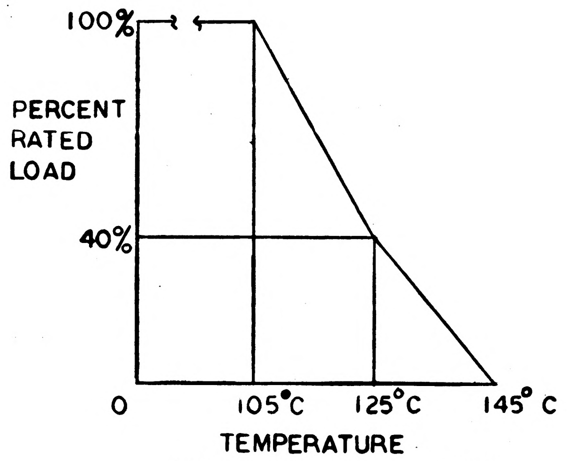
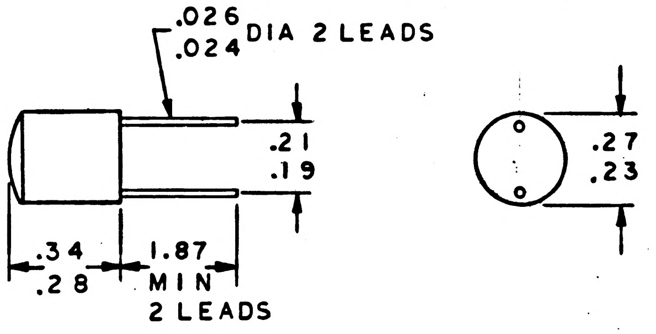


FIG. 1–POWER DERATING



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPROVAL Eldon C Hall 23 Aug 63
NASA APPROVAL Jack Barnard
MIT APPROVAL D Hoag 8/28/63

MANNED SPACECRAFT CENTER
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RESISTOR, FIXED, WIREWOUND
POSITIVE TEMP COEF
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006714
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
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1006714

A | 1006715

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	12 Sep 63	WK
A	REVISED PER TDRR 04399		PK WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

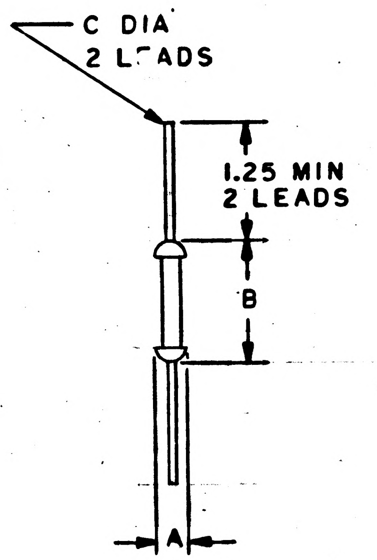
1. GENERAL REQUIREMENTS:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
    - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
    - D. MARKING: UNIT PACKAGES SHALL BE LEGIBLY MARKED PER MIL-STD-129, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER), MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, AND DATE OF MANUFACTURE.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
    - A. MECHANICAL REQUIREMENTS:
        - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
        - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
        - (3) CERTIFICATE OF COMPLIANCE: COMPLIANCE WITH THE LEAD AND VARNISH MATERIAL REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.

          EACH SHIPMENT.
    - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
        - (1) RESISTANCE VALUE: TABLE I VALUE.
        - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K}=R_{298°K}\,e^{\beta\left(\frac{1}{T}-\frac{1}{298}\right)}$

          SEE TABLE II FOR β AND TABULATED VALUES OF R_T.
3. DESIGN REQUIREMENTS:
    - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
    - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TEMPERATURE TO CHANGE 63% INTERNALLY FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
    - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
    - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
    - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.
    - G. LEAD MATERIAL: UNCOATED, WELDABLE NICKEL (GRADE
    - H. FINISH:
4. SPECIAL CONDITIONING:
    - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
    - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER



A	A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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CHECKED J. Ruggeri 28 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL W Kupfer 10 Sep 63

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RESISTOR, TEMPERATURE VARIABLE, NEGATIVE COEF

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006715
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1006715

INCHES
0 1 2
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1006715 A

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	WK
A	REVISED PER TDRR 04399		RPK WK.

TABLE I

DASH NO.	NOMINAL RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC AT 25°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C	TIME CONSTANT SECONDS	DIMENSIONS		
					A MAX	B MAX	C
-1	100K ± 1%	CURVE D	± 10% 2.3 MIN	20% 12 MIN	.120	.625	.017 .015
-2	10K ± 10%	CURVE B	2.3 MIN	12 MIN	.120	.625	.017 .015

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$		
TEMP °C	CURVE "D" $\beta = 3900 \pm 55$	CURVE "B" $\beta = 3450 \pm 80K$
-60	145.2	77.0
-50	68.9	40.2
-40	34.3	22.0
-30	17.9	12.5
-20	9.79	7.42
-10	5.56	4.54
0	3.27	2.85
+10	1.99	1.84
+20	1.25	1.22
+25	1.000	1.000
+30	.805	.825
+40	.532	.570
+50	.360	.402
+60	.248	.289
+70	.175	.212
+80	.125	.157
+90	.091	.119
+100	.0675	.0910
+110	.0508	.0705
+120	.0387	.0552
+130	.0299	.0437
+140	.0233	.0350
+150	.0184	.0285

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APPROVAL G. MAYO 9/4/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/1/63
MIT APPROVAL W Kupfer 10 Sep 63

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SPECIFICATION CONTROL DRAWING

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SIZE C
NASA DRAWING NO. 1006715
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
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B	1006715

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	WK
A	REVISED PER TDRR 04399		EPK WK
B	REVISED PER TDRR 06436	25 Feb 64	EPK WK

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2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) CERTIFICATE OF COMPLIANCE: COMPLIANCE WITH THE LEAD AND VARNISH MATERIAL REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.

       [illegible] WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) RESISTANCE VALUE: TABLE I VALUE.
     - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K} = R_{298°K}\, e^{\beta\left(\frac{1}{T} - \frac{1}{298}\right)}$ SEE TABLE II FOR β AND TABULATED VALUES OF R_T.

3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TEMPERATURE TO CHANGE 63% INTERNALLY FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
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   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.
   - G. LEAD MATERIAL: UNCOATED, WELDABLE NICKEL (GRADE [illegible]
   - H. FINISH: [illegible]

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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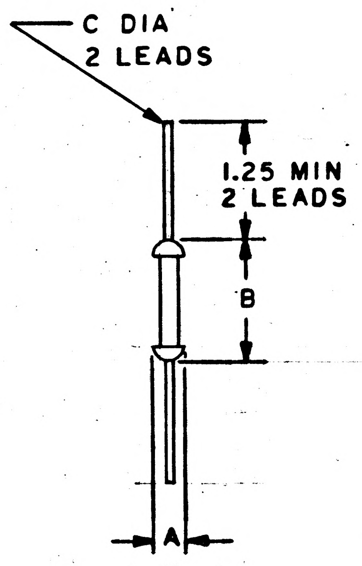
SPECIAL CONDITIONING (CONT'D)

C. FOLLOWING BURN-IN THE RESISTANCE OF EACH UNIT SHALL BE MEASURED AT (3) THREE TEMPERATURES; 0°±0.1°C, 25°±0.1°C AND 50±0.1°C. THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT.



B	A
A	A
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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MIT APPROVAL W Kupfer 10 Sep 63

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HOUSTON, TEXAS

RESISTOR, TEMPERATURE VARIABLE, NEGATIVE COEF

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006715

SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
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C	1006715

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS 03038		
-	INITIAL RELEASE CLASS A PER TDRR 03038	12 Sep 63	WK
A	REVISED PER TDRR 04399		EDK WK
B	REVISED PER TDRR 06436	25 Feb 64	EDK WK
C	REVISED PER TDRR 08861	6/2/64	WK

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NOTES:

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   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS LISTED IN TABLE III WITH REFERENCES TO MIL-T-23648 AND ND 1002057. ANY UNIT WILL BE CONSIDERED A FAILURE IF ITS ZERO-POWER RESISTANCE CHANGES ~~UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIRE~~ BY MORE THAN 0.5% AS A RESULT OF HAVING BEEN SUBJECTED TO ANY OF THE ENVIRONMENTAL TESTS SPECIFIED.
   - D. MARKING: UNIT PACKAGES SHALL BE LEGIBLY MARKED PER MIL-STD-129, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER), MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, AND DATE OF MANUFACTURE AND SERIAL NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) CERTIFICATE OF COMPLIANCE: COMPLIANCE WITH THE LEAD AND VARNISH MATERIAL REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.

       EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) ZERO-POWER RESISTANCE VALUE: TABLE I VALUE.
     - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K} = R_{298°K} e^{\beta\left(\frac{1}{T} - \frac{1}{298}\right)}$

       SEE TABLE II FOR β AND TABULATED VALUES OF R_T.

       BETA VALUES ARE BASED ON READINGS TAKEN AT +25° & 50°C.
3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TEMPERATURE TO CHANGE 63% INTERNALLY FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.
   - G. LEAD MATERIAL: UNCOATED, WELDABLE NICKEL (GRADE
   - H. FINISH: [illegible]
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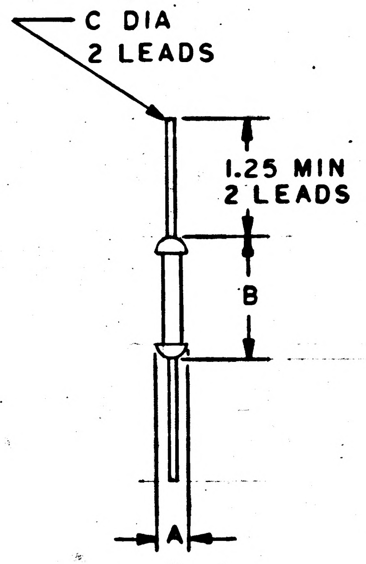
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

SPECIAL CONDITIONING(CONT'D)

C. FOLLOWING BURN-IN THE ZERO-POWER RESISTANCE OF EACH UNIT SHALL BE MEASURED AT (3) THREE TEMPERATURES; 0°±0.1°C, 25°±0.1°C AND 50±0.1°C. THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT. A CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF PARA 4A AND 4B ABOVE SHALL ALSO BE SUPPLIED WITH EACH LOT SHIPPED.



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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
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DO NOT SCALE THIS DRAWING
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CHECKED J. Ruggeri H. Maynard 28 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006715

SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
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REVISIONS 03038

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	WK
A	REVISED PER TDRR 04399		RPK WK.
C	REVISED PER TDRR 08861	6/2/64	WK

TABLE I

DASH NO.	NOMINAL ZERO-POWER RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC AT 25°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C	TIME CONSTANT SECONDS	DIMENSIONS A MAX	DIMENSIONS B MAX	DIMENSIONS C
-1	100K ± 1%	CURVE D	± 10% 2.3 MIN	± 10% 12 MIN	.120	.625	.017 .015
-2	10K ± 10%	CURVE B	2.3 MIN	12 MIN	.120	.625	.017 .015

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$

TEMP °C	CURVE "D" β = 3900±55	CURVE "B" β = 3450 ±80
-60	145.2	77.0
-50	68.9	40.2
-40	34.3	22.0
-30	17.9	12.5
-20	9.79	7.42
-10	5.56	4.54
0	3.27	2.85
+10	1.99	1.84
+20	1.25	1.22
+25	1.000	1.000
+30	.805	.825
+40	.532	.570
+50	.360	.402
+60	.248	.289
+70	.175	.212
+80	.125	.157
+90	.091	.119
+100	.0675	.0910
+110	.0508	.0705

TABLE III

EXAMINATION OR TEST	REQUIREMENT PARAGRAPHS
GENERAL QUALIFICATION REQUIREMENTS	PARAGRAPHS 3.2 THROUGH 3.9.2 OF ND -1002057
GROUP I (ALL SAMPLES)	
VISUAL & MECHANICAL	PARA 4.2.1 OF ND 1002057
ZERO-POWER RESISTANCE	PARA 4.5.2 OF MIL-T-23648 EXCEPT MEASURE AT +25 & 50°C
DISSIPATION CONSTANT	PARA 4.5.4 OF MIL-T-23648
THERMAL TIME CONSTANT	PARA 4.5.5 OF MIL-T-23648
MAXIMUM POWER RATING	PARA 3.3.7 OF MIL-T-23648 EXCEPT MEASURE POWER THAT PRODUCES TEMP. RISE OF +80°C
GROUP II (1/3 OF SAMPLES)	
RESISTANCE - TEMPERATURE CHARACTERISTICS	PARA 4.5.11 OF MIL-T-23648 EXCEPT SEQUENCE 7 WILL BE 105°C & SEQUENCE 8 WILL NOT BE USED
TEMPERATURE CYCLING	PARA 4.5.8 OF MIL-T-23648
THERMAL STABILITY	PARA 4.5.6 OF MIL-T-23648 EXCEPT TEMPERATURE IN PARA 4.5.6.2 WILL BE +105 ± 2°C
LOW TEMPERATURE STORAGE	PARA 4.5.7 OF MIL-T-23648 EXCEPT LOW TEMP WILL BE -55 ± 3°C
TERMINAL STRENGTH	PARA 4.5.10 OF MIL-T-23648
GROUP III (1/3 OF SAMPLES)	
VIBRATION	PARA 4.2.11 OF ND 1002057 (SEE NOTE 1)
SHOCK	PARA 4.2.12 OF ND 1002057 (SEE NOTE 1)
MOISTURE RESISTANCE	PARA 4.5.13 OF MIL-T-23648(SEE NOTE 2)
GROUP IV (1/3 OF SAMPLES)	
LOAD LIFE	PARA 4.5.15 OF MIL-T-23648 EXCEPT INITIAL RESISTANCE MAY BE MEASURED PRIOR TO START OF LIFE. MAX OPERATING TEMP IS +105°C
LEAD COMPOSITION	PARA 4.2.16 OF ND 1002057

NOTE 1

THE AMOUNT OF POWER TO BE APPLIED WILL BE THAT NECESSARY TO RAISE THE THERMISTOR TEMP. TO APPROX. +65°C UNDER NORMAL FREE AIR CONDITIONS. ZERO POWER RESISTANCE WILL BE MEASURED BEFORE & AFTER TEST PER PARA 4.5.2 OF MIL-T-23648.

NOTE 2

INDICATED STEPS (a), (d), & (f) REPLACED BY (1), (4), & (7) RESPECTIVELY.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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DO NOT SCALE THIS DRAWING
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DRAWN Ray Wheeler DATE 20 Aug 63
CHECKED J Ruggeri 28 Aug 63 [illegible]
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL [illegible] 9/1/63
MIT APPROVAL [illegible] 10 Sep 63

MANNED SPACECRAFT CENTER
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RESISTOR, TEMPERATURE VARIABLE, NEGATIVE COEF
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006715
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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D 1006715

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS 03038			
-	INITIAL RELEASE CLASS A PER TDRR 03038	12 Sep 63	WK
A	REVISED PER TDRR 04399		EPK WK
B	REVISED PER TDRR 06436	26 Feb 64	EPK WK
C	REVISED PER TDRR 08861	6/2/64	WK
D	REVISED PER TDRR 13252	10/14	RTS

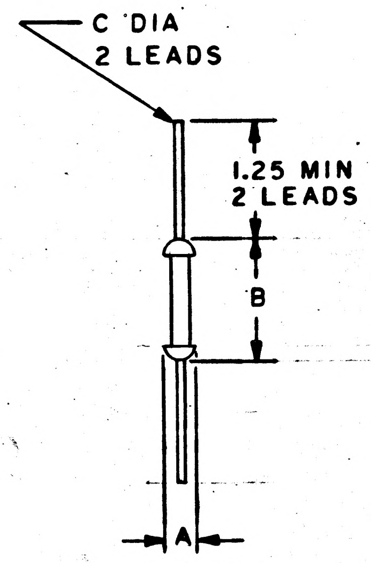
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS LISTED IN TABLE III WITH REFERENCES TO MIL-T-23648 AND ND 1002057. ANY UNIT WILL BE CONSIDERED A FAILURE IF ITS ZERO-POWER RESISTANCE CHANGES ~~UNITS SHALL BE CAPABLE OF MEETING THE QUALIFIC~~ BY MORE THAN 1.0% AS A RESULT OF HAVING BEEN SUBJECTED TO ANY OF THE ENVIRONMENTAL TESTS SPECIFIED.
   - D. MARKING: UNIT PACKAGES SHALL BE LEGIBLY MARKED PER MIL-STD-129, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER), MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, AND DATE OF MANUFACTURE AND SERIAL NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) CERTIFICATE OF COMPLIANCE: COMPLIANCE WITH THE LEAD AND VARNISH MATERIAL REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.

       EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) ZERO-POWER RESISTANCE VALUE: TABLE I VALUE.
     - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T°K}=R_{298°K}\,e^{\beta\left(\frac{1}{T}-\frac{1}{298}\right)}$
       SEE TABLE II FOR β AND TABULATED VALUES OF R_T.
       BETA VALUES ARE BASED ON READINGS TAKEN AT 0° & 50°C.
3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TEMPERATURE TO CHANGE 63% INTERNALLY FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.
   - G. LEAD MATERIAL: UNCOATED, WELDABLE NICKEL (GRADE
   - H. FINISH: [illegible]
4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

SPECIAL CONDITIONING(CONT'D)

- C. FOLLOWING BURN-IN THE ZERO-POWER RESISTANCE OF EACH UNIT SHALL BE MEASURED AT (3) THREE TEMPERATURES; 0°±0.1°C, 25°±0.1°C AND 50±0.1°C. THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT. A CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF PARA 4A AND 4B ABOVE SHALL ALSO BE SUPPLIED WITH EACH LOT SHIPPED.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
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MATERIAL SEE NOTES
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DRAWN J.W. E. Crapi DATE 13 Aug 63
CHECKED J. Ruggen 28 Aug 63 / H. Marple
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL W Kupfer 10 Sep 63

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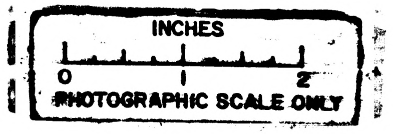
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006715
SCALE NONE
WT
SHEET 1 OF 2



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1006715 D

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	WK
A	REVISED PER TDRR 04399		RAK WK.
C	REVISED PER TDRR 08861	6/2/64	WK
D	REVISED PER TDRR 13252	10/14	R.S.

TABLE I

DASH NO.	NOMINAL ZERO-POWER RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC AT 25°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C	TIME CONSTANT SECONDS	DIMENSIONS		
					A MAX	B MAX	C
-1	100K ± 1%	CURVE D	+ 10° 2.3 MIN	% 12 MIN	.120	.625	.017 .015
-2	10K ± 10%	CURVE B	2.3 MIN	12 MIN	.120	.625	.017 .015

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$		
TEMP °C	CURVE "D" $\beta = 3900 \pm 55$	CURVE "B" $\beta = 3450 \pm 80$
-60	145.2	77.0
-50	68.9	40.2
-40	34.3	22.0
-30	17.9	12.5
-20	9.79	7.42
-10	5.56	4.54
0	3.27	2.85
+10	1.99	1.84
+20	1.25	1.22
+25	1.000	1.000
+30	.805	.825
+40	.532	.570
+50	.360	.402
+60	.248	.289
+70	.175	.212
+80	.125	.157
+90	.091	.119
+100	.0675	.0910
+110	.0508	.0705

TABLE III

EXAMINATION OR TEST	REQUIREMENT PARAGRAPHS
GENERAL QUALIFICATION REQUIREMENTS	PARAGRAPHS 3.2 THROUGH 3.9.2 OF ND -1002057
GROUP I (ALL SAMPLES)	
VISUAL & MECHANICAL	PARA 4.2.1 OF ND 1002057
ZERO-POWER RESISTANCE	PARA 4.5.2 OF MIL-T-23648 EXCEPT MEASURE AT +25 & 50°C
DISSIPATION CONSTANT	PARA 4.5.4 OF MIL-T-23648
THERMAL TIME CONSTANT	PARA 4.5.5 OF MIL-T-23648
MAXIMUM POWER RATING	PARA 3.3.7 OF MIL-T-23648 EXCEPT MEASURE POWER THAT PRODUCES TEMP. RISE OF +80°C
GROUP II (1/3 OF SAMPLES)	
RESISTANCE - TEMPERATURE CHARACTERISTICS	PARA 4.5.11 OF MIL-T-23648 EXCEPT SEQUENCE 7 WILL BE 105°C & SEQUENCE 8 WILL NOT BE USED
TEMPERATURE CYCLING	PARA 4.5.8 OF MIL-T-23648 EXCEPT USE TEST CONDITION A OF MIL-STD-202
THERMAL STABILITY	PARA 4.5.6 OF MIL-T-23648 EXCEPT TEMPERATURE IN PARA 4.5.6.2 WILL BE +105 ± 2°C
LOW TEMPERATURE STORAGE	PARA 4.5.7 OF MIL-T-23648 EXCEPT LOW TEMP WILL BE -55 ± 3°C
TERMINAL STRENGTH	PARA 4.5.10 OF MIL-T-23648
GROUP III (1/3 OF SAMPLES)	
VIBRATION	PARA 4.2.11 OF ND 1002057 (SEE NOTE 1)
SHOCK	PARA 4.2.12 OF ND 1002057 (SEE NOTE 1)
MOISTURE RESISTANCE	PARA 4.5.13 OF MIL-T-23648(SEE NOTE 2)
GROUP IV (1/3 OF SAMPLES)	
LOAD LIFE	PARA 4.5.15 OF MIL-T-23648 EXCEPT INITIAL RESISTANCE MAY BE MEASURED PRIOR TO START OF LIFE. MAX OPERATING TEMP IS +105°C
LEAD COMPOSITION	PARA 4.2.16 OF ND 1002057

NOTE 1

THE AMOUNT OF POWER TO BE APPLIED WILL BE THAT NECESSARY TO RAISE THE THERMISTOR TEMP. TO APPROX. +65°C UNDER NORMAL FREE AIR CONDITIONS. ZERO POWER RESISTANCE WILL BE MEASURED BEFORE & AFTER TEST PER PARA 4.5.2 OF MIL-T-23648.

NOTE 2

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LIST OF MATERIALS			

MASTER

NEXT ASSY	USED ON
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DRAWN Ray Wheeler DATE 20 Aug 63
CHECKED J Ruggieri 28 Aug 63 / H Maynard
APPROVAL G. MAYO 9/4/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/1/63
MIT APPROVAL W K 10 Sep 63

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RESISTOR, TEMPERATURE VARIABLE, NEGATIVE COEF
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006715
SCALE NONE WT SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

	1006715

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	wK

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NOTES:

1. GENERAL REQUIREMENTS:
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   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - D. MARKING: UNIT PACKAGES SHALL BE LEGIBLY MARKED PER MIL-STD-129, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER), MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, AND DATE OF MANUFACTURE.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) CERTIFICATE OF COMPLIANCE: COMPLIANCE WITH THE LEAD AND VARNISH MATERIAL REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.

       EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) RESISTANCE VALUE: TABLE I VALUE.
     - (2) RESISTANCE-TEMPERATURE CHARACTERISTIC: $R_{T^\circ K}=R_{298^\circ K}\,e^{\beta\left(\frac{1}{T}-\frac{1}{298}\right)}$ SEE TABLE II FOR β AND TABULATED VALUES OF R_T.
3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
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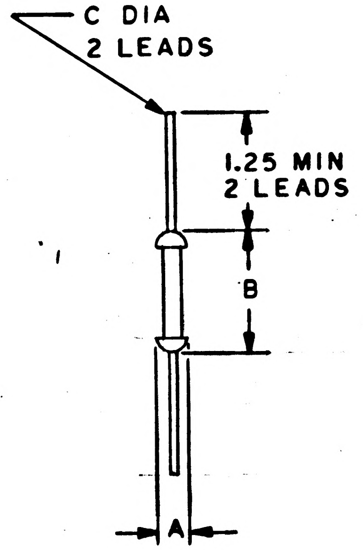
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.
   - G. LEAD MATERIAL: UNCOATED WELDABLE NICKEL (GRADE
   - H. FINISH: [illegible]
4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER



SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
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DWG. NO.
CONTRACT

DRAWN J.W.C. Campi DATE 13 Aug 63
CHECKED J. Ruggeri H. Maynard 28 Aug 63
APPROVAL G. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/10/63
MIT APPROVAL W Kupfer 10 Sep 63

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RESISTOR, TEMPERATURE VARIABLE, NEGATIVE COEF

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006715
SCALE NONE	WT	SHEET 1 OF 2

1006715

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006715

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10 Sep 63	WK

TABLE I

DASH NO.	NOMINAL RESISTANCE OHMS	RESISTANCE -TEMPERATURE CHARACTERISTIC AT 25°C NOTE 2.B(2)	DISSIPATION CONSTANT MW/°C	TIME CONSTANT SECONDS	DIMENSIONS		
					A MAX	B MAX	C
-1	100K ± 1%	CURVE D	2.5 ± 10%	20 ± 20%	.120	.625	.017 .015
-2	10K ± 10%	CURVE B	2.5 ± 10%	20 ± 20%	.120	.625	.017 .015

TABLE II

NOMINAL RATIO $R_T/R_{25°C}$		
TEMP °C	CURVE "D" β =3900±55	CURVE "B" β =3400±80
-60	145.2	77.0
-50	68.9	40.2
-40	34.3	22.0
-30	17.9	12.5
-20	9.79	7.42
-10	5.56	4.54
0	3.27	2.85
+10	1.99	1.84
+20	1.25	1.22
+25	1.000	1.000
+30	.805	.825
+40	.532	.570
+50	.360	.402
+60	.248	.289
+70	.175	.212
+80	.125	.157
+90	.091	.119
+100	.0675	.0910
+110	.0508	.0705
+120	.0387	.0552
+130	.0299	.0437
+140	.0233	.0350
+150	.0184	.0285

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 20 Aug 63
CHECKED J Ruggeri / H Macphail 24 Aug 63
APPROVAL E. MAYO 9/9/63
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/11/63
MIT APPROVAL W Kupfer 10 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, TEMPERATURE VARIABLE, NEGATIVE COEF

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006715
SCALE NONE
WT
SHEET 2 OF 2

MASTER

1006715

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006717

REVISIONS 03039			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03039	10 Sep 63	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, AND/OR EXPIRATION DATE, NASA DRAWING NUMBER, REVISION LETTER, AND QUANTITY ENCLOSED.

2. DESIGN:

   A. MATERIAL SHALL BE AN EPOXY RESIN CONTAINING A NON-METALLIC FILLER.

   B. THIS MATERIAL, WHEN CURED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, SHALL PRODUCE A POTTING COMPOUND HAVING THE FOLLOWING PROPERTIES:

      (1) GOOD MACHINEABILITY
      (2) SPECIFIC GRAVITY: 2.2 TO 2.4
      (3) SPECIFIC HEAT: 0.3 CALORIES PER GRAM MINIMUM
      (4) COEFFICIENT OF LINEAR EXPANSION (+32°F TO +150°F): 18 X 10^{-6} IN/IN/°F MAXIMUM.
      (5) MOISTURE ABSORPTION: 0.08 PERCENT MAXIMUM AFTER 10 DAYS AT 96 PERCENT RELATIVE HUMIDITY.
      (6) DIELECTRIC CONSTANT, 1 KC: 5.5 MINIMUM
      (7) DISSIPATION FACTOR, 1 KC: 0.010 MAXIMUM
      (8) DC VOLUME RESISTIVITY: 10^{14} OHMS PER CENTIMETER MINIMUM
      (9) DIELECTRIC STRENGTH: 330 VOLTS PER MIL, MINIMUM
      (10) THERMAL CONDUCTIVITY : 12 BTU/HR/FT^2/°F/IN, MINIMUM
      (11) HEAT DISTORTION TEMPERATURE: 200°F MINIMUM AT 264 PSI
      (12) HARDNESS, SHORE D (+73°F TO +160°F): 92 MINIMUM
      (13) SETTLING: 0.5 IN/FT MAXIMUM

   C. THIS COMPOUND SHALL HAVE A SHELF LIFE OF OVER ONE YEAR WHEN STORED IN UNOPENED CANS AT AN AVERAGE TEMPERATURE BELOW 80°F.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 7 Aug 63
CHECKED 9 Aug 63
APPROVAL
APPROVAL Eldon C Hall 9 Sept 63
NASA APPROVAL 9/11/63
MIT APPROVAL 10 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

EPOXY RESIN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006717
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006720 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03167	9/17/63	[illegible]
A	REVISED PER TDRR 06866	3/17/64	WK

(4)

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

   A. PROPERTIES:

      (1) COLOR: WHITE.

      (2) VISCOSITY: 80 TO 180 POISES PER ASTM D-1084

      (3) SPECIFIC GRAVITY: 1.16 TO 1.20 PER ASTM D-792.

3. DESIGN:

   A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES WHEN CURED:

      (1) HARDNESS, SHORE A SCALE DUROMETER POINTS: 40-55 PER ASTM D676.

      (2) TENSILE STRENGTH, PSI: 250 MIN PER ASTM D-412.

      (3) ELONGATION, PERCENT: 100 MIN PER ASTM D-412.

      (4) VOLUME RESISTIVITY, OHM-CM: 1 X 10^{12} MIN. PER ASTM D257.

      (5) DIELECTRIC STRENGTH, VOLTS PER MIL: 300 MINIMUM PER ASTM D-149.

   B. SHELF LIFE, 70°F: 6 MONTHS MINIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

ORIGINAL SOURCE OF SUPPLY:

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 7 Sept 63
CHECKED [illegible] 10 Sept 63
APPROVAL
APPROVAL Eldon C Hall 16 Sept 63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE RUBBER
ROOM TEMPERATURE VULCANIZING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006720
SCALE WT SHEET 1 OF 1

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

—	1006720

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03167	9/17/70	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:
   - A. PROPERTIES:
     - (1) COLOR: WHITE.
     - (2) VISCOSITY: 80 TO 180 POISES PER ASTM D-1824.
     - (3) SPECIFIC GRAVITY: 1.16 TO 1.20 PER ASTM D-792.

3. DESIGN:
   - A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES WHEN CURED:
     - (1) HARDNESS, SHORE A SCALE DUROMETER POINTS: 40-50 PER ASTM D676.
     - (2) TENSILE STRENGTH, PSI: 300-400 PER ASTM D-412.
     - (3) ELONGATION, PERCENT: 170-190 PER ASTM D-412.
     - (4) VOLUME RESISTIVITY, OHM-CM: 6 X 10^{14} PER ASTM D257.
     - (5) DIELECTRIC STRENGTH, VOLTS PER MIL: 600-650 PER ASTM D-149.
   - B. SHELF LIFE, 70°F: 6 MONTHS MINIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.D.R. Wheeler DATE 7 Sept 63
CHECKED J. Ruggieri H. Maynard 10 Sept 63
APPROVAL
APPROVAL Eldon C Hall 16 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 9/17/70

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE RUBBER
ROOM TEMPERATURE VULCANIZING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006720
SCALE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

-	1006721

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03167	9/17/63	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND DATE OF MANUFACTURE OR CODING AND QUANTITY ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

   A. PROPERTIES:

      (1) COLOR (GARDNER): 4.0 MAXIMUM.

      (2) VISCOSITY AT 25°C: 43 CENTIPOISES MINIMUM PER ASTM D-1824.

      (3) SPECIFIC GRAVITY AT 25°C: 1.05 MINIMUM PER ASTM D-792.

3. DESIGN:

   A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES:

      (1) BOILING POINT: ABOVE 400°F AT 10 MM MINIMUM.

      (2) FLASH POINT (OPEN CUP): ABOVE 400°F.

      (3) TIN CONTENT: 18.0 TO 19.5 PERCENT.

      (4) ACID NUMBER: 170 TO 180.

      (5) CHLORINE CONTENT: 0.2 PERCENT MAXIMUM.

      (6) FREEZE POINT: 17.0°C MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

[illegible] THERM[illegible] CORPORAT

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN D. R. Wheeler DATE 10 Sept 63
CHECKED J. Ruggiero / H. Maynard 10 Sept 63
APPROVAL
APPROVAL Eldon C Hall 16 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CURING AGENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006721
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006722 A

REVISIONS TDRR 04003

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A		
A	REVISED PER TDRR 32224	12-10-66	JPW CP

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, QUANTITY ENCLOSED, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   SEE TABLE I

3. DESIGN:

   A. POUR POINT: -60°F

   B. FLASH POINT: ABOVE 600°F PER ASTM D-92

   C. VOLATILITY (PERCENT WT LOSS, 24 HOURS AT 150°C): 0.5 PERCENT MAXIMUM.

   D. STORAGE AND SHELF LIFE: WHEN STORED IN CLEAN CLOSED CONTAINERS, SHALL HAVE A SHELF LIFE OF AT LEAST ONE (1) YEAR.

TABLE I

DASH NO.	VISCOSITY (AT 25°C) CENTISTROKES ±5% PER ASTM D-1824	SPECIFIC GRAVITY PER ASTM D-1475	APPEARANCE
-000	500	0.97	CLEAR AND COLORLESS
-001	50	0.96	CLEAR AND COLORLESS

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 21 Sep 63
CHECKED 24 Sept 63
APPROVAL
APPROVAL Eldon C Hall 14 Oct 63
NASA APPROVAL 10/11/63
MIT APPROVAL 17 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

THINNER, SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006722
SCALE NONE
WT
SHEET 1 OF 1

1006722 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006722 A

REVISIONS TDRR 04003			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A		
A	REVISED PER TDRR 32224	12-10-66	JPW / CP

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, QUANTITY ENCLOSED, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   SEE TABLE I

3. DESIGN:

   A. POUR POINT: -60°F

   B. FLASH POINT: ABOVE 600°F PER ASTM D-92

   C. VOLATILITY (PERCENT WT LOSS, 24 HOURS AT 150°C): 0.5 PERCENT MAXIMUM.

   D. STORAGE AND SHELF LIFE: WHEN STORED IN CLEAN CLOSED CONTAINERS, SHALL HAVE A SHELF LIFE OF AT LEAST ONE (1) YEAR.

TABLE I

DASH NO.	VISCOSITY (AT 25°C) CENTISTROKES ±5% PER ASTM D-1824	SPECIFIC GRAVITY PER ASTM D-1475	APPEARANCE
-000	500	0.97	CLEAR AND COLORLESS
-001	50	0.96	CLEAR AND COLORLESS

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 21 Sep 63
CHECKED J. Ruggiero / A. Maynard 24 Sep 63
APPROVAL
APPROVAL Eldon C Hall 14 Oct 63
NASA APPROVAL 10/11/63
MIT APPROVAL 17 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

THINNER, SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006722
SCALE NONE
WT
SHEET 1 OF 1

1006722 A

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

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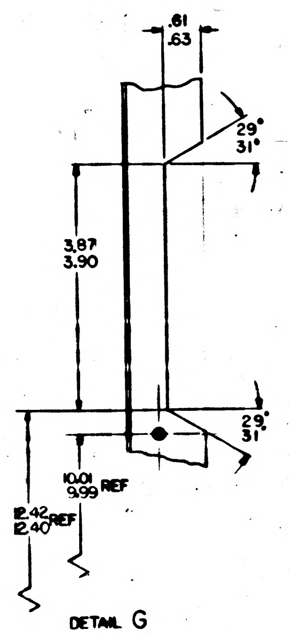
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR 03995	[illegible]	
A	CHANGED PER TDRR 07353 DR S.T. Quifun CHK [illegible] APPD [illegible] Maynard		KEB

NOTES

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND1015404, CLASS II.
   - B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND1002019 ON AN INSIDE SURFACE NEAR (BUT NOT ON) THE REAR DOOR. MARKING SHALL INCLUDE THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER) MANUFACTURERS NAME AND/OR SYMBOL, PART NUMBER, LOT CODE OR SERIAL NO.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL: 14 GAUGE MINIMUM COLD ROLLED STEEL PER QQ-S-692 THROUGHOUT
     - (2) FINISH:
       PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915 TYPE I ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.
       PAINT: 2 COATS TT-E-529 SEMIGLOSS ENAMEL CLASS B COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).
     - (3) CONSTRUCTION: WELDED THROUGHOUT. ALL WELDS TO BE GROUND FLUSH.
     - (4) R.F.I. SHIELDING: ALL FLANGES AND DOOR OPENING TO BE RFI SHIELDED AS SHOWN (SHADED FLANGE AREA TO BE UNSHIELDED)
     - (5) CERTIFICATION: COMPLIANCE WITH MATERIAL, FINISH AND CONSTRUCTION REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

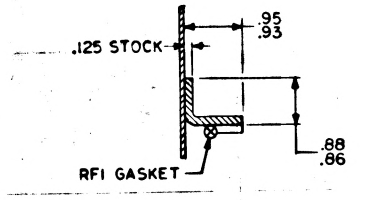


.61
.63
29°
31°
3.87
3.90
29°
31°
10.01
9.99 REF
12.42
12.40 REF

DETAIL G
SCALE 1/1

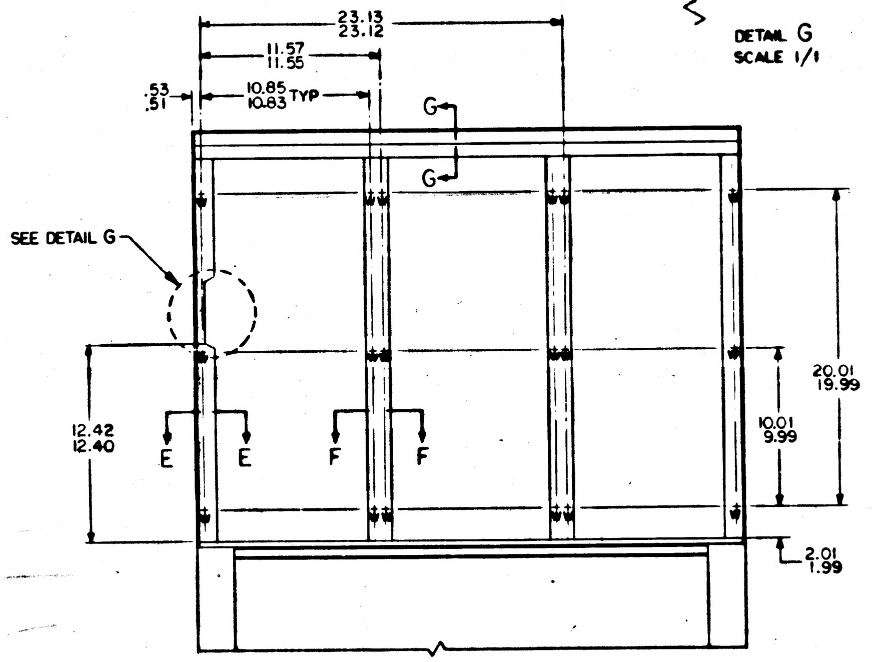
FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 03995 DATE 10/17/63



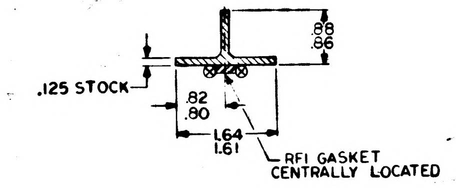
.125 STOCK
.95
.93
.88
.86
RFI GASKET

SECTION E-E



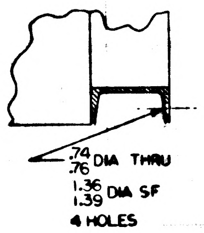
23.13
23.12
11.57
11.55
.53
.51
10.85
10.83 TYP
G
G
SEE DETAIL G
20.01
19.99
12.42
12.40
10.01
9.99
E
E
F
F
2.01
1.99

VIEW C-C
ROTATED 15° CCW
SEE SHEET 2



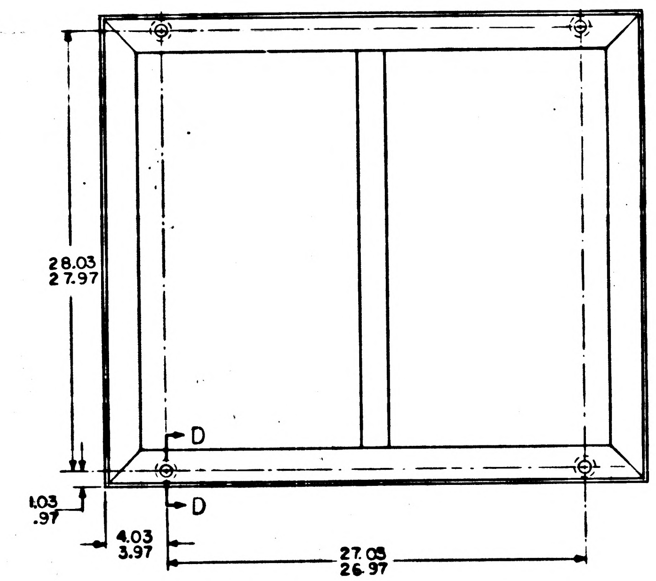
.125 STOCK
.88
.86
.82
.80
1.64
1.61
RFI GASKET
CENTRALLY LOCATED

SECTION F-F



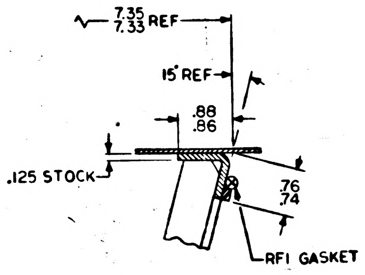
.74
.76 DIA THRU
1.36
1.39 DIA SF
4 HOLES

SECTION D-D



28.03
27.97
D
D
1.03
.97
4.03
3.97
27.03
26.97

VIEW D-D
SEE SHEET 2



7.35
7.33 REF
15° REF
.88
.86
.125 STOCK
.76
.74
RFI GASKET

SECTION G-G

A	A	A
SH 1	SH 2	SH 3

REVISION STATUS OF SHEETS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-498
DRAWN F.L. Wesham DATE 25 Sep 63
CHECKED [illegible] 8 OCT 63
APPROVAL [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	J	1006724

SCALE NONE WT SHEET 1 OF 3

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR 03995		
A	CHANGED PER TDRR 07353 DR S.T. CHK APPD		KEB

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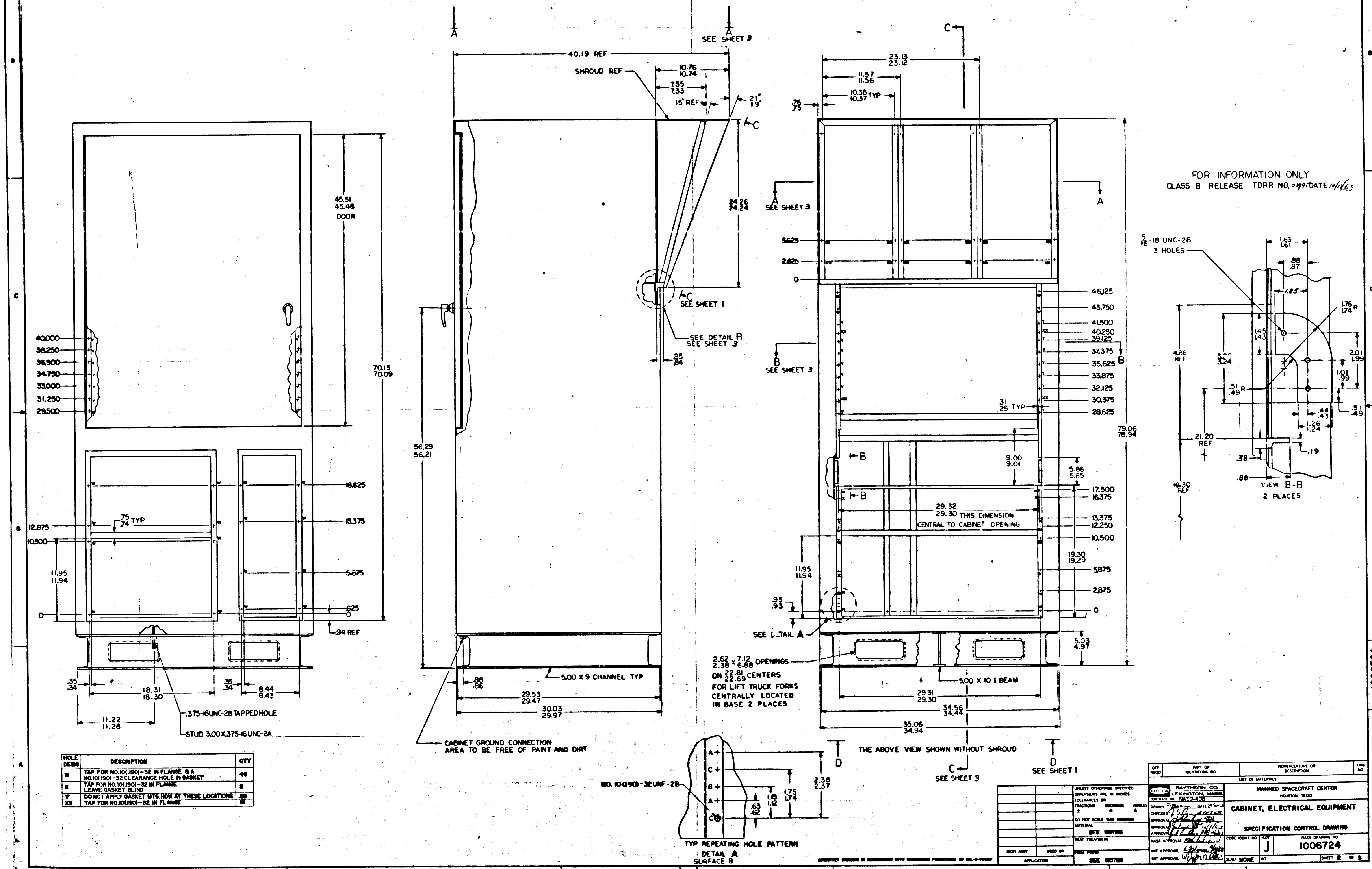
CLASS B RELEASE TDRR NO. 0399 DATE 10/17/63


A
SEE SHEET 3
40.19 REF
SHROUD REF
10.76 / 10.74
7.35 / 7.33
15° REF
21° / 19°
C
24.26 / 24.24
SEE SHEET 1
SEE DETAIL B
SEE SHEET 3
.85 / .84
45.51 / 45.48 DOOR
70.15 / 70.09
56.29 / 56.21
40.000
38.250
36.500
34.750
33.000
31.250
29.500
18.625
13.375
5.875
.625
0
.75 / .74 TYP
12.875
10.500
11.95 / 11.94
.94 REF
.35 / .34
18.31 / 18.30
8.44 / 8.43
11.22 / 11.28
.375-16UNC-2B TAPPED HOLE
STUD 3.00 X .375-16UNC-2A
CABINET GROUND CONNECTION AREA TO BE FREE OF PAINT AND DIRT
.88 / .86
5.00 X 9 CHANNEL TYP
29.53 / 29.47
30.03 / 29.97
23.13 / 23.12
11.57 / 11.56
10.38 / 10.37 TYP
.76 / .75
5.625
2.625
46.125
43.750
41.500
40.250
39.125
37.375
35.625
33.875
32.125
30.375
28.625
B
SEE SHEET 3
.31 / .28 TYP
79.06 / 78.94
9.00 / 9.01
5.86 / 5.85
17.500
16.375
13.375
12.250
10.500
5.875
2.875
0
29.32 / 29.30 THIS DIMENSION CENTRAL TO CABINET OPENING
19.30 / 19.29
11.95 / 11.94
.95 / .93
SEE DETAIL A
5.03 / 4.97
2.62 / 2.38 X 7.12 / 6.88 OPENINGS ON 22.81 / 22.69 CENTERS FOR LIFT TRUCK FORKS CENTRALLY LOCATED IN BASE 2 PLACES
5.00 X 10 I BEAM
29.31 / 29.30
34.56 / 34.44
35.06 / 34.94
THE ABOVE VIEW SHOWN WITHOUT SHROUD
D
SEE SHEET 1
SEE SHEET 3
NO. 10 (.190)-32 UNF-2B
A
C
B
2.38 / 2.37
1.75 / 1.74
1.15 / 1.12
.63 / .62
TYP REPEATING HOLE PATTERN
DETAIL A
SURFACE B
5/16-18 UNC-2B 3 HOLES
1.63 / 1.61
.88 / .87
1.25
1.76 / 1.74 R
1.45 / 1.43
4.66 REF
3.26 / 3.24
2.01 / 1.99
1.01 / .99
.51 / .49 R
.44 / .43
1.26 / 1.24
.51 / .49
21.20 REF
19.30 REF
.38
.88
.19
VIEW B-B 2 PLACES

HOLE DESIG	DESCRIPTION	QTY
W	TAP FOR NO.10(.190)-32 IN FLANGE & A NO.10(.190)-32 CLEARANCE HOLE IN GASKET	46
X	TAP FOR NO.10(.190)-32 IN FLANGE LEAVE GASKET BLIND	8
Y	DO NOT APPLY GASKET MTG. HDW. AT THESE LOCATIONS	28
XX	TAP FOR NO.10(.190)-32 IN FLANGE	16

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
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HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-498
DRAWN F. Wehnau DATE 25 Sep 63
CHECKED J. S. 4 OCT 63
APPROVAL
APPROVAL 10/4/63
APPROVAL RB 10/4/63
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 17 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE J | NASA DRAWING NO 1006724
SCALE NONE | WT | SHEET 2 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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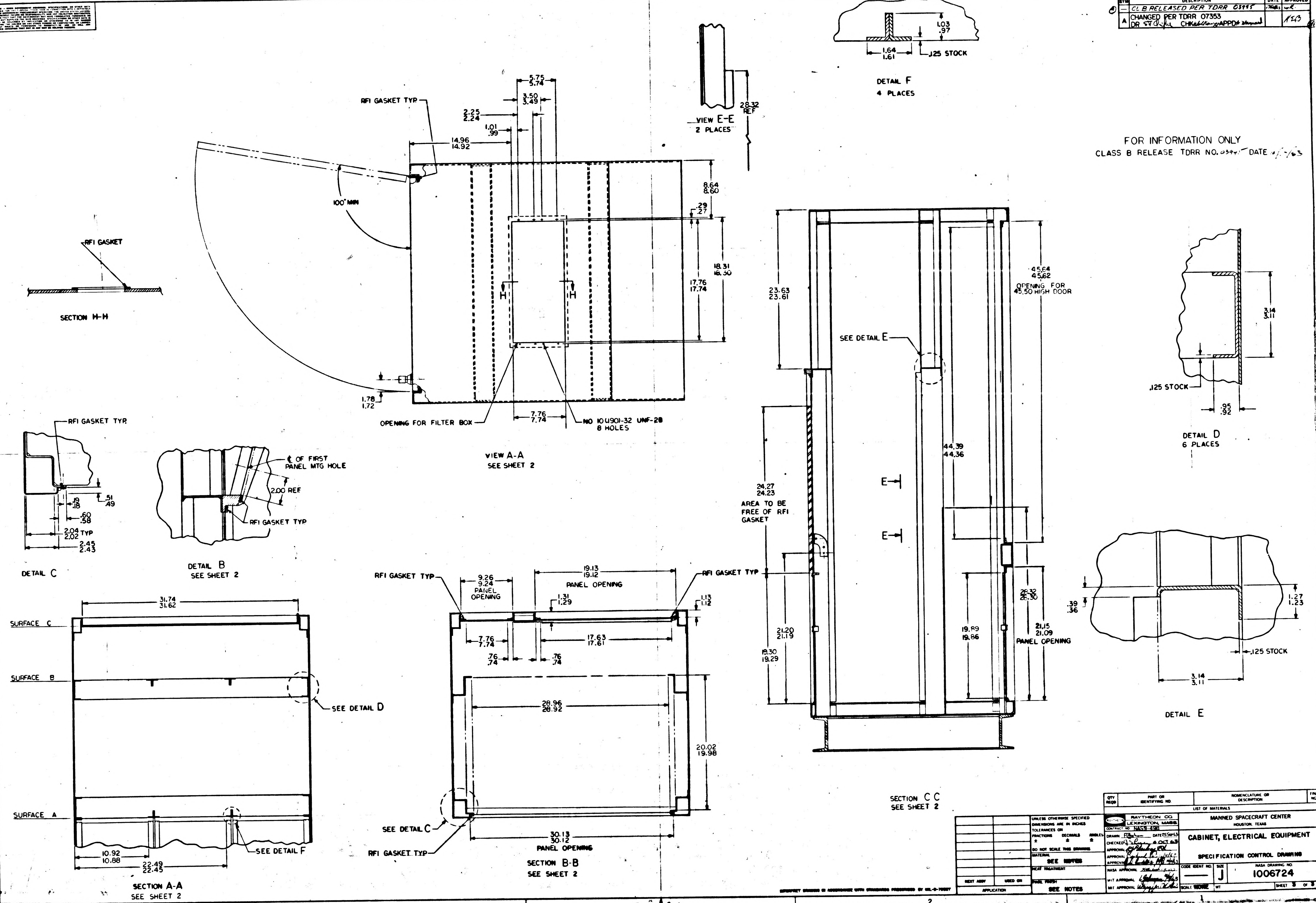
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR 03995		
A	CHANGED PER TDRR 07353 DR SV CHK APPD		KEB

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 03995 DATE 10/-/63



1006724
DETAIL F
4 PLACES
1.03
.97
1.64
1.61
.125 STOCK
VIEW E-E
2 PLACES
28.32 REF
RFI GASKET TYP
5.75
5.74
3.50
3.49
2.25
2.24
1.01
.99
14.96
14.92
100° MIN
8.64
8.60
.29
.27
18.31
18.30
17.76
17.74
H
H
1.78
1.72
OPENING FOR FILTER BOX
7.76
7.74
NO 10(.190)-32 UNF-2B
8 HOLES
VIEW A-A
SEE SHEET 2
RFI GASKET
SECTION H-H
RFI GASKET TYP
.19
.18
.51
.49
.60
.58
2.04
2.02 TYP
2.45
2.43
DETAIL C
℄ OF FIRST PANEL MTG HOLE
2.00 REF
RFI GASKET TYP
DETAIL B
SEE SHEET 2
23.63
23.61
45.64
45.62
OPENING FOR 45.50 HIGH DOOR
SEE DETAIL E
44.39
44.36
24.27
24.23
AREA TO BE FREE OF RFI GASKET
E
E
28.32
28.30
21.20
21.19
19.30
19.29
19.89
19.86
21.15
21.09
PANEL OPENING
SECTION C C
SEE SHEET 2
3.14
3.11
.125 STOCK
.95
.92
DETAIL D
6 PLACES
.39
.36
1.27
1.23
.125 STOCK
3.14
3.11
DETAIL E
31.74
31.62
SURFACE C
SURFACE B
SEE DETAIL D
SURFACE A
SEE DETAIL F
10.92
10.88
22.49
22.45
SECTION A-A
SEE SHEET 2
RFI GASKET TYP
9.26
9.24
PANEL OPENING
19.13
19.12
PANEL OPENING
RFI GASKET TYP
1.31
1.29
1.13
1.12
7.76
7.74
17.63
17.61
.76
.74
.76
.74
28.96
28.92
20.02
19.98
SEE DETAIL C
RFI GASKET TYP
30.13
30.12
PANEL OPENING
SECTION B-B
SEE SHEET 2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS9-498
DRAWN DATE 25 Sep 63
CHECKED 4 OCT 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE J
NASA DRAWING NO. 1006724
SCALE NONE
WT
SHEET 3 OF 3

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR 03995	12/20	

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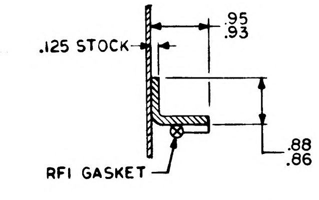
NOTES

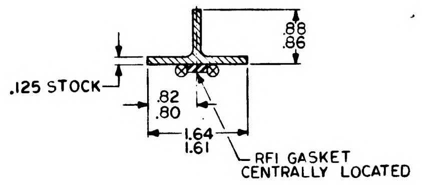
1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND1015404, CLASS II.
   - B. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130, ON AN INSIDE SURFACE NEAR (BUT NOT ON) THE REAR DOOR. MARKING SHALL INCLUDE THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER) MANUFACTURERS NAME AND/OR SYMBOL, PART NUMBER, LOT CODE OR SERIAL NO.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL REQUIREMENTS:
   - (1) MATERIAL: 14 GAUGE MINIMUM COLD ROLLED STEEL THROUGH OUT.
   - (2) FINISH:
     PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915 TYPE I ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.
     PAINT: 2 COATS TT-E-529 SEMIGLOSS ENAMEL CLASS B COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).
   - (3) CONSTRUCTION: WELDED THROUGHOUT. ALL WELDS TO BE GROUND FLUSH.
   - (4) R.F.I. SHIELDING: ALL FLANGES AND DOOR OPENING TO BE RFI SHIELDED AS SHOWN (SHADED FLANGE AREA TO BE UNSHIELDED)
   - (5) CERTIFICATION: COMPLIANCE WITH MATERIAL, FINISH AND CONSTRUCTION REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

FOR INFORMATION ONLY

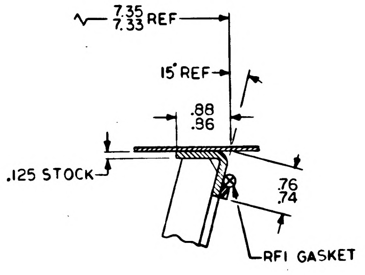
CLASS B RELEASE TDRR NO. 03995 DATE 10/17/63


.125 STOCK
.95
.93
.88
.86
RFI GASKET

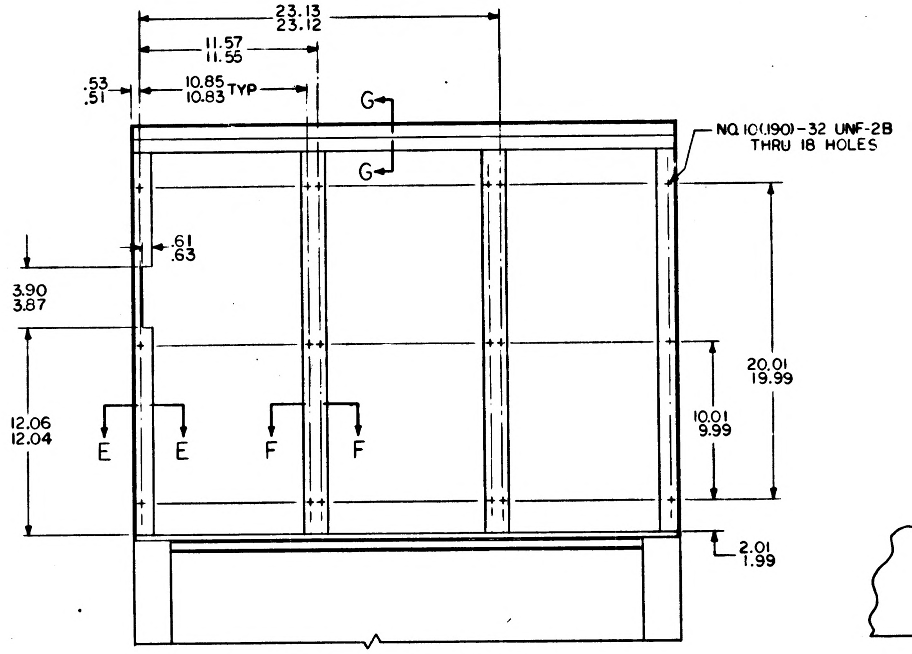
SECTION E-E


.88
.86
.125 STOCK
.82
.80
1.64
1.61
RFI GASKET
CENTRALLY LOCATED

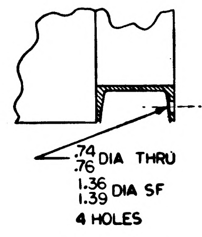
SECTION F-F


7.35
7.33 REF
15° REF
.88
.86
.125 STOCK
.76
.74
RFI GASKET

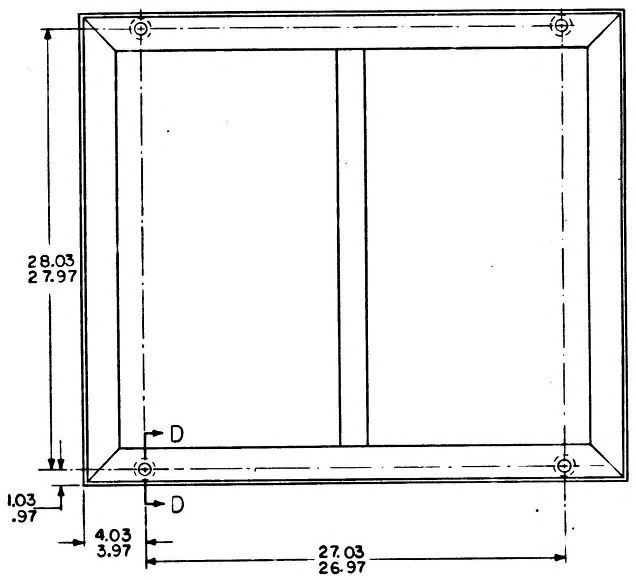
SECTION G-G


23.13
23.12
11.57
11.55
.53
.51
10.85
10.83 TYP
G
G
NO. 10(.190)-32 UNF-2B
THRU 18 HOLES
.61
.63
3.90
3.87
12.06
12.04
E
E
F
F
20.01
19.99
10.01
9.99
2.01
1.99

VIEW C-C
ROTATED 15° CCW
SEE SHEET 2


.74
.76 DIA THRU
1.36
1.39 DIA SF
4 HOLES

SECTION D-D


28.03
27.97
D
D
1.03
.97
4.03
3.97
27.03
26.97

VIEW D-D
SEE SHEET 2

SH 1	SH 2	SH 3
REVISION STATUS OF SHEETS		

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

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LIST OF MATERIALS			

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TOLERANCES ON
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HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS
CONTRACT NO NAS9-498
DRAWN F. Waham DATE 25 Sep 63
CHECKED 4 OCT 63
APPROVAL
APPROVAL 10/4/63
APPROVAL 10/4/63
NASA APPROVAL
MIT APPROVAL 10/9/63
MIT APPROVAL 17 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE J
NASA DRAWING NO 1006724
SCALE NONE
WT
SHEET 1 OF 3

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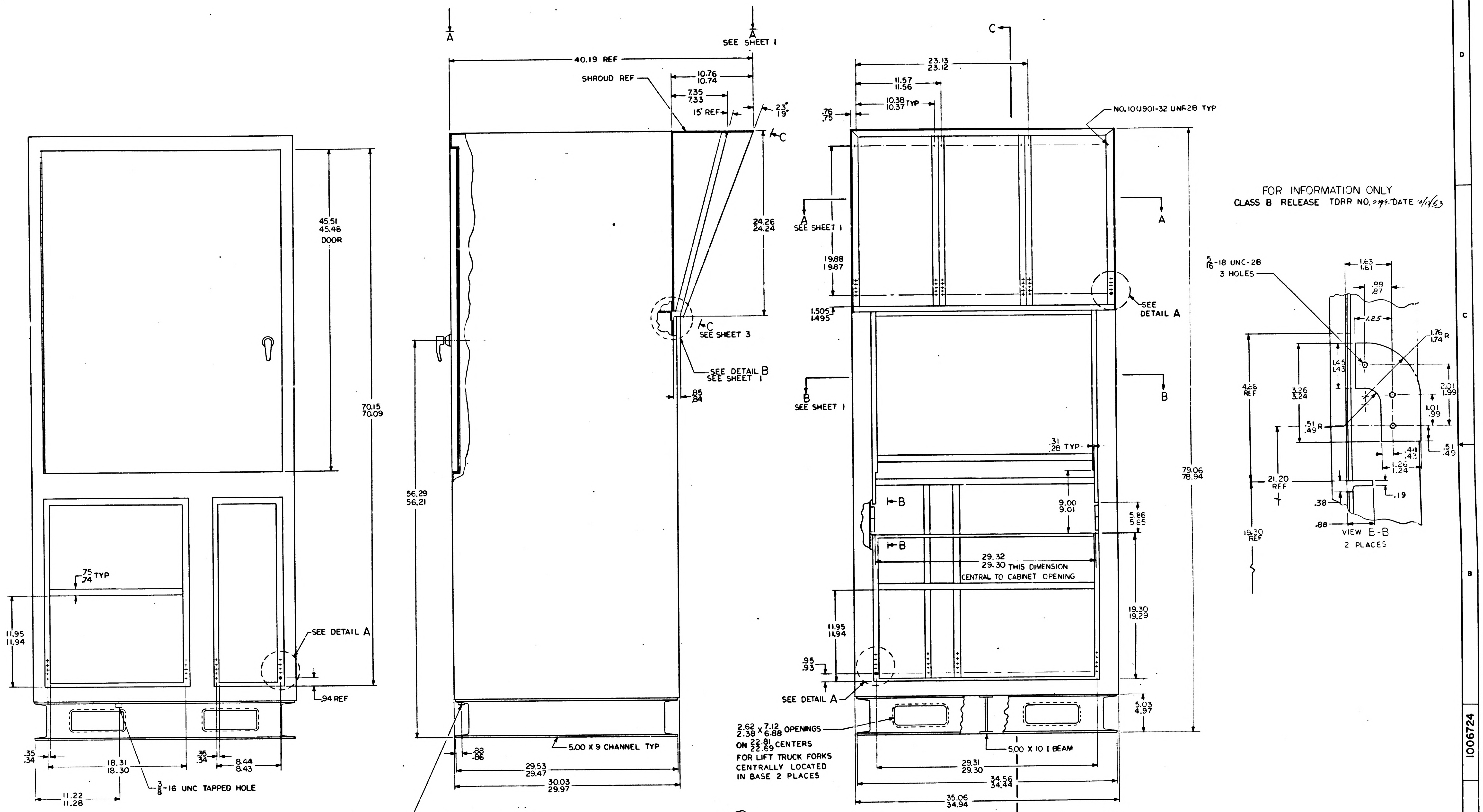
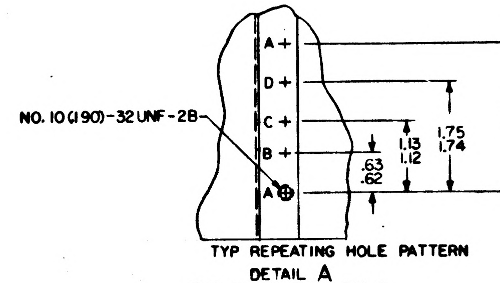
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR 23995	[illegible]	[illegible]

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 2399 DATE 10/18/63


A
SEE SHEET 1
40.19 REF
SHROUD REF
10.76
10.74
7.35
7.33
15° REF
23°
19°
C
45.51
45.48
DOOR
70.15
70.09
24.26
24.24
SEE SHEET 3
SEE DETAIL B
SEE SHEET 1
.85
.84
56.29
56.21
.75
.74 TYP
11.95
11.94
SEE DETAIL A
.94 REF
.35
.34
18.31
18.30
.35
.34
8.44
8.43
11.22
11.28
3/8-16 UNC TAPPED HOLE
.88
.86
5.00 X 9 CHANNEL TYP
29.53
29.47
30.03
29.97
CABINET GROUND CONNECTION
AREA TO BE FREE OF PAINT AND DIRT
23.13
23.12
11.57
11.56
10.38
10.37 TYP
.76
.75
NO. 10(.190)-32 UNF-2B TYP
19.88
19.87
1.505
1.495
SEE DETAIL A
B
SEE SHEET 1
.31
.28 TYP
9.00
9.01
5.86
5.65
29.32
29.30 THIS DIMENSION
CENTRAL TO CABINET OPENING
19.30
19.29
79.06
78.94
11.95
11.94
.95
.93
SEE DETAIL A
5.03
4.97
2.62 X 7.12
2.38 X 6.88 OPENINGS
ON 22.81
22.69 CENTERS
FOR LIFT TRUCK FORKS
CENTRALLY LOCATED
IN BASE 2 PLACES
5.00 X 10 I BEAM
29.31
29.30
34.56
34.44
35.06
34.94
D
SEE SHEET 1
D
SEE SHEET 3
THE ABOVE VIEW SHOWN WITHOUT SHROUD
5/16-18 UNC-2B
3 HOLES
1.63
1.61
.99
.87
1.25
1.76
1.74 R
4.66
REF
3.26
3.24
1.45
1.43
2.01
1.99
1.01
.99
.51
.49 R
.40
.43
1.26
1.24
.51
.49
21.20
REF
.19
.38
.88
19.30
REF
VIEW B-B
2 PLACES


A
D
C
B
A
NO. 10(.190)-32 UNF-2B
2.38
2.37
1.75
1.74
1.13
1.12
.63
.62

TYP REPEATING HOLE PATTERN
DETAIL A
TYP SURFACES A, B, & C

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH: SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-498
DRAWN F. Weiss DATE 25 Sep 63
CHECKED J. [illegible] 4 OCT 63
APPROVAL [illegible]
APPROVAL [illegible] 10/1/63
APPROVAL [illegible] 10/1/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 10/14/63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT

SPECIFICATION CONTROL DRAWING

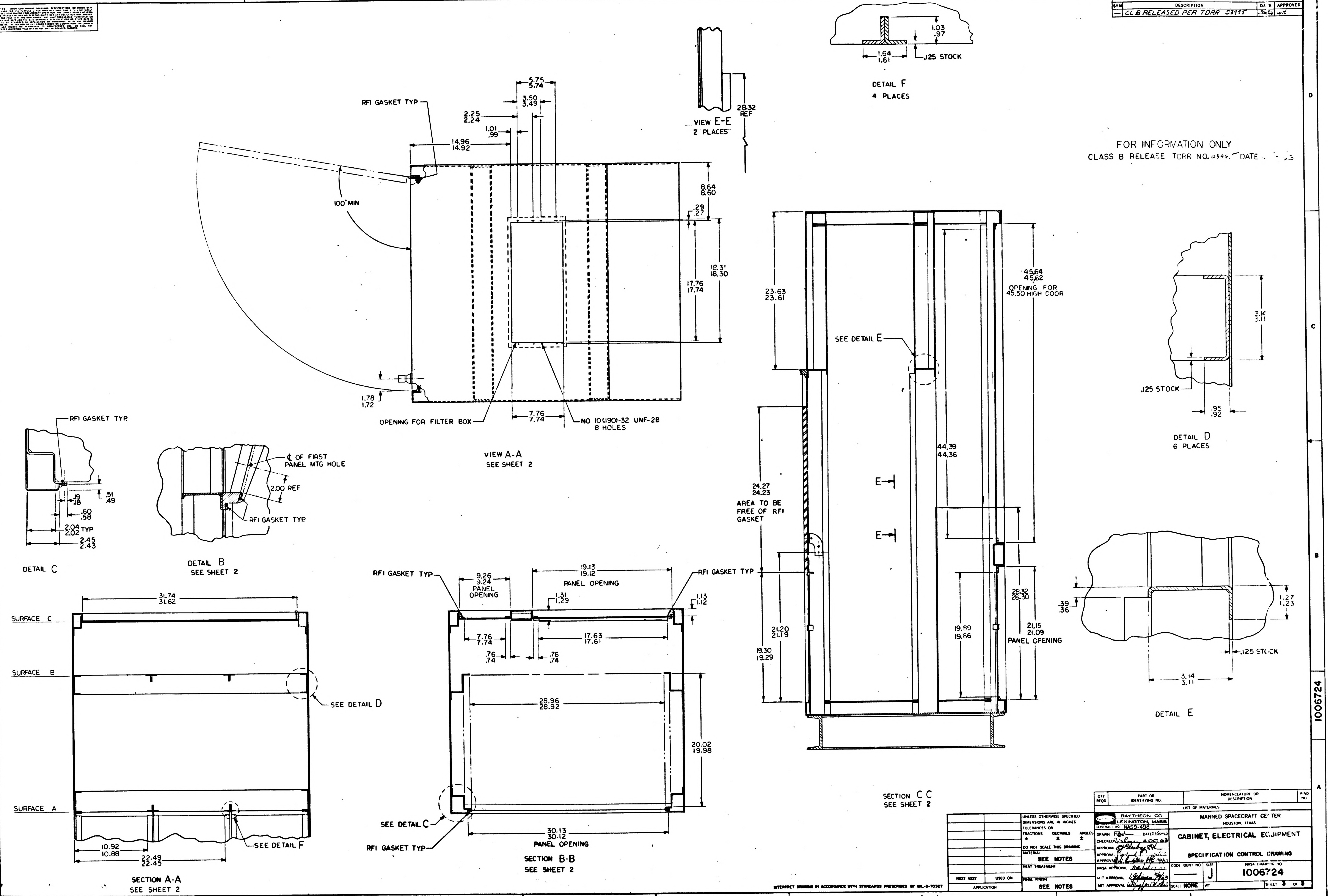
CODE IDENT NO. | SIZE J | NASA DRAWING NO. 1006724
SCALE NONE | WT | SHEET 2 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR 03995		

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03995 DATE



DETAIL F
4 PLACES
1.03
.97
1.64
1.61
.125 STOCK
VIEW E-E
2 PLACES
28.32 REF
RFI GASKET TYP
5.75
5.74
3.50
3.49
2.25
2.24
1.01
.99
14.96
14.92
100° MIN
8.64
8.60
.29
.27
18.31
18.30
17.76
17.74
1.78
1.72
OPENING FOR FILTER BOX
7.76
7.74
NO 10(.190)-32 UNF-2B
8 HOLES
VIEW A-A
SEE SHEET 2
23.63
23.61
45.64
45.62
OPENING FOR
45.50 HIGH DOOR
SEE DETAIL E
44.39
44.36
24.27
24.23
AREA TO BE
FREE OF RFI
GASKET
E
E
28.32
28.30
21.20
21.19
19.30
19.29
19.89
19.86
21.15
21.09
PANEL OPENING
SECTION C C
SEE SHEET 2
3.14
3.11
.125 STOCK
.95
.92
DETAIL D
6 PLACES
.39
.36
1.27
1.23
.125 STOCK
3.14
3.11
DETAIL E
RFI GASKET TYP
.51
.49
.19
.18
.60
.58
2.04 TYP
2.02
2.45
2.43
DETAIL C
℄ OF FIRST
PANEL MTG HOLE
2.00 REF
RFI GASKET TYP
DETAIL B
SEE SHEET 2
31.74
31.62
SURFACE C
SURFACE B
SURFACE A
SEE DETAIL D
10.92
10.88
22.49
22.45
SEE DETAIL F
SECTION A-A
SEE SHEET 2
RFI GASKET TYP
9.26
9.24
PANEL
OPENING
19.13
19.12
PANEL OPENING
RFI GASKET TYP
1.31
1.29
1.13
1.12
7.76
7.74
17.63
17.61
.76
.74
.76
.74
28.96
28.92
20.02
19.98
SEE DETAIL C
RFI GASKET TYP
30.13
30.12
PANEL OPENING
SECTION B-B
SEE SHEET 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH
SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-498
DRAWN Fletcher DATE 25 Sep 63
CHECKED J. S. ... 4 OCT 63
APPROVAL
APPROVAL
APPROVAL 10/4/63
NASA APPROVAL
MIT APPROVAL 10/4/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO —
SIZE J
NASA DRAWING NO 1006724
SCALE NONE WT
SHEET 3 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

Ⓜ A 1006730

REVISIONS TDRR 03511

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 04398	1/4/63	EPL WK

REQUIREMENTS:

1. GENERAL:

   A. DRAWING SHALL BE IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIERS NAME, LOT NUMBER, DATE OF MANUFACTURE AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.

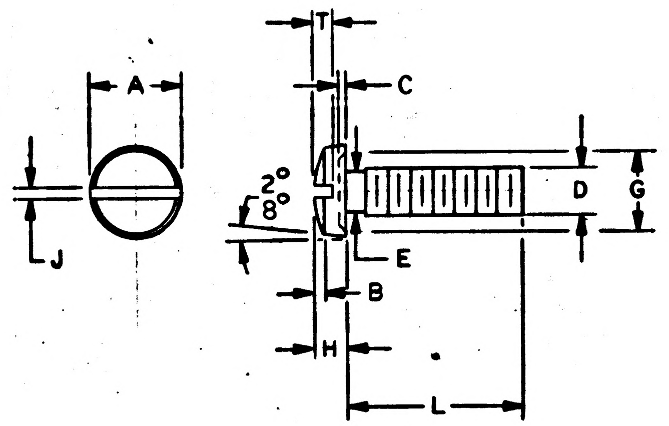
2. ACCEPTANCE AND INSPECTION:

   A. DIMENSIONS: AS SPECIFIED HEREIN.

   B. MATERIAL: BRASS PER QQ-B-613 OR QQ-W-321, NICKEL PLATED PER QQ-N-290. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPPED.

3. DESIGN:

   A. THE THREADS SHALL BE IN ACCORDANCE WITH SCREW-THREAD STANDARDS FOR FEDERAL SERVICES HANDBOOK H-28.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

A	A
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN A Wheeler DATE 19 Sep 63
CHECKED J. Ruggiero W. Maynard 23 Sept 63
APPROVAL
APPROVAL Eldon C Hall 1 Oct 63
NASA APPROVAL
MIT APPROVAL 1 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, SLOTTED HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006730
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006730 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 04398	11/12/63	

NOMINAL SIZE	D		2 (.086)	4 (.112)	66(.138)	8 (.164)	10 (.190)	1/4	5/16	3/8	10(.190)
THREADS PER INCH			56NC	40NC	32NC	32NC	24NC	20UNC	18UNC	16UNC	32UNC
HEIGHT OF OVAL	B	MAX	.018	.025	.032	.039	.045	.061	.077	.094	.045
		MIN	.013	.018	.024	.029	.034	.046	.059	.071	.034
DIAMETER OF UNDERCUT	G	MAX	.141	.184	.226	.269	.312	.410	.513	.615	.312
		MIN	.124	.161	.199	.236	.274	.360	.450	.540	.274
BODY DIAMETER	E	MAX	.0860	.1120	.1380	.1640	.1900	.2500	.3125	.3750	.1900
		MIN	.0717	.0925	.1141	.1399	.1586	.2127	.2712	.3287	.1586
HEAD DIAMETER	A	MAX	.181	.235	.290	.344	.399	.513	.641	.769	.399
		MIN	.171	.223	.275	.326	.378	.488	.609	.731	.378
HEAD HEIGHT	H	MAX	.050	.068	.087	.105	.123	.165	.209	.253	.123
		MIN	.041	.056	.071	.087	.102	.138	.174	.211	.102
SLOT WIDTH	J	MAX	.031	.039	.048	.054	.060	.075	.084	.094	.060
		MIN	.023	.031	.039	.045	.050	.064	.072	.081	.050
SLOT DEPTH	T	MAX	.030	.042	.053	.065	.077	.109	.134	.163	.077
		MIN	.024	.034	.044	.054	.064	.088	.112	.136	.064
DEPTH OF UNDERCUT	C	MAX	.010	.012	.015	.017	.020	.026	.032	.039	.020
		MIN	.005	.007	.010	.012	.015	.021	.027	.034	.015

LENGTH	L	TOLERANCE	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.
THREADS SHALL EXTEND TO WITHIN 2 THREADS OF THE BEARING SURFACE OF THE HEAD, OR CLOSER IF PRACTICABLE.	1/8	+0 -1/32	1	11	24	39					
	3/16		2	12	25	40	58				120
	1/4		3	13	26	41	59				121
	5/16		4	14	27	42	60	76			122
	3/8		5	15	28	43	61	77	92		123
	7/16		6	16	29	44	62	78	93		124
	1/2		7	17	30	45	63	79	94	107	125
	5/8		8	18	31	46	64	80	95	108	126
	3/4		9	19	32	47	65	81	96	109	127
	7/8		10	20	33	48	66	82	97	110	128
	1			21	34	49	67	83	98	111	129
	1-1/4	+0 -1/16		22	35	50	68	84	99	112	130
	1-1/2			23	36	51	69	85	100	113	131
	1-3/4				37	52	70	86	101	114	132
	2				38	53	71	87	102	115	133
MINIMUM COMPLETE THREAD LENGTH OF 1-3/4.	2-1/4	+0 -3/32				54	72	88	103	116	134
	2-1/2					55	73	89	104	117	135
	2-3/4					56	74	90	105	118	136
	3					57	75	91	106	119	137

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 19 Sep 63
CHECKED J. Ruggiero 23 Sept 63
APPROVAL
APPROVAL 1 Oct 63
NASA APPROVAL
MIT APPROVAL 1 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, SLOTTED HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006730
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

— 1006730

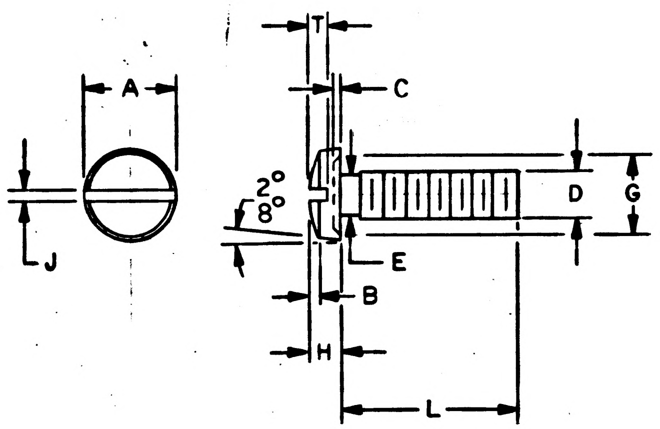
REVISIONS TDRR 03511			
SYM	DESCRIPTION	DATE	APPROVAL
—			

REQUIREMENTS:

1. GENERAL:
   - A. DRAWING SHALL BE IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIERS NAME, LOT NUMBER, DATE OF MANUFACTURE AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.

2. ACCEPTANCE AND INSPECTION:
   - A. DIMENSIONS: AS SPECIFIED HEREIN.
   - B. MATERIAL: BRASS PER QQ-B-611 OR QQ-W-321, NICKEL PLATED PER QQ-N-290. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPPED.

3. DESIGN:
   - A. THE THREADS SHALL BE IN ACCORDANCE WITH SCREW-THREAD STANDARDS FOR FEDERAL SERVICES HANDBOOK H-28.



1006730 -

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R.G.Wheeler DATE 19 Sep 63
CHECKED J. Ruggiero/M. Hayward 23 Sept 63
APPROVAL
APPROVAL Eldon C Hall 1 Oct 63
NASA APPROVAL
MIT APPROVAL W Kupfer 1 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, SLOTTED HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006730
SCALE NONE	WT	SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			

NOMINAL SIZE	D		2 (.086)	4 (.112)	66(.138)	8 (.164)	10 (.190)	1/4	5/16	3/8
THREADS PER INCH			56NC	40NC	32NC	32NC	24NC	20UNC	18UNC	16UNC
HEIGHT OF OVAL	B	MAX	.018	.025	.032	.039	.045	.061	.077	.094
		MIN	.013	.018	.024	.029	.034	.046	.059	.071
DIAMETER OF UNDERCUT	G	MAX	.141	.184	.226	.269	.312	.410	.513	.615
		MIN	.124	.161	.199	.236	.274	.360	.450	.540
BODY DIAMETER	E	MAX	.0860	.1120	.1380	.1640	.1900	.2500	.3125	.3750
		MIN	.0717	.0925	.1141	.1399	.1586	.2127	.2712	.3287
HEAD DIAMETER	A	MAX	.181	.235	.290	.344	.399	.513	.641	.769
		MIN	.171	.223	.275	.326	.378	.488	.609	.731
HEAD HEIGHT	H	MAX	.050	.068	.087	.105	.123	.165	.209	.253
		MIN	.041	.056	.071	.087	.102	.138	.174	.211
SLOT WIDTH	J	MAX	.031	.039	.048	.054	.060	.075	.084	.094
		MIN	.023	.031	.039	.045	.050	.064	.072	.081
SLOT DEPTH	T	MAX	.030	.042	.053	.065	.077	.109	.134	.163
		MIN	.024	.034	.044	.054	.064	.088	.112	.136
DEPTH OF UNDERCUT	C	MAX	.010	.012	.015	.017	.020	.026	.032	.039
		MIN	.005	.007	.010	.012	.015	.021	.027	.034

LENGTH	L	TOLERANCE	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.
THREADS SHALL EXTEND TO WITHIN 2 THREADS OF THE BEARING SURFACE OF THE HEAD, OR CLOSER IF PRACTICABLE.	1/8	+0 -1/32	1	11	24	39				
	3/16		2	12	25	40	58			
	1/4		3	13	26	41	59			
	5/16		4	14	27	42	60	76		
	3/8		5	15	28	43	61	77	92	
	7/16		6	16	29	44	62	78	93	
	1/2		7	17	30	45	63	79	94	107
	5/8		8	18	31	46	64	80	95	108
	3/4		9	19	32	47	65	81	96	109
	7/8		10	20	33	48	66	82	97	110
	1			21	34	49	67	83	98	111
	1-1/4	+0 -1/16		22	35	50	68	84	99	112
	1-1/2			23	36	51	69	85	100	113
	1-3/4				37	52	70	86	101	114
	2				38	53	71	87	102	115
MINIMUM COMPLETE THREAD LENGTH OF 1-3/4.	2-1/4	+0 -3/32				54	72	88	103	116
	2-1/2					55	73	89	104	117
	2-3/4					56	74	90	105	118
	3					57	75	91	106	119

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 19 Sep 63
CHECKED J. Ruggiu / [illegible] 23 Sept 63
APPROVAL
APPROVAL Ellen C Hall 1 Oct 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 1 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, SLOTTED HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006730
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006732 | A

REVISIONS 04617

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 04617	13Nov63	WK
A	REVISED PER TDRR 05627	1/14/64	

(M)

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY ENCLOSED AND THE PRECAUTIONARY WORDS "FRAGILE", "THIS END UP" AND "DO NOT DROP OR ROLL".

PACKAGING: WIRE SHALL BE FURNISHED IN A BARREL PACK OR ON SPOOLS. IF IN A BARREL PACK, THE BARREL DIAMETER SHALL BE 20 INCHES AND THE MINIMUM DIAMETER OF THE COIL SHALL BE 13 INCHES. IF ON SPOOLS, THE MINIMUM CORE DIAMETER OF THE SPOOL SHALL BE 12 INCHES.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) INSULATION: COLOR-PER TABLE 1.

(2) DIAMETER OF CONDUCTOR: 0.010 INCH + 0.0003, -0.0001 INCH.

(3) DIAMETER OVER INSULATION: 0.021 INCH, ± 0.0015 INCH.

(4) MATERIAL OF CONDUCTOR: SOLID, NON-MAGNETIC, HIGH STRENGTH COPPER ALLOY WITH 98 PERCENT COPPER MINIMUM, SILVER PLATED 40 MICROINCHES MINIMUM. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

(5) MINIMUM CONTINUOUS LENGTH: 500 FEET.

(6) FLAMMABILITY: INSULATION SHALL NOT SUPPORT COMBUSTION.

(7) STRIP FORCE: THE INSULATION PULL-OFF FORCE FOR A 3 INCH STRIP SHALL BE 8 OUNCES MINIMUM, 5 POUNDS MAXIMUM.

B. ELECTRICAL CHARACTERISTICS:

(1) DC RESISTANCE: 125 OHMS MAXIMUM PER 1000 FEET.

(2) VOLTAGE RATING: 600 VOLTS RMS.

(3) DIELECTRIC STRENGTH: 2500 VOLTS RMS, MINIMUM AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

(4) INSULATION RESISTANCE: 2500 MEGOHMS MINIMUM PER 1000 FEET AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

3. DESIGN:

A. OPERATING TEMPERATURE: 140°C, MAXIMUM.

B. TENSILE STRENGTH: 55,000 POUNDS PER SQUARE INCH, MINIMUM.

C. ELONGATION: 7.5 PERCENT MINIMUM.

D. SPLICES: SPLICES OF THE CONDUCTOR SHALL BE ELECTRO-WELDED BEFORE FINAL DRAWING AND SHALL BE OF THE BUTT TYPE.

E. DIELECTRIC CONSTANT: 3.3 MAXIMUM AT 60 CPS AND 77°F.

F. CONCENTRICITY: AT ANY CROSS SECTION ALONG THE LENGTH OF THE COMPLETED WIRE THE MINIMUM THICKNESS OF THE INSULATION SHALL NOT BE LESS THAN 41 PERCENT OF THE DIFFERENCE BETWEEN THE MEASURED DIAMETER OVER THE INSULATION AND THE MEASURED DIAMETER OVER THE CONDUCTOR, OR NOT LESS THAN 70 PERCENT OF THE MAXIMUM THICKNESS AT THAT CROSS-SECTION.

G. HEAT RESISTANCE: INSULATION SHALL WITHSTAND 2000 VOLTS MINIMUM AFTER 96 HOURS AT 150°C.

H. COLD BEND: INSULATION SHALL WITHSTAND 2000 VOLTS MINIMUM AFTER 4 HOURS AT -65°C AND BENT AROUND A 1/2 INCH DIAMETER MANDREL.

J. INSULATION CUT-THROUGH: AT A TEMPERATURE OF 50°C THE INSULATION SHALL RESIST THE PENETRATION OF A METAL BLADE 0.003 INCH ± 0.0002 INCH THICK WITH 750 GRAMS APPLIED AT THE POINT OF CONTACT FOR 24 HOURS. THERE SHALL BE NO ELECTRICAL CONTINUITY BETWEEN THE BLADE AND THE CONDUCTOR WHEN A POTENTIAL OF 500 VOLTS RMS IS APPLIED.

K. MINIMUM CURL OF WIRE: WHEN A 30 INCH LENGTH OF WIRE IS CUT FROM A BARREL OR SPOOL, THE WIRE, WHEN LYING UNRESTRAINED ON A SMOOTH, FLAT SURFACE, SHALL NOT CURL UP TO A DIAMETER OF LESS THAN 10 INCHES WITHIN ONE MINUTE AT AMBIENT TEMPERATURES.

L. SPARK TEST: 1000 VOLTS RMS.

TABLE 1

NASA DWG. NO.	COLOR	
1006732-1	YELLOW	
-2	RED	
-3	BLUE	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN JP A Wheeler DATE 10 Oct 63
CHECKED J. Ruggiri
APPROVAL
APPROVAL Eldon C Hall 8 Nov 63
NASA APPROVAL 11/13/63
MIT APPROVAL 13Nov63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL,
INSULATED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006732
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006732 B

REVISIONS 04617

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 04617	13Nov63	WK
A	REVISED PER TDRR 05627	1/14/64	
B	REVISED PER TDRR 07624	4/4/64	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY ENCLOSED AND THE PRECAUTIONARY WORDS "FRAGILE", "THIS END UP" AND "DO NOT DROP OR ROLL".

PACKAGING: WIRE SHALL BE FURNISHED IN A BARREL PACK, THE BARREL DIAMETER SHALL BE 20 INCHES AND THE MINIMUM DIAMETER OF THE COIL SHALL BE 13 INCHES.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) INSULATION: COLOR-PER TABLE 1

(2) DIAMETER OF CONDUCTOR: 0.010 INCH + 0.0003, -0.0001 INCH.

(3) DIAMETER OVER INSULATION: 0.021 INCH, ± 0.0015 INCH.

(4) MATERIAL OF CONDUCTOR: SOLID, NON-MAGNETIC, HIGH STRENGTH COPPER ALLOY WITH 98 PERCENT COPPER MINIMUM, SILVER PLATED 40 MICROINCHES MINIMUM. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

(5) MINIMUM CONTINUOUS LENGTH: 500 FEET.

(6) FLAMMABILITY: INSULATION SHALL NOT SUPPORT COMBUSTION.

(7) STRIP FORCE: THE INSULATION PULL-OFF FORCE FOR A 3 INCH STRIP SHALL BE 8 OUNCES MINIMUM, 5 POUNDS MAXIMUM.

B. ELECTRICAL CHARACTERISTICS:

(1) DC RESISTANCE: 125 OHMS MAXIMUM PER 1000 FEET.

(2) VOLTAGE RATING: 300 VOLTS RMS.

(3) DIELECTRIC STRENGTH: 1000 VOLTS RMS, MINIMUM AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C, SAMPLE BASIS.

(4) INSULATION RESISTANCE: 2500 MEGOHMS MINIMUM PER 1000 FEET AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

3. DESIGN:

A. OPERATING TEMPERATURE: 140°C, MAXIMUM.

B. TENSILE STRENGTH: 50,000 POUNDS PER SQUARE INCH, MINIMUM.

C. ELONGATION: 7.5 PERCENT MINIMUM.

D. SPLICES: SPLICES SHALL HAVE INSULATION STRIPPED 2" ON EACH SIDE AND THE ENDS SHALL BE TIED IN A KNOT.

E. DIELECTRIC CONSTANT: 3.3 MAXIMUM AT 60 CPS AND 77°F.

F. CONCENTRICITY: AT ANY CROSS SECTION ALONG THE LENGTH OF THE COMPLETED WIRE THE MINIMUM THICKNESS OF THE INSULATION SHALL NOT BE LESS THAN 41 PERCENT OF THE DIFFERENCE BETWEEN THE MEASURED DIAMETER OVER THE INSULATION AND THE MEASURED DIAMETER OVER THE CONDUCTOR, OR NOT LESS THAN 70 PERCENT OF THE MAXIMUM THICKNESS AT THAT CROSS-SECTION.

G. HEAT RESISTANCE: INSULATION SHALL WITHSTAND 500 VOLTS MINIMUM AFTER 96 HOURS AT 150°C.

H. COLD BEND: INSULATION SHALL WITHSTAND 500 VOLTS MINIMUM AFTER 4 HOURS AT -65°C AND BENT AROUND A 1/2 INCH DIAMETER MANDREL.

J. INSULATION CUT-THROUGH: AT A TEMPERATURE OF 50°C THE INSULATION SHALL RESIST THE PENETRATION OF A STANDARD U.L. CHISEL TESTER WITH A 90° CUTTING EDGE OF .005 INCH RADIUS, WEIGHTED WITH 400 GRAMS APPLIED AT THE POINT OF CONTACT FOR 24 HOURS. THERE SHALL BE NO ELECTRICAL CONTINUITY BETWEEN THE BLADE AND THE CONDUCTOR WHEN A POTENTIAL OF 500 VOLTS RMS IS APPLIED.

K. MINIMUM CURL OF WIRE: WHEN A 30 INCH LENGTH OF WIRE IS CUT FROM A BARREL OR SPOOL, THE WIRE, WHEN LYING UNRESTRAINED ON A SMOOTH, FLAT SURFACE, SHALL NOT CURL UP TO A DIAMETER OF LESS THAN 10 INCHES WITHIN ONE MINUTE AT AMBIENT TEMPERATURES.

L. SPARK TEST: 1500 VOLTS RMS.

M. APPROVED MATERIALS: MONOTRIFLOROETHELYNE (KEL-F MODIFIED)

TABLE 1

NASA DWG. NO.	COLOR	
1006732-1	YELLOW	
-2	RED	
-3	BLUE	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1007034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN a Wheeler DATE 10 Oct 63
CHECKED J. Ruggiri
APPROVAL
APPROVAL Eldon C Hall 8 Nov 63
NASA APPROVAL 11/13/63
MIT APPROVAL 13 Nov 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL, INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006732
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006732 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 04617

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 04617	13Nov63	WK
A	REVISED PER TDRR 05627	1/14/64	
B	REVISED PER TDRR 07624	4/1/64	
C	REVISED PER TDRR 24794	22Dec65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY ENCLOSED AND THE PRECAUTIONARY WORDS "FRAGILE", "THIS END UP" AND "DO NOT DROP OR ROLL".

PACKAGING: WIRE SHALL BE FURNISHED IN A BARREL PACK, THE BARREL DIAMETER SHALL BE 20 INCHES AND THE MINIMUM DIAMETER OF THE COIL SHALL BE 13 INCHES.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) INSULATION: COLOR-PER TABLE 1

(2) DIAMETER OF CONDUCTOR: 0.010 INCH + 0.0003, -0.0001 INCH.

(3) DIAMETER OVER INSULATION: 0.021 INCH, ± 0.0015 INCH.

(4) MATERIAL OF CONDUCTOR: SOLID, NON-MAGNETIC, HIGH STRENGTH COPPER ALLOY WITH 98 PERCENT COPPER MINIMUM, SILVER PLATED 40 MICROINCHES MINIMUM. TO 80 MICROINCHES MAXIMUM. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

(5) MINIMUM CONTINUOUS LENGTH: 500 FEET.

(6) FLAMMABILITY: INSULATION SHALL NOT SUPPORT COMBUSTION.

(7) STRIP FORCE: THE INSULATION PULL-OFF FORCE FOR A 3 INCH STRIP SHALL BE 8 OUNCES MINIMUM, 5 POUNDS MAXIMUM.

B. ELECTRICAL CHARACTERISTICS:

(1) DC RESISTANCE: 125 OHMS MAXIMUM PER 1000 FEET.

(2) VOLTAGE RATING: 300 VOLTS RMS.

(3) DIELECTRIC STRENGTH: 1000 VOLTS RMS, MINIMUM AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C, SAMPLE BASIS.

(4) INSULATION RESISTANCE: 2500 MEGOHMS MINIMUM PER 1000 FEET AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

3. DESIGN:

A. OPERATING TEMPERATURE: 140°C, MAXIMUM.

B. TENSILE STRENGTH: 50,000 POUNDS PER SQUARE INCH, MINIMUM. TO 70,000 POUNDS PER SQUARE INCH MAXIMUM.

C. ELONGATION: 7.5 PERCENT MINIMUM.

D. SPLICES: SPLICES SHALL HAVE INSULATION STRIPPED 2" ON EACH SIDE AND THE ENDS SHALL BE TIED IN A KNOT.

E. DIELECTRIC CONSTANT: 3.3 MAXIMUM AT 60 CPS AND 77°F.

F. CONCENTRICITY: AT ANY CROSS SECTION ALONG THE LENGTH OF THE COMPLETED WIRE THE MINIMUM THICKNESS OF THE INSULATION SHALL NOT BE LESS THAN 41 PERCENT OF THE DIFFERENCE BETWEEN THE MEASURED DIAMETER OVER THE INSULATION AND THE MEASURED DIAMETER OVER THE CONDUCTOR, OR NOT LESS THAN 70 PERCENT OF THE MAXIMUM THICKNESS AT THAT CROSS-SECTION.

G. HEAT RESISTANCE: INSULATION SHALL WITHSTAND 500 VOLTS MINIMUM AFTER 96 HOURS AT 150°C.

H. COLD BEND: INSULATION SHALL WITHSTAND 500 VOLTS MINIMUM AFTER 4 HOURS AT -65°C AND BENT AROUND A 1/2 INCH DIAMETER MANDREL.

J. INSULATION CUT-THROUGH: AT A TEMPERATURE OF 50°C THE INSULATION SHALL RESIST THE PENETRATION OF A STANDARD U.L. CHISEL TESTER WITH A 90° CUTTING EDGE OF .005 INCH RADIUS, WEIGHTED WITH 400 GRAMS APPLIED AT THE POINT OF CONTACT FOR 24 HOURS. THERE SHALL BE NO ELECTRICAL CONTINUITY BETWEEN THE BLADE AND THE CONDUCTOR WHEN A POTENTIAL OF 500 VOLTS RMS IS APPLIED.

K. MINIMUM CURL OF WIRE: WHEN A 30 INCH LENGTH OF WIRE IS CUT FROM A BARREL OR SPOOL, THE WIRE, WHEN LYING UNRESTRAINED ON A SMOOTH, FLAT SURFACE, SHALL NOT CURL UP TO A DIAMETER OF LESS THAN 10 INCHES WITHIN ONE MINUTE AT AMBIENT TEMPERATURES.

L. SPARK TEST: 1500 VOLTS RMS.

M. APPROVED MATERIALS: MONOTRIFLOROETHELYNE (KEL-F MODIFIED)

TABLE 1

NASA DWG. NO.	COLOR	
1006732-1	YELLOW	
-2	RED	
-3	BLUE	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN JP G Wheeler DATE 10 Oct 63
CHECKED J. Ruggiero
APPROVAL
APPROVAL Eldon C Hall 8 Nov 63
NASA APPROVAL 11/13/63
MIT APPROVAL 13Nov63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL,
INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006732
SCALE NONE
WT
SHEET 1 OF 1

1006732 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006732 | D

REVISIONS 04617

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 04617	13 Nov 63	WK
Ⓜ A	REVISED PER TDRR 05627	1/14/64	
Ⓜ B	REVISED PER TDRR 07624		
Ⓜ C	REVISED PER TDRR 24794	22 Dec 65	WK
D	REVISED PER TDRR 27682	3/31/66	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY ENCLOSED AND THE PRECAUTIONARY WORDS "FRAGILE", "THIS END UP" AND "DO NOT DROP OR ROLL".

     PACKAGING: WIRE SHALL BE FURNISHED IN A BARREL PACK, THE BARREL DIAMETER SHALL BE 20 INCHES AND THE MINIMUM DIAMETER OF THE COIL SHALL BE 13 INCHES.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - (1) INSULATION: COLOR-PER TABLE 1
     - (2) DIAMETER OF CONDUCTOR: 0.010 INCH + 0.0003, -0.0001 INCH.
     - (3) DIAMETER OVER INSULATION: 0.021 INCH, ± 0.0015 INCH.
     - (4) MATERIAL OF CONDUCTOR: SOLID, NON-MAGNETIC, HIGH STRENGTH COPPER ALLOY WITH 98 PERCENT COPPER MINIMUM, SILVER PLATED 40 MICROINCHES MINIMUM. TO 80 MICROINCHES MAXIMUM. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.
     - (5) MINIMUM CONTINUOUS LENGTH: 500 FEET.
     - (6) FLAMMABILITY: INSULATION SHALL NOT SUPPORT COMBUSTION.
     - (7) STRIP FORCE: THE INSULATION PULL-OFF FORCE FOR A 3 INCH STRIP SHALL BE 8 OUNCES MINIMUM, 5 POUNDS MAXIMUM.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) DC RESISTANCE: 125 OHMS MAXIMUM PER 1000 FEET.
     - (2) VOLTAGE RATING: 300 VOLTS RMS.
     - (3) DIELECTRIC STRENGTH: 1000 VOLTS RMS, MINIMUM AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C, SAMPLE BASIS.
     - (4) INSULATION RESISTANCE: 2500 MEGOHMS MINIMUM PER 1000 FEET AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

3. DESIGN:
   - A. OPERATING TEMPERATURE: 140°C, MAXIMUM.
   - B. TENSILE STRENGTH: 50,000 POUNDS PER SQUARE INCH, MINIMUM. TO 70,000 POUNDS PER SQUARE INCH MAXIMUM.
   - C. ELONGATION: 7.5 PERCENT MINIMUM.
   - D. SPLICES: SPLICES SHALL HAVE INSULATION STRIPPED 2" ON EACH SIDE AND THE ENDS SHALL BE TIED IN A KNOT.
   - E. DIELECTRIC CONSTANT: 3.3 MAXIMUM AT 60 CPS AND 77°F.
   - F. CONCENTRICITY: AT ANY CROSS SECTION ALONG THE LENGTH OF THE COMPLETED WIRE THE MINIMUM THICKNESS OF THE INSULATION SHALL NOT BE LESS THAN 41 PERCENT OF THE DIFFERENCE BETWEEN THE MEASURED DIAMETER OVER THE INSULATION AND THE MEASURED DIAMETER OVER THE CONDUCTOR, OR NOT LESS THAN 70 PERCENT OF THE MAXIMUM THICKNESS AT THAT CROSS-SECTION.
   - G. HEAT RESISTANCE: INSULATION SHALL WITHSTAND 500 VOLTS MINIMUM AFTER 96 HOURS AT 150°C.
   - H. COLD BEND: INSULATION SHALL WITHSTAND 500 VOLTS MINIMUM AFTER 4 HOURS AT -65°C AND BENT AROUND A 1/2 INCH DIAMETER MANDREL.
   - J. INSULATION CUT-THROUGH: AT A TEMPERATURE OF 50°C THE INSULATION SHALL RESIST THE PENETRATION OF A STANDARD U.L. CHISEL TESTER WITH A 90° CUTTING EDGE OF .005 INCH RADIUS, WEIGHTED WITH 300 GRAMS APPLIED AT THE POINT OF CONTACT FOR 24 HOURS. THERE SHALL BE NO ELECTRICAL CONTINUITY BETWEEN THE BLADE AND THE CONDUCTOR WHEN A POTENTIAL OF 500 VOLTS RMS IS APPLIED.
   - K. MINIMUM CURL OF WIRE: WHEN A 30 INCH LENGTH OF WIRE IS CUT FROM A BARREL OR SPOOL, THE WIRE, WHEN LYING UNRESTRAINED ON A SMOOTH, FLAT SURFACE, SHALL NOT CURL UP TO A DIAMETER OF LESS THAN 10 INCHES WITHIN ONE MINUTE AT AMBIENT TEMPERATURES.
   - L. SPARK TEST: 1500 VOLTS RMS.
   - M. APPROVED MATERIALS: MONOTRIFLOROETHELYNE (KEL-F MODIFIED)

TABLE 1

NASA DWG. NO.	COLOR	
1006732-1	YELLOW	
-2	RED	
-3	BLUE	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN P. A. Wheeler DATE 10 Oct 63
CHECKED J. Riggin
APPROVAL
APPROVAL Eldon C Hall 8 Nov 63

NASA APPROVAL 11/13/63

MIT APPROVAL 13 Nov 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL,
INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — | SIZE C | NASA DRAWING NO. 1006732

SCALE NONE | WT | SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006732

	REVISIONS 04617		
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 04617	13 Nov 63	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND QUANTITY ENCLOSED AND THE PRECAUTIONARY WORDS "FRAGILE", "THIS END UP" AND "DO NOT DROP OR ROLL".

PACKAGING: WIRE SHALL BE FURNISHED IN A BARREL PACK OR ON SPOOLS. IF IN A BARREL PACK, THE BARREL DIAMETER SHALL BE 20 INCHES AND THE MINIMUM DIAMETER OF THE COIL SHALL BE 13 INCHES. IF ON SPOOLS, THE MINIMUM CORE DIAMETER OF THE SPOOL SHALL BE 12 INCHES.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) INSULATION MATERIAL: TEFLON: COLOR-YELLOW.

(2) DIAMETER OF CONDUCTOR: 0.010 INCH + 0.0003, -0.0001 INCH.

(3) DIAMETER OVER INSULATION: 0.021 INCH, ± 0.0015 INCH.

(4) MATERIAL OF CONDUCTOR: SOLID, NON-MAGNETIC, HIGH STRENGTH COPPER ALLOY WITH 98 PERCENT COPPER MINIMUM, SILVER PLATED 40 MICROINCHES MINIMUM. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

(5) MINIMUM CONTINUOUS LENGTH: 500 FEET.

(6) FLAMMABILITY: INSULATION SHALL NOT SUPPORT COMBUSTION.

(7) STRIP FORCE: THE INSULATION PULL-OFF FORCE FOR A 3 INCH STRIP SHALL BE 8 OUNCES MINIMUM, 5 POUNDS MAXIMUM.

B. ELECTRICAL CHARACTERISTICS:

(1) DC RESISTANCE: 125 OHMS MAXIMUM PER 1000 FEET.

(2) VOLTAGE RATING: 600 VOLTS RMS.

(3) DIELECTRIC STRENGTH: 2500 VOLTS RMS, MINIMUM AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

(4) INSULATION RESISTANCE: 2500 MEGOHMS MINIMUM PER 1000 FEET AFTER 4 HOURS IN WATER 25°C PLUS OR MINUS 5°C.

3. DESIGN:

A. OPERATING TEMPERATURE: 140°C, MAXIMUM.

B. TENSILE STRENGTH: 55,000 POUNDS PER SQUARE INCH, MINIMUM.

C. ELONGATION: 7.5 PERCENT MINIMUM.

D. SPLICES: SPLICES OF THE CONDUCTOR SHALL BE ELECTRO-WELDED BEFORE FINAL DRAWING AND SHALL BE OF THE BUTT TYPE.

E. DIELECTRIC CONSTANT: 2.5 MAXIMUM AT 60 CPS AND 77°F.

F. CONCENTRICITY: AT ANY CROSS SECTION ALONG THE LENGTH OF THE COMPLETED WIRE THE MINIMUM THICKNESS OF THE INSULATION SHALL NOT BE LESS THAN 41 PERCENT OF THE DIFFERENCE BETWEEN THE MEASURED DIAMETER OVER THE INSULATION AND THE MEASURED DIAMETER OVER THE CONDUCTOR, OR NOT LESS THAN 70 PERCENT OF THE MAXIMUM THICKNESS AT THAT CROSS-SECTION.

G. HEAT RESISTANCE: INSULATION SHALL WITHSTAND 2000 VOLTS MINIMUM AFTER 96 HOURS AT 150°C.

H. COLD BEND: INSULATION SHALL WITHSTAND 2000 VOLTS MINIMUM AFTER 4 HOURS AT -65°C AND BENT AROUND A 1/2 INCH DIAMETER MANDREL.

J. INSULATION CUT-THROUGH: AT A TEMPERATURE OF 50°C THE INSULATION SHALL RESIST THE PENETRATION OF A METAL BLADE 0.003 INCH ± 0.002 INCH THICK WITH 750 GRAMS APPLIED AT THE POINT OF CONTACT FOR 24 HOURS. THERE SHALL BE NO ELECTRICAL CONTINUITY BETWEEN THE BLADE AND THE CONDUCTOR WHEN A POTENTIAL OF 500 VOLTS RMS IS APPLIED.

K. MINIMUM CURL OF WIRE: WHEN A 30 INCH LENGTH OF WIRE IS CUT FROM A BARREL OR SPOOL, THE WIRE, WHEN LYING UNRESTRAINED ON A SMOOTH, FLAT SURFACE, SHALL NOT CURL UP TO A DIAMETER OF LESS THAN 10 INCHES WITHIN ONE MINUTE AT AMBIENT TEMPERATURES.

L. SPARK TEST: 1000 VOLTS RMS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN G Wheeler DATE 10 Oct 63
CHECKED J. Ruggio
APPROVAL
APPROVAL Eldon C Hall 8 Nov 63
NASA APPROVAL 11/13/63
MIT APPROVAL 13 Nov 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL,
INSULATED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006732
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

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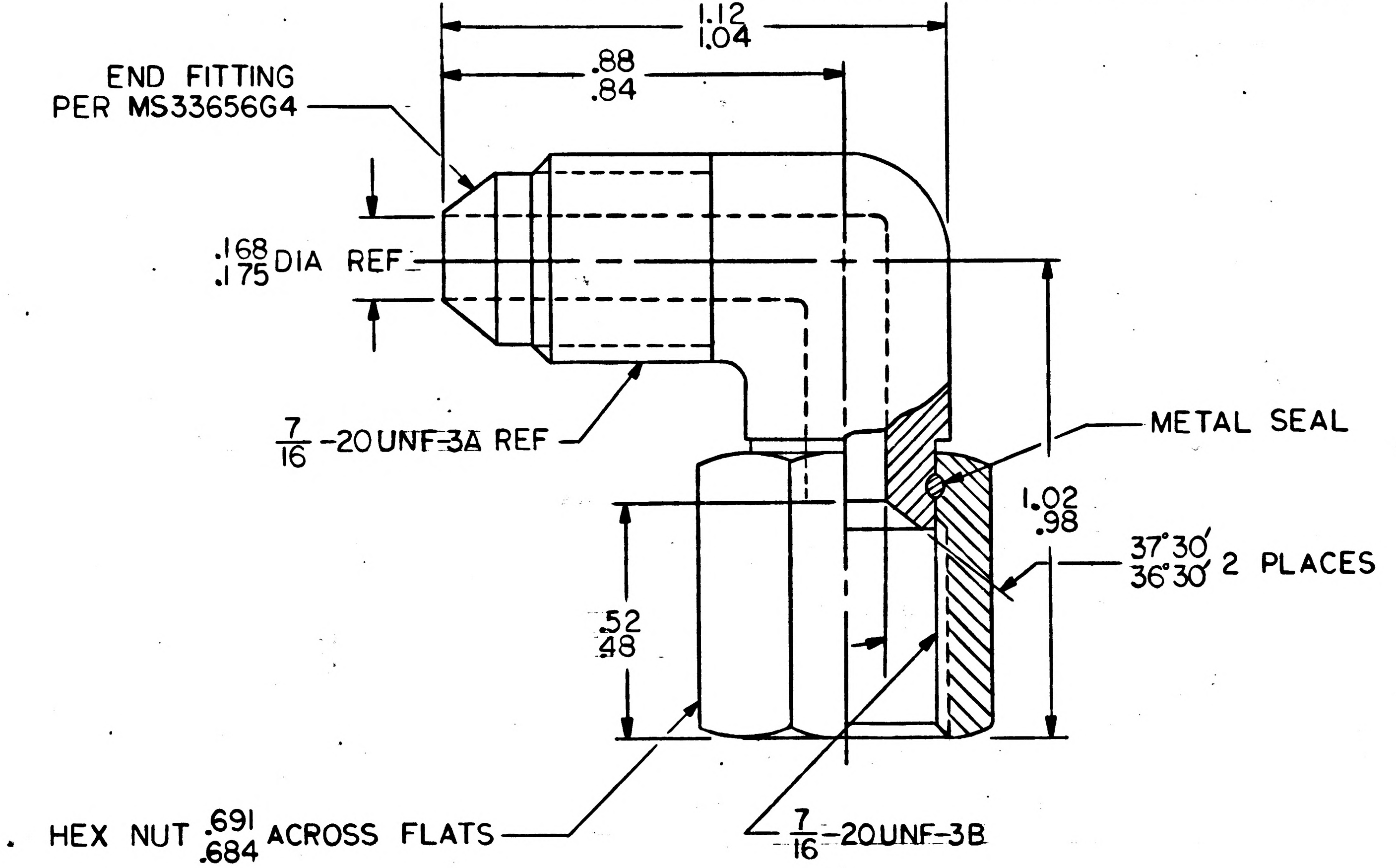
NOTES:

1. GENERAL REQUIREMENTS:
    - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
    - B. MARKING: PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE NUMBER, PART NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%):
    - A. MECHANICAL REQUIREMENTS:
        - (1) DIMENSIONS: SEE SKETCH.
        - (2) CERTIFICATION: COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN REQUIREMENTS:
    - A. MATERIAL: 300 SERIES CORROSION RESISTING STEEL PER QQ-S-763.
    - B. FINISH: PASSIVATED PER MIL-S-5002.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 04306 DATE 10/30/63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Matty DATE 7 OCT 63
CHECKED J. Ruggeri H. Maynard 15 Oct. 63
APPROVAL R J Blanchey JPK
APPROVAL
APPROVAL 10/21/63
NASA APPROVAL
MIT APPROVAL W Kupfer 30 Oct 63
MIT APPROVAL D. Scolamiero 10/29/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ELBOW, SWIVEL NUT,
1/4 FLARED TUBE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006734
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006736

REVISIONS 04617			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 04617	13 Nov 63	GH.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL CONFORM TO THE APPLICABLE GENERAL REQUIREMENTS OF MIL-R-27208A AND MIL-R-19A WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED BELOW.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002049.

   E. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER IF APPLICABLE). PACKAGES SHALL BE MARKED PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE OR DATE CODE, RESISTANCE VALUE AND POWER RATING, PLUS THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)

   A. MECHANICAL REQUIREMENTS:
      (1) SHAFT TORQUE (OPERATING): BETWEEN 3 AND 10 OUNCE-INCHES.
      (2) STOP TORQUE: 2 POUND-INCHES MINIMUM.
      (3) MECHANICAL TRAVEL: 300° ± 5°.

   B. ELECTRICAL CHARACTERISTICS (AT 25°C AND 50% RH)
      (1) RESISTANCE VALUE AND TOLERANCE: 10 K ± 5%.
      (2) ELECTRICAL TRAVEL: 300° ± 5° WITH 2% MAXIMUM END RESISTANCE.
      (3) DIELECTRIC WITHSTANDING VOLTAGE: 900 VRMS AT SEA LEVEL AND 450 VRMS AT 50,000 FEET (3.4 INCHES MERCURY).
      (4) INSULATION RESISTANCE: 1000 MEGOHMS AT 100 ± 10 VRMS.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM AT .30 WATT DISSIPATION AND +125°C.

   B. STORAGE LIFE: 1 YEAR MINIMUM AT STANDARD ROOM TEMPERATURE AND HUMIDITY.

   C. CONSTRUCTION: UNITS SHALL BE HERMETICALLY SEALED, IMMERSION PROOF PER MIL-R-27208, AND EXPLOSION PROOF PER MIL-STD-202 METHOD 109.
      (1) MATERIAL: CASE AND SHAFT, NICKEL-PLATED BRASS. TERMINALS, GOLD-FLASHED BRASS.
      (2) HARDWARE: MOUNTING NUT AND LOCKWASHER FURNISHED.

   D. RATING: 2 WATT AT +85°C DERATED LINEARLY TO ZERO AT +150°C.

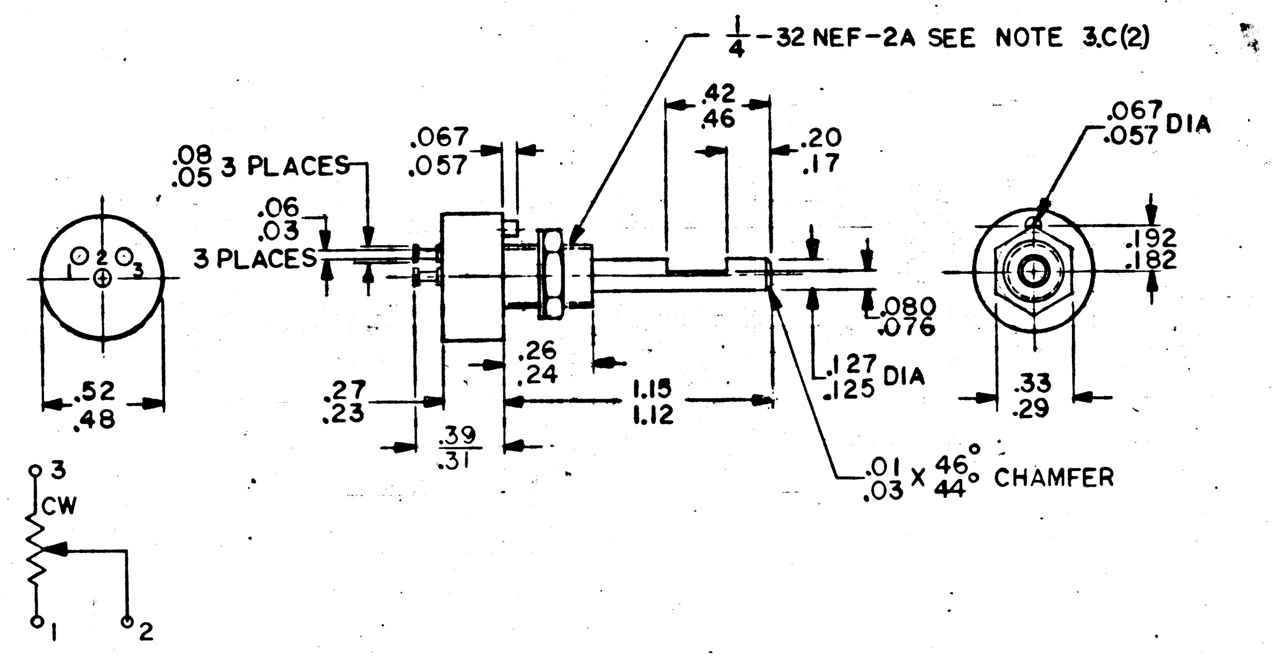
   E. INDEPENDENT LINEARITY: ± 3%.

4. SPECIAL CONDITIONING:

   A. TEMPERATURE CYCLING (NON-OPERATING): UNITS SHALL BE TEMPERATURE CYCLED A TOTAL OF THREE (3) CYCLES. EACH CYCLE SHALL CONSIST OF INCREASING THE TEMPERATURE FROM 25°C TO 125°C, THEN DECREASING TO -55°C, THEN RETURNING TO 25°C. READINGS TO BE TAKEN AT ALL TEMPERATURE EXTREMES. A RESISTANCE CHANGE GREATER THAN 2.0% FROM THE ORIGINAL READING SHALL BE CONSIDERED A FAILURE. CYCLING SHOULD BE DONE IN ACCORDANCE WITH MIL-STD-202, METHOD 102.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER



SCHEMATIC

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
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HEAT TREATMENT
FINAL FINISH SEE NOTES

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Carifano DATE 31 OCT 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL Eldon C Hall 13 Nov 63
NASA APPROVAL K Mikulak 11/13/63
MIT APPROVAL W Kupfer 13 Nov 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR,
VARIABLE, WW

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006736
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006738 A

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 05/97	12/17/63	
A	REVISED PER TDRR 12803	9/29/64	

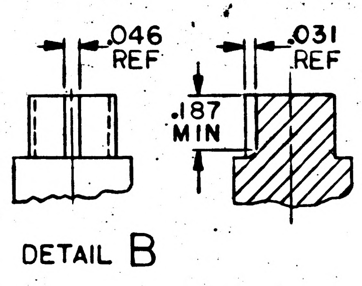
Ⓜ

REQUIREMENTS:

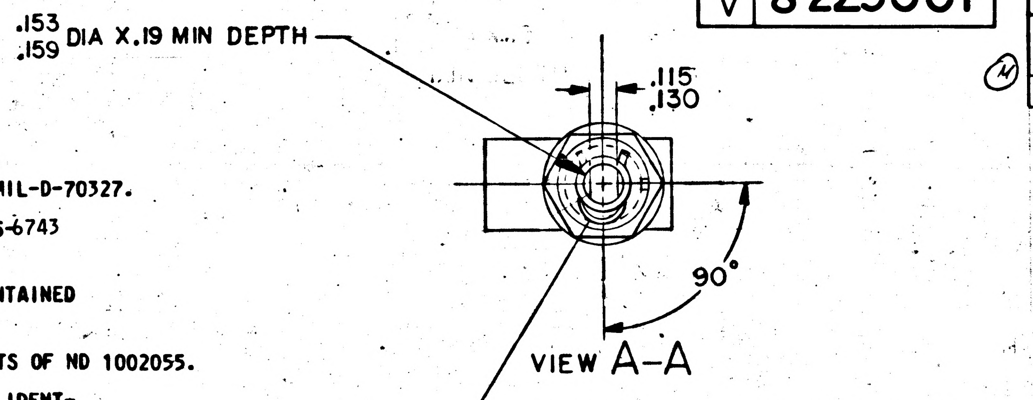
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-6743 EXCEPT AS AND IN ADDITION TO REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNIT SHALL BE MARKED PER ND 1002019 , WITH TERMINAL IDENTIFICATION AND NASA PART NUMBER. (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, PART NUMBER AND NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: SHALL BE 52 ALLOY, GOLD PLATED. CERTIFICATE OF MATERIAL COMPLIANCE FROM THE SUPPLIER SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: SINGLE POLE DOUBLE THROW.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS, 60 CYCLES.
   - D. ACTUATING FORCE: 12 TO 18 OUNCES.
   - E. MARKING: PER PARAGRAPH 1.E.
   - F. PRETRAVEL: 1/8 ± 1/32.
   - G. TOTAL TRAVEL: .240 MIN.
3. DESIGN:
   - A. OPERATING TEMPERATURE RANGE: -80°F TO +250°F.
   - B. CONTACT RATINGS:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (3) INRUSH CURRENT ~~[illegible] AMPERES~~ PER MOTOR LOAD REQUIREMENT OF MIL-S-6743
   - C. MINIMUM OPERATING CYCLES: 25,000.
   - D. STRENGTH OF ACTUATOR: 25 POUND AXIAL COMPRESSIVE FORCE.
   - E. STRENGTH OF TERMINALS: 5 POUND AXIAL TENSILE FORCE.
   - F. CONTACT VOLTAGE DROP: 100 MILLIVOLTS MAXIMUM WHEN 1 AMPERE IS APPLIED THROUGH CONTACTS, AFTER COMPLETION OF RUN-IN PER PARAGRAPH 4.A.
   - G. SEAL LEAK RATE: SHALL BE HERMETICALLY SEALED. LEAK RATE NOT MORE THAN 10^{-6} ATM/CC/MIN.
   - H. CONTACT BOUNCE: NOT MORE THAN 2.0 MILLISECONDS TOTAL; INDIVIDUAL BOUNCES NOT MORE THAN 0.6 MILLISECONDS THERE SHALL BE NO BOUNCE LARGE ENOUGH TO CAUSE MOVABLE CONTACT TO CLOSE WITH NC CONTACT.
   - J. UNITS SHALL MEET THE SHOCK, VIBRATION, AND EXPLOSION-PROOF REQUIREMENTS OF ND 1002055.
4. SPECIAL CONDITIONING: (BY SUPPLIER)
   - A. RUN-IN: UNITS SHALL BE OPERATED FOR 1000 CYCLES WITH A CONTACT CURRENT OF 1 AMPERE AND AN OPEN CIRCUIT VOLTAGE OF 28 VDC.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

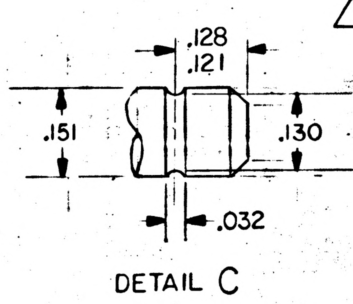


DETAIL B

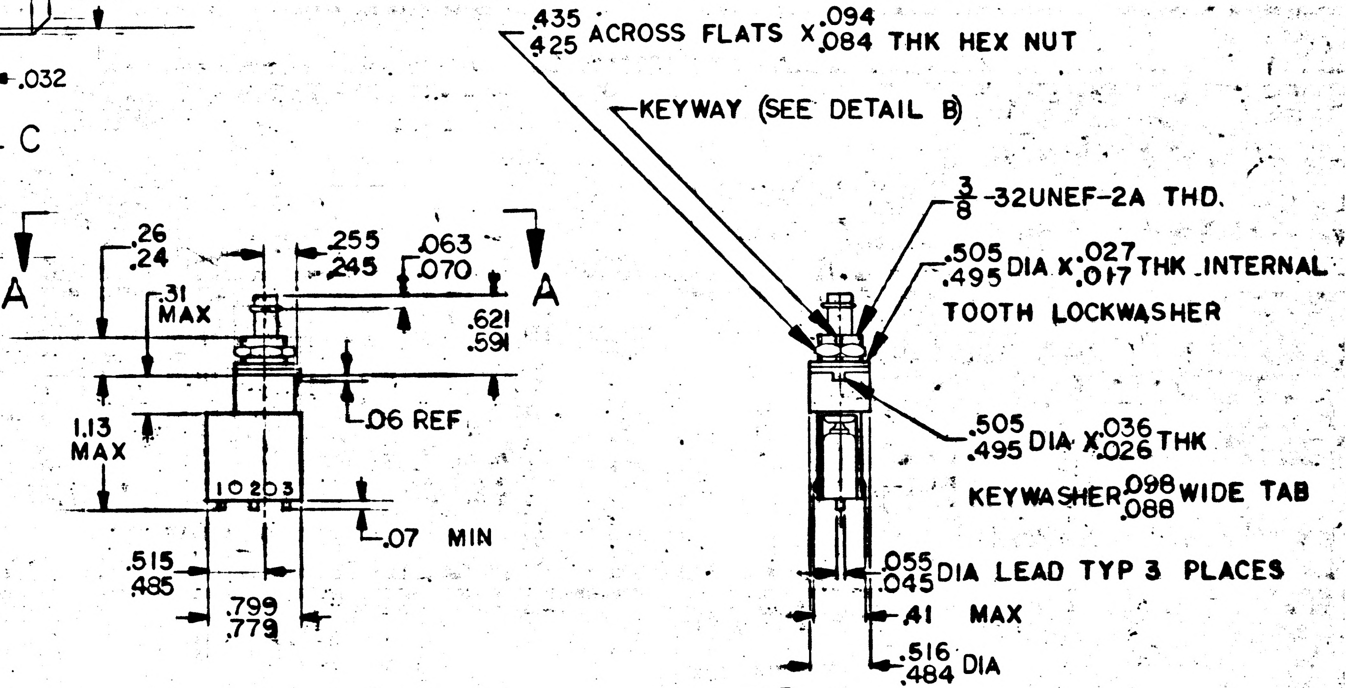


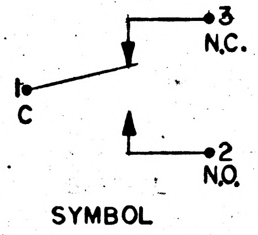
VIEW A-A

INSERT RETAINING SPRING CLIP .032 NOM THK TO RETAIN SHAFT AS SHOWN IN DETAIL C AGAINST PULL OUT FORCE OF 7 LB MIN

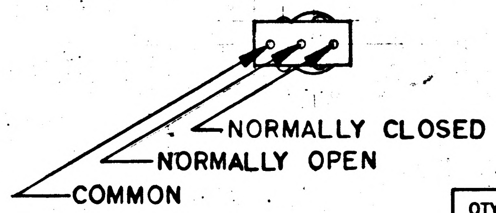


DETAIL C


A
A
.26 .24
.255 .245
.063 .070
.31 MAX
.621 .591
.06 REF
1.13 MAX
10203
.07 MIN
.515 .485
.799 .779
.435 .425 ACROSS FLATS X .094 .084 THK HEX NUT
KEYWAY (SEE DETAIL B)
3/8-32UNEF-2A THD.
.505 .495 DIA X .027 .017 THK INTERNAL TOOTH LOCKWASHER
.505 .495 DIA X .036 .026 THK KEYWASHER .098 .088 WIDE TAB
.055 .045 DIA LEAD TYP 3 PLACES
.41 MAX
.516 .484 DIA



SYMBOL



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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HEAT TREATMENT
FINAL FINISH SEE NOTES

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J. Orifice DATE 19 NOV 63
CHECKED J. Ruggen 19 Nov 63
APPROVAL
APPROVAL Eldon C Hall 16 Dec 63
NASA APPROVAL 12/17/63
MIT APPROVAL 12/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH
HERMETIC SEAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006738
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006738 B

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			
—	INITIAL RELEASE CLASS A PER TDRR 05197	12/17/63	
A	REVISED PER TDRR 12803	9/29/64	
B	REVISED PER TDRR 14740	12/15/64	

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REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-6743 EXCEPT AS AND IN ADDITION TO REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNIT SHALL BE MARKED PER ND 1002019 , WITH TERMINAL IDENTIFICATION AND NASA PART NUMBER. (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, PART NUMBER AND NASA PART NUMBER.

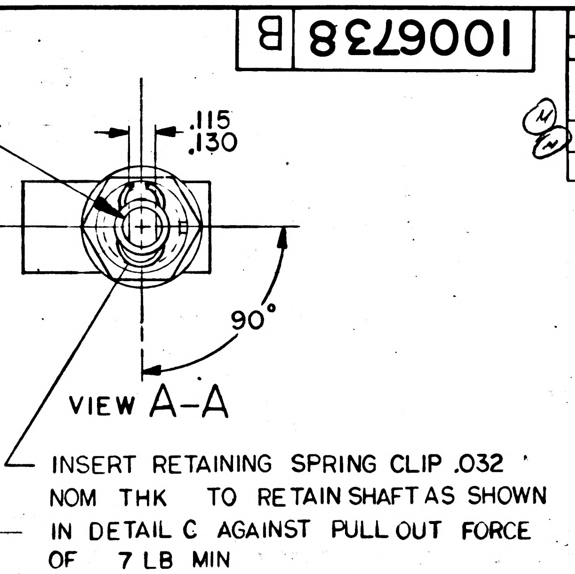
2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: SHALL BE 52 ALLOY, GOLD PLATED. CERTIFICATE OF MATERIAL COMPLIANCE FROM THE SUPPLIER SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: SINGLE POLE DOUBLE THROW.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS, 60 CYCLES.
   - D. ACTUATING FORCE: 12 TO 18 OUNCES.
   - E. MARKING: PER PARAGRAPH 1.E.
   - F. PRETRAVEL: 1/8 ± 1/32.
   - G. TOTAL TRAVEL: .240 MIN.
   - H. TOTAL ACTUAL TRAVEL SHALL BE LIMITED ONLY BECAUSE OF RETAINING SPRING CLIP INTERFERENCE AGAINST BUSHING SHOULDER. ANY UNIT WHOSE TOTAL TRAVEL DOES NOT SEAT SPRING CLIP AGAINST BUSHING SHALL BE REJECTED.

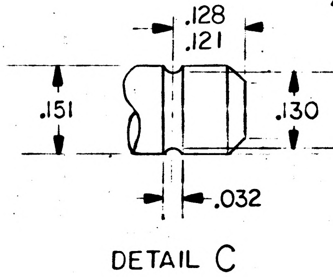
. DESIGN:
   - A. OPERATING TEMPERATURE RANGE: -80°F TO +250°F.
   - B. CONTACT RATINGS:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (3) INRUSH CURRENT ~~AMPERES~~ PER MOTOR LOAD REQUIREMENT OF MIL-S-6743
   - C. MINIMUM OPERATING CYCLES: 25,000.
   - D. STRENGTH OF ACTUATOR: 25 POUND AXIAL COMPRESSIVE FORCE.
   - E. STRENGTH OF TERMINALS: 5 POUND AXIAL TENSILE FORCE.
   - F. CONTACT VOLTAGE DROP: 100 MILLIVOLTS MAXIMUM WHEN 1 AMPERE IS APPLIED THROUGH CONTACTS, AFTER COMPLETION OF RUN-IN PER PARAGRAPH 4.A.
   - G. SEAL LEAK RATE: SHALL BE HERMETICALLY SEALED. LEAK RATE NOT MORE THAN 10^{-6} ATM/CC/MIN.
   - H. CONTACT BOUNCE: NOT MORE THAN 2.0 MILLISECONDS TOTAL; INDIVIDUAL BOUNCES NOT MORE THAN 0.6 MILLISECONDS THERE SHALL BE NO BOUNCE LARGE ENOUGH TO CAUSE MOVABLE CONTACT TO CLOSE WITH NC CONTACT.
   - J. UNITS SHALL MEET THE SHOCK, VIBRATION, AND EXPLOSION-PROOF REQUIREMENTS OF ND 1002055.

. SPECIAL CONDITIONING: (BY SUPPLIER)
   - A. RUN-IN: UNITS SHALL BE OPERATED FOR 1000 CYCLES WITH A CONTACT CURRENT OF 1 AMPERE AND AN OPEN CIRCUIT VOLTAGE OF 28 VDC.

VENDOR SUPPLIED DATA:
- A. CERTIFICATE OF ANALYSIS FOR LEAD MATERIAL
- B. CERTIFICATE OF COMPLIANCE TO ND1015404, CLASS 2
- C. BEFORE AND AFTER RUN-IN READING FOR
  - (1.) CONTACT RESISTANCE
  - (2.) PRETRAVEL
  - (3) TOTAL TRAVEL
  - (4) ACTUATING FORCE

MASTER


.153
.159 DIA X .19 MIN DEPTH
.115
.130
90°
VIEW A-A
INSERT RETAINING SPRING CLIP .032 NOM THK TO RETAIN SHAFT AS SHOWN IN DETAIL C AGAINST PULL OUT FORCE OF 7 LB MIN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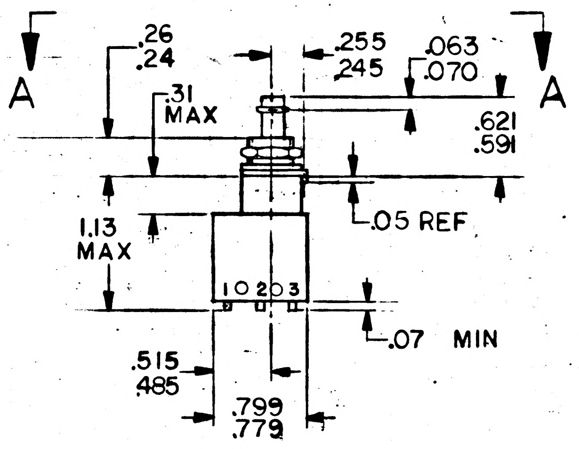
DETAIL C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.05 REF
1.13 MAX
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.07 MIN
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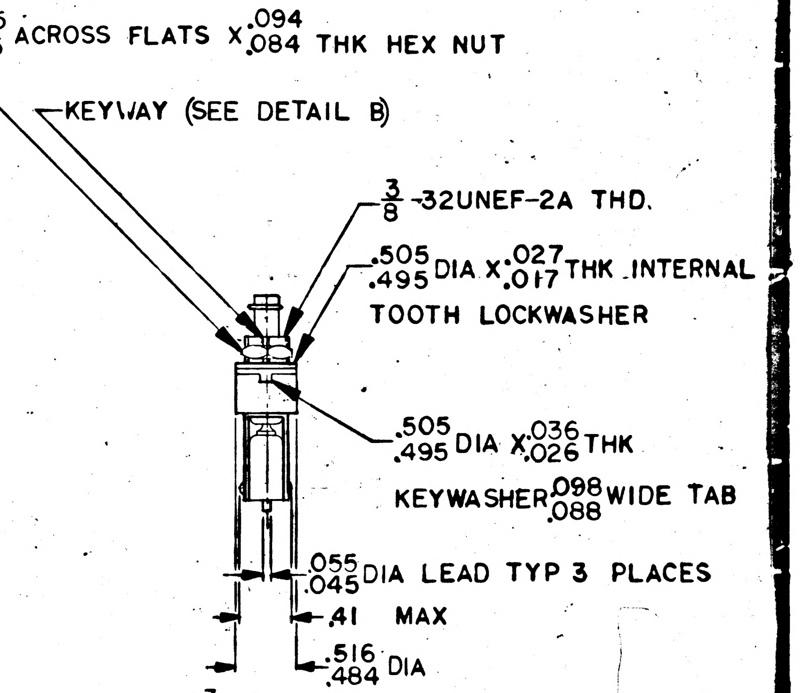
.485
.799
.779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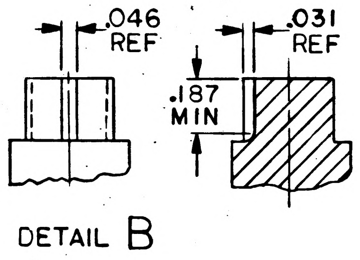
.084 THK HEX NUT
KEYWAY (SEE DETAIL B)
3/8-32UNEF-2A THD.
.505
.495 DIA X .027
.017 THK INTERNAL TOOTH LOCKWASHER
.505
.495 DIA X .036
.026 THK KEYWASHER .098
.088 WIDE TAB
.055
.045 DIA LEAD TYP 3 PLACES
.41 MAX
.516
.484 DIA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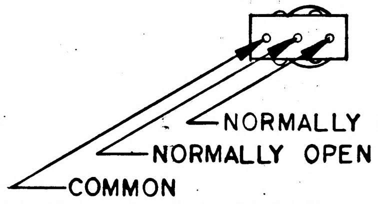
.187 MIN
DETAIL B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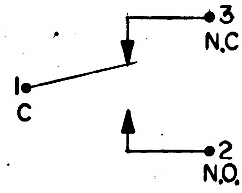
NORMALLY OPEN
COMMON



SYMBOL

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 19 NOV 63
CHECKED J. Ruggeri 19 Nov 63
APPROVAL
APPROVAL Eldon C Hall 16 Dec 63
NASA APPROVAL 12/17/63
MIT APPROVAL 12/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH
HERMETIC SEAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006738
SCALE NONE	WT	SHEET 1 OF 1

1006738

SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 05/97	12/17/63	

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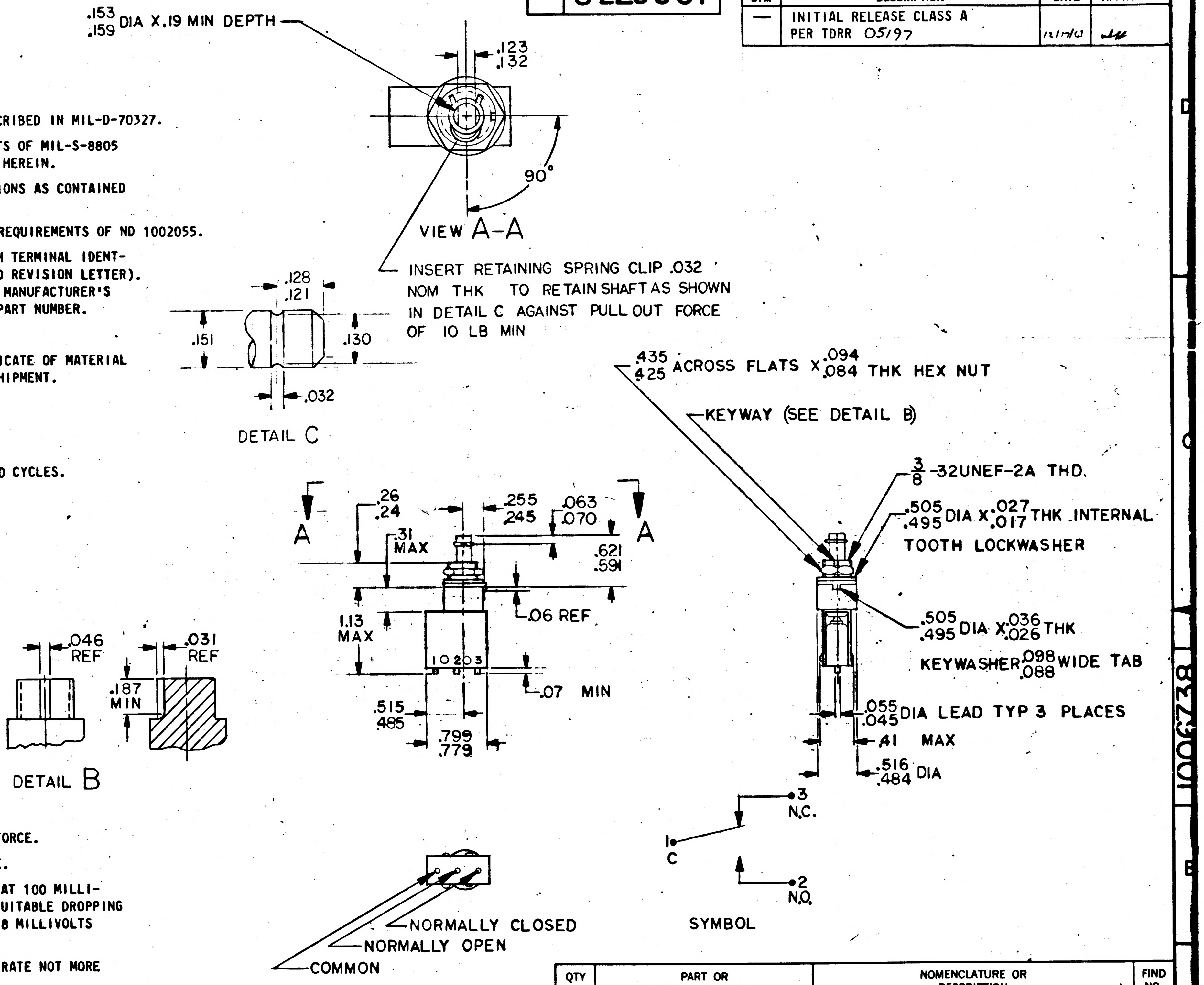
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-8805 EXCEPT AS AND IN ADDITION TO REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNIT SHALL BE MARKED PER MIL-STD-130, WITH TERMINAL IDENTIFICATION AND NASA PART NUMBER. (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, PART NUMBER AND NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: SHALL BE 52 ALLOY, GOLD PLATED. CERTIFICATE OF MATERIAL COMPLIANCE FROM THE SUPPLIER SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: SINGLE POLE DOUBLE THROW.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS, 60 CYCLES.
   - D. ACTUATING FORCE: 12 TO 18 OUNCES.
   - E. MARKING: PER PARAGRAPH 1.E.
   - F. PRETRAVEL: 1/8 ± 1/32.
   - G. TOTAL TRAVEL: .240 MIN.
3. DESIGN:
   - A. OPERATING TEMPERATURE RANGE: -90°F TO +250°F.
   - B. CONTACT RATINGS:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (3) INRUSH CURRENT: 6 TIMES RATED CURRENT.
   - C. MINIMUM OPERATING CYCLES: 25,000.
   - D. STRENGTH OF ACTUATOR: 25 POUND AXIAL COMPRESSIVE FORCE.
   - E. STRENGTH OF TERMINALS: 5 POUND AXIAL TENSILE FORCE.
   - F. CONTACT VOLTAGE DROP: FOUR (4) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR BEFORE RUN-IN; 6 MILLIVOLTS AFTER RUN-IN; 8 MILLIVOLTS AFTER LIFE TEST.
   - G. SEAL LEAK RATE: SHALL BE HERMETICALLY SEALED. LEAK RATE NOT MORE THAN 10^{-6} ATM/CC/MIN.
   - H. CONTACT BOUNCE: NOT MORE THAN 750 MICROSECONDS TOTAL; INDIVIDUAL BOUNCES NOT MORE THAN 100 MICROSECONDS. THERE SHALL BE NO BOUNCE LARGE ENOUGH TO CAUSE MOVABLE CONTACT TO CLOSE WITH NC CONTACT.
   - J. UNITS SHALL MEET THE SHOCK, VIBRATION, AND EXPLOSION-PROOF REQUIREMENTS OF ND 1002055.
4. SPECIAL CONDITIONING: (BY SUPPLIER)
   - A. RUN-IN: UNITS SHALL BE OPERATED FOR 1000 CYCLES WITH A CONTACT CURRENT OF 100 MA AND AN OPEN CIRCUIT VOLTAGE OF 28 VDC.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER


.153
.159 DIA X.19 MIN DEPTH
.123
.132
90°
VIEW A-A
INSERT RETAINING SPRING CLIP .032 NOM THK TO RETAIN SHAFT AS SHOWN IN DETAIL C AGAINST PULL OUT FORCE OF 10 LB MIN
.128
.121
.151
.130
.032
DETAIL C
.435
.425 ACROSS FLATS X .094
.084 THK HEX NUT
KEYWAY (SEE DETAIL B)
3/8-32UNEF-2A THD.
.505
.495 DIA X .027
.017 THK INTERNAL TOOTH LOCKWASHER
.505
.495 DIA X .036
.026 THK KEYWASHER .098
.088 WIDE TAB
.055
.045 DIA LEAD TYP 3 PLACES
.41 MAX
.516
.484 DIA
A
A
.26
.24
.31 MAX
.255
.245
.063
.070
.621
.591
.06 REF
1.13 MAX
1 2 3
.07 MIN
.515
.485
.799
.779
.046 REF
.031 REF
.187 MIN
DETAIL B
NORMALLY CLOSED
NORMALLY OPEN
COMMON
3 N.C.
1 C
2 N.O.
SYMBOL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES

HEAT TREATMENT:

FINAL FINISH: SEE NOTES

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN S. Crifree DATE 19 NOV 63
CHECKED J Ruggerio 19 Nov 63
APPROVAL
APPROVAL Eldon C Hall 16 Dec 63
NASA APPROVAL 12/17/63
MIT APPROVAL L. Hall 12/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH
HERMETIC SEAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006738
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006738

1006739 A

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10/14	6/10/64	

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY EXCITATION VOLTAGES PER TABLE 1.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: PER TABLE 1
   - G. PEAK TRANSIENT VOLTAGE: PER TABLE 1
   - H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL)

TABLE 1

DASH NO.	EXCITATION VOLTAGES	PEAK CONTINUOUS VOLTAGE	PEAK TRANSIENTVOLTAGE
-1	250 ± 25VRMS AT 800 ±10CPS SINEWAVE	420 V MAX.	500 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY
-2	150±15VRMS AT 800 ±10CPS SINEWAVE	250 V MAX.	300 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1/29/64

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT

DRAWN DATE 15 DEC 63
CHECKED 26 DEC 63
APPROVAL
APPROVAL 29 Jan 64
NASA APPROVAL 1/4/64
MIT APPROVAL 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (REGISTER)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006739
SCALE NONE WT SHEET 1 OF 2

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

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A 1006739

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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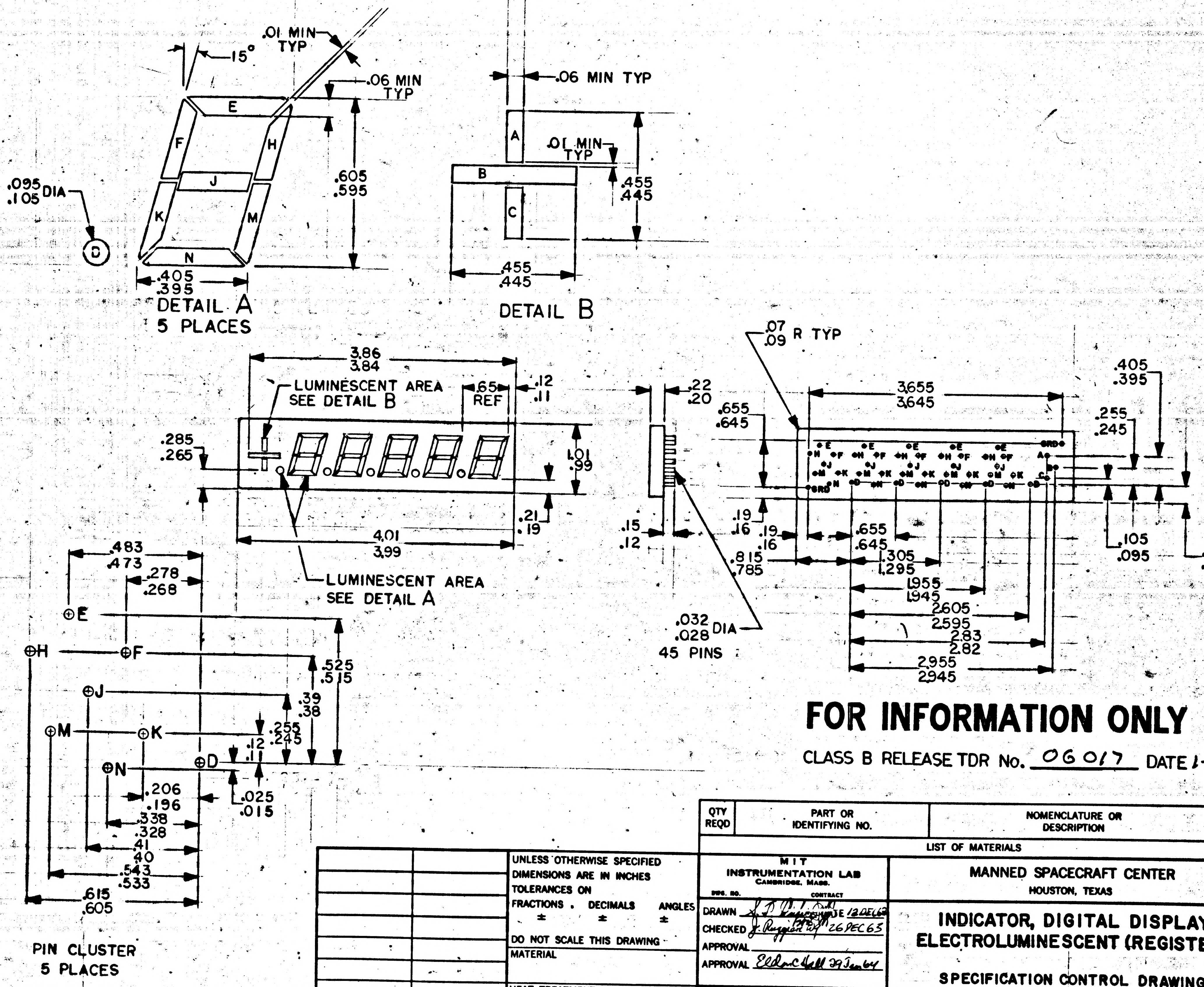
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DETAIL A
5 PLACES
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B
C
.01 MIN TYP
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DETAIL B
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LUMINESCENT AREA
SEE DETAIL B
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LUMINESCENT AREA
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PIN CLUSTER
5 PLACES

MASTER

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1-29-64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 12 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL [illegible] 1/24/64
MIT APPROVAL W Geffen 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (REGISTER)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006739
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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B 1006739

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10114	6/16/64	ck
B	REVISED PER TDRR 13431	10/20/64	

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL

(2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

(3) DIMENSIONS: SHALL BE AS SHOWN.

(4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY EXCITATION VOLTAGES PER TABLE 1.

(2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).

(3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).

B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

D. UNITS SHALL BE HERMETICALLY SEALED.

E. CONSTRUCTION: TO BE SPECIFIED.

F. PEAK CONTINUOUS VOLTAGE: PER TABLE 1

G. PEAK TRANSIENT VOLTAGE: PER TABLE 1

H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL)

TABLE 1

DASH NO.	EXCITATION VOLTAGES	PEAK CONTINUOUS VOLTAGE	PEAK TRANSIENTVOLTAGE
-1	250 ± 25VRMS AT 800 ±10CPS SINEWAVE	420 V MAX.	500 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY
-2	150±15VRMS AT 800 ±10CPS SINEWAVE	250 V MAX.	300 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1/29/64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 16 Dec 63
CHECKED 26 DEC 63
APPROVAL
APPROVAL 29 Jan 64
NASA APPROVAL
MIT APPROVAL 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (REGISTER)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006739
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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B 1006739 ④

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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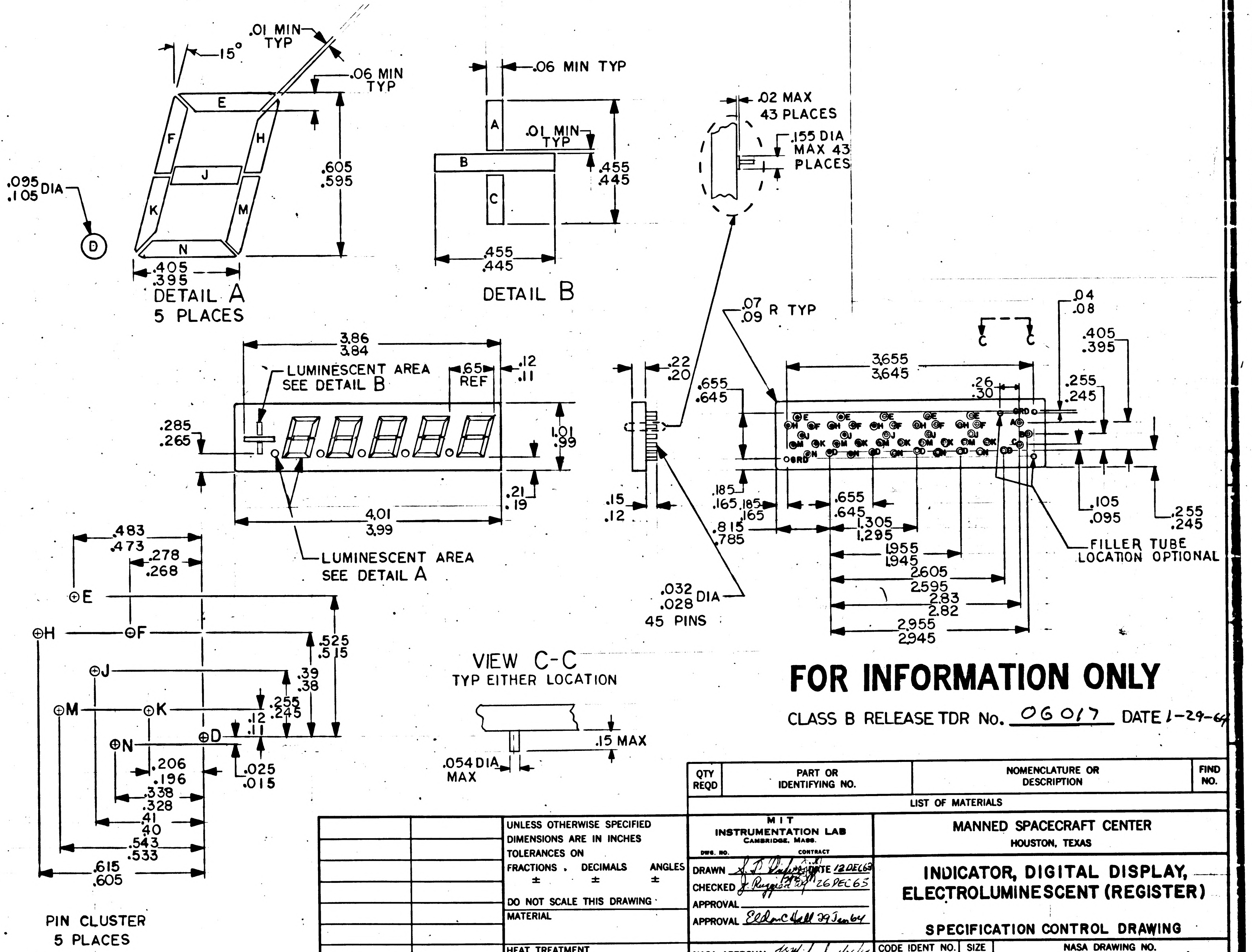
B	REVISED PER TDRR 13431	10/24/64	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D
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DETAIL A
5 PLACES
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A
B
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DETAIL B
.02 MAX
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MAX 43
PLACES
.07
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LUMINESCENT AREA
SEE DETAIL B
.65 REF
.12
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MASTER

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1-29-64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
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DRAWN DATE 12 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL 1/29/64
MIT APPROVAL 29 Jan 64

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INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (REGISTER)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006739
SCALE NONE
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SHEET 2 OF 2

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PHOTOGRAPHIC SCALE ONLY

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REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10/14	6/10/64	WK
B	REVISED PER TDRR 13431	11/20/64	
C	REVISED PER TDRR AND UPGRADED TO CLASS A 15512	1/26/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE GOLD PLATED MATERIAL.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY EXCITATION VOLTAGES PER TABLE 1.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1): 1.2 MA.
     - F. PEAK CONTINUOUS VOLTAGE: PER TABLE 1
     - G. PEAK TRANSIENT VOLTAGE: PER TABLE 1
     - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.
     - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

TABLE 1

DASH NO.	EXCITATION VOLTAGES	PEAK CONTINUOUS VOLTAGE	PEAK TRANSIENTVOLTAGE
-1	250 ± 25VRMS AT 800 ±10CPS SINEWAVE	420 V MAX.	500 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY
-2	150±15VRMS AT 800 ±10CPS SINEWAVE	250 V MAX.	300 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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CHECKED 26 DEC 63
APPROVAL
APPROVAL 29 Jan 64
NASA APPROVAL
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006739
SCALE NONE
WT
SHEET 1 OF 2

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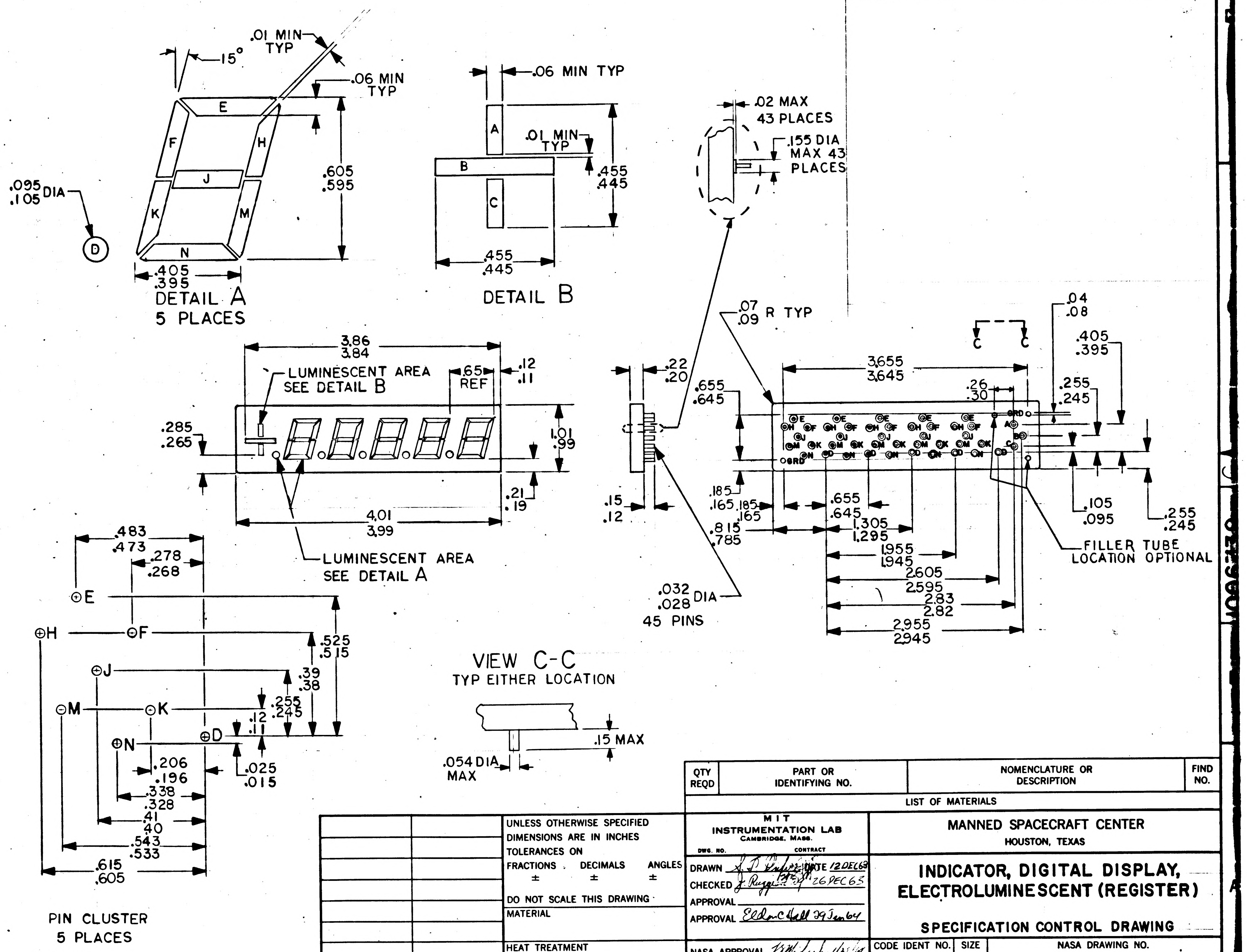
REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10114	6/10/64	wK
B	REVISED PER TDRR 13431	10/29/64	
C	REVISED AND UPGRADED TO CLASS A PER TDRR 15512	1/21/65	wK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TYP EITHER LOCATION
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MAX

PIN CLUSTER
5 PLACES

MASTER

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CHECKED J. Ruggiero 26DEC63
APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL
MIT APPROVAL W Goffer 29 Jan 64

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006739
SCALE NONE	WT	SHEET 2 OF 2

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D 1006739

REVISIONS	06017 1-29-64		
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10/14	6/4/64	WK
B	REVISED PER TDRR 13431	4/20/64	
C	REVISED PER TDRR AND UPGRADED TO CLASS A 15512	1/26/65	WK
D	REVISED PER TDRR 19192	6-2-65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, [illegible] PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL TIN PLATED PER MIL-T-10727, TYPE I, THICKNESS: 0.0001 MINIMUM: 0.00025 MAX. PRESERVATION COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY EXCITATION VOLTAGES PER TABLE 1.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1): 1.2 MA.
   - F. PEAK CONTINUOUS VOLTAGE: PER TABLE 1
   - G. PEAK TRANSIENT VOLTAGE: PER TABLE 1
   - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.
   - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

TABLE 1

DASH NO.	EXCITATION VOLTAGES	PEAK CONTINUOUS VOLTAGE	PEAK TRANSIENTVOLTAGE
-1	250 ± 25VRMS AT 800 ±10CPS SINEWAVE	420 V MAX.	500 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY
-2	150±15VRMS AT 800 ±10CPS SINEWAVE	250 V MAX.	300 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006739
SCALE NONE
WT
SHEET 1 OF 2

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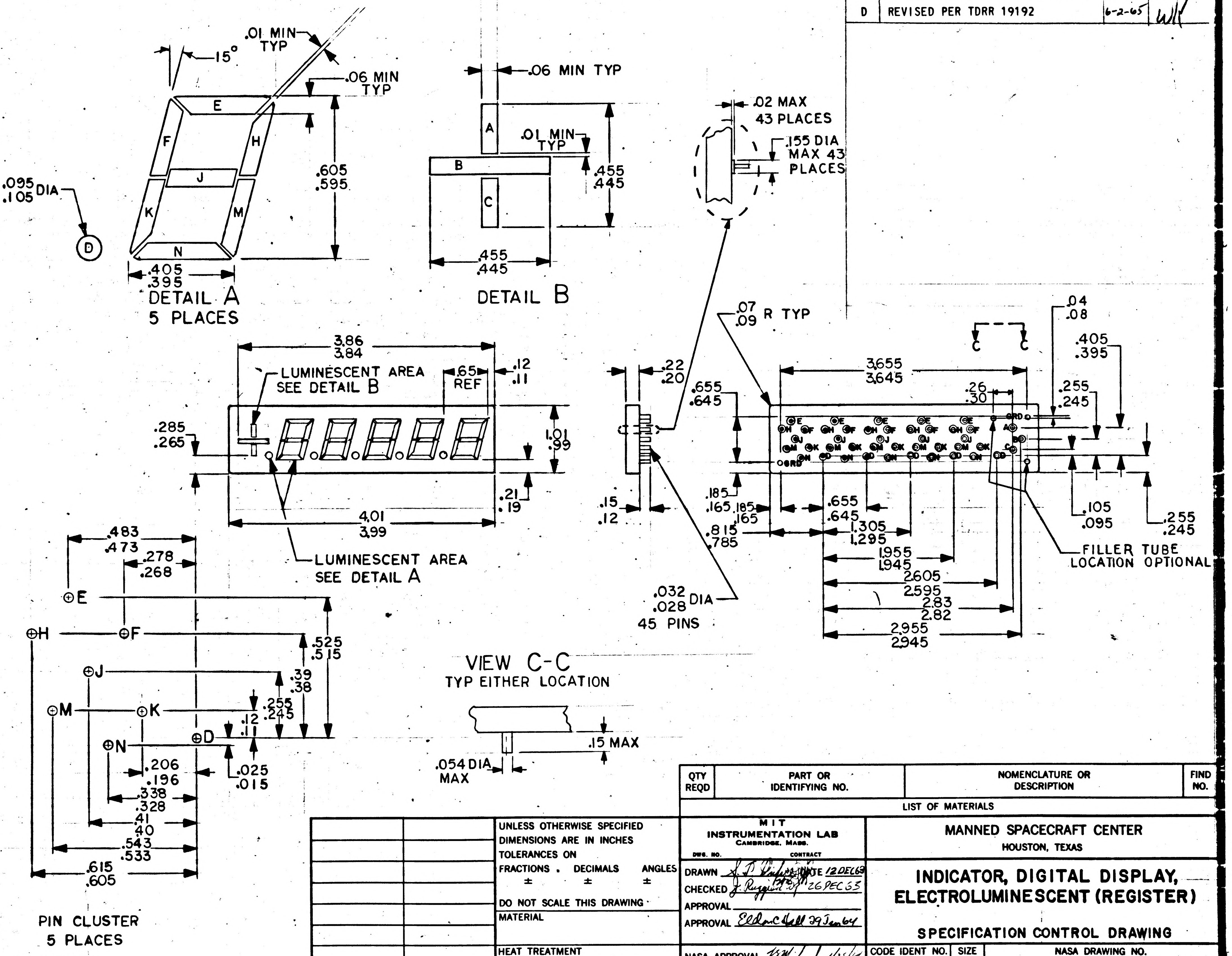
D 1006739

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10614	6/16/64	WK
B	REVISED PER TDRR 13431	10/29/64	
C	REVISED AND UPGRADED TO CLASS A PER TDRR 15512	1/26/65	WK
D	REVISED PER TDRR 19192	6-2-65	WK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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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NASA APPROVAL 1/29/64
MIT APPROVAL 29 Jan 64

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006739
SCALE NONE | WT | SHEET 2 OF 2

1006739 F

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS 06017 1-29-64			
A	REVISED PER TDRR 10114	6/10/64	WK
B	REVISED PER TDRR 13431	6/20/64	[illegible]
C	REVISED PER TDRR AND UPGRADED TO CLASS A 15512	1/26/65	W/K
D	REVISED PER TDRR 19192	6-2-65	WK
E	REVISED PER TDRR 22274	9/9/65	W/K
F	REVISED PER TDRR 22882	11/6/65	W/K

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
   - E. SERIALIZE UNITS PER ND1002023
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL TIN PLATED PER MIL-T-10727, TYPE I, THICKNESS: 0.0001 MINIMUM: 0.00025 MAX. PRESERVATION COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY EXCITATION VOLTAGES PER TABLE 1 BEFORE BURN-IN: 6.5 FOOT-LAMBERTS MIN. AFTER BURN-IN.
     - (2) POWER FACTOR: 0.40 MAXIMUM WHEN EXCITED PER 2.B.(1): AFTER BURN-IN
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B (1): 1.4 MA AFTER BURN-IN
     - (4) CASE-TO-ALL PIN RESISTANCE: 1.0 MEGOHM, MINIMUM
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: PER TABLE 1
   - G. PEAK TRANSIENT VOLTAGE: PER TABLE 1
   - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.
   - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
4. SPECIAL CONDITIONING BY VENDOR (BURN-IN): UNITS SHALL BE OPERATED AT 25°C FOR A PERIOD OF 100 HOURS WHILE EXCITED PER PARA. 2.B (1). BEFORE AND AFTER READINGS OF LIGHT INTENSITY, CURRENT AND POWER FACTOR SHALL ACCOMPANY EACH PART.

TABLE 1

DASH NO.	EXCITATION VOLTAGES	PEAK CONTINUOUS VOLTAGE	PEAK TRANSIENTVOLTAGE	FILLER TUBE CONFIGURATION
-1	250 ± 25VRMS AT 800 ±10CPS SINEWAVE	420 V MAX.	500 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY	.050 MAX DIA TUBE, SOLDER SEALED
-2	150 ± 15VRMS AT 800 ± 10CPS SINEWAVE	250 V MAX.	300 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY	.050 MAX. DIA TUBE, SOLDER SEALED
-3	250 ± 25 VRMS AT 800 ± 10 CPS SINEWAVE	420 V MAX.	500 V MAK NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY	.054 MAX DIA TUBE, PINCHED, .100 MAX WIDTH AT PINCH

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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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MATERIAL SEE NOTES
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DRAWN [illegible] DATE 15 DEC 63
CHECKED [illegible] 26 DEC 63
APPROVAL
APPROVAL [illegible] 29 Jan 64
NASA APPROVAL [illegible]
MIT APPROVAL WK 29 Jan 64

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HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (REGISTER)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 SIZE C NASA DRAWING NO. 1006739
SCALE NONE WT SHEET 1 OF 2

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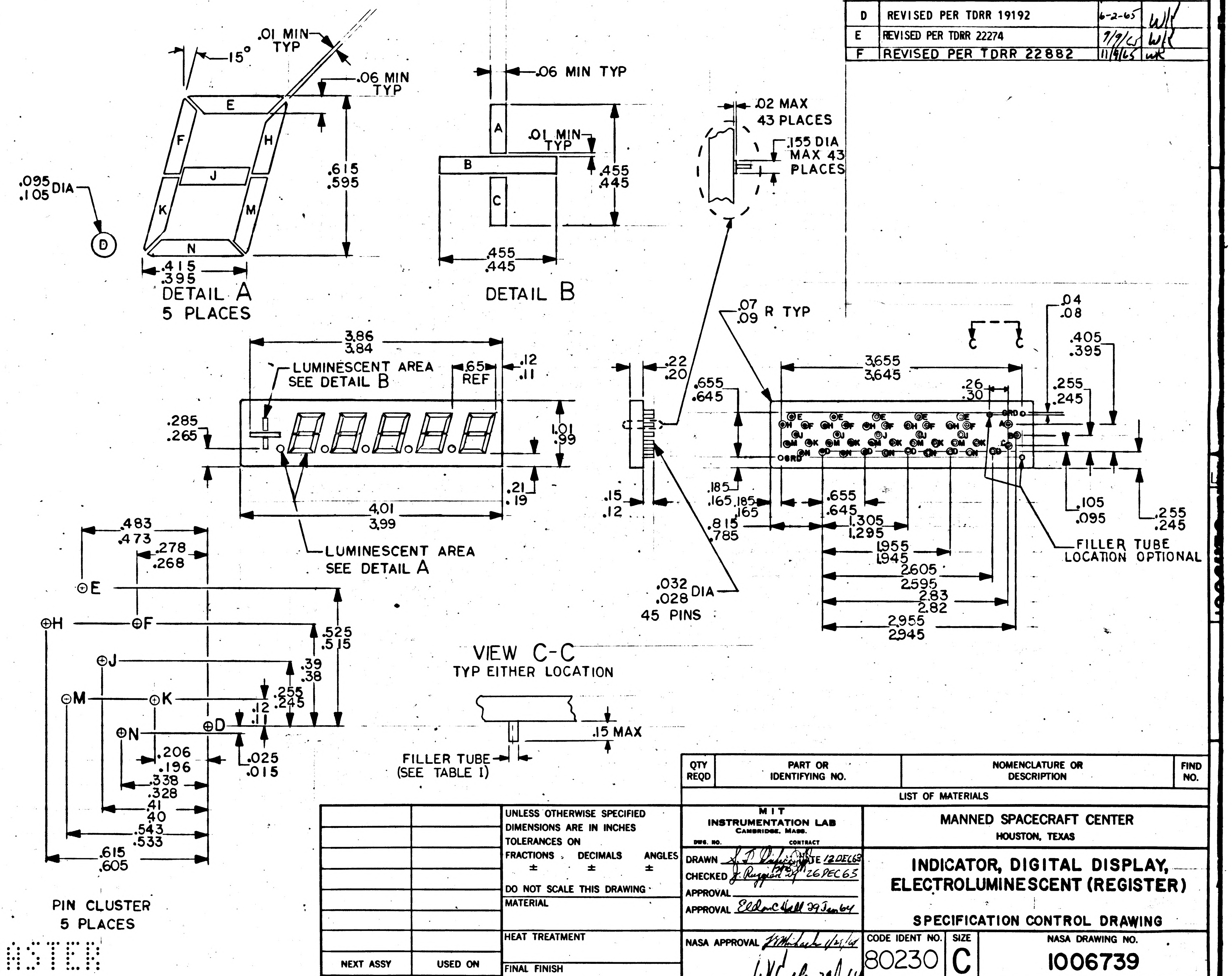
F 1006739

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10114	6/16/64	wk
B	REVISED PER TDRR 13431	10/29/64	
C	REVISED AND UPGRADED TO CLASS A PER TDRR 15512	1/26/65	wk
D	REVISED PER TDRR 19192	6-2-65	WK
E	REVISED PER TDRR 22274	9/9/65	WK
F	REVISED PER TDRR 22882	11/9/65	wk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(SEE TABLE I)

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
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APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL 1/29/64
MIT APPROVAL 29 Jan 64

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006739
SCALE NONE	WT	SHEET 2 OF 2

1006739 G

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS 06017 1-29-64		
A	REVISED PER TDRR 10114	6/14/64	WK
B	REVISED PER TDRR 13431	6/26/64	
C	REVISED PER TDRR AND UPGRADED TO CLASS A 15512	1/26/65	WK
D	REVISED PER TDRR 19192	6-2-65	WK
E	REVISED PER TDRR 22274	9/9/65	WK
F	REVISED PER TDRR 22882	11/6/65	WK
G	REVISED PER TDRR 24505	12/14/65	WK

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NOTES:

1. GENERAL REQUIREMENTS:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
    - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
    - D. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS OF ND1002056. INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.
    - E. SERIALIZE UNITS PER ND1002023
2. ACCEPTANCE AND INSPECTION (100%)
    - A. MECHANICAL PROPERTIES:
        - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL TIN PLATED PER MIL-T-10727, TYPE I, THICKNESS: 0.0001 MINIMUM: 0.00025 MAX. PRESERVATION COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
        - (2)
        - (3) DIMENSIONS: SHALL BE AS SHOWN.
        - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
    - B. ELECTRICAL CHARACTERISTICS:
        - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY EXCITATION VOLTAGES PER TABLE 1 BEFORE BURN-IN: 6.5 FOOT-LAMBERTS MIN. AFTER BURN-IN.
        - (2) POWER FACTOR: 0.40 MAXIMUM WHEN EXCITED PER 2.B.(1): AFTER BURN-IN
        - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B (1): 1.4 MA AFTER BURN-IN
        - (4) CASE-TO-ALL PIN RESISTANCE: 1.0 MEGOHM, MINIMUM
3. DESIGN REQUIREMENTS:
    - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C
    - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
    - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
    - D. UNITS SHALL BE HERMETICALLY SEALED.
    - E. CONSTRUCTION: TO BE SPECIFIED.
    - F. PEAK CONTINUOUS VOLTAGE: PER TABLE 1
    - G. PEAK TRANSIENT VOLTAGE: PER TABLE 1
    - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.
    - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
4. SPECIAL CONDITIONING BY VENDOR (BURN-IN): UNITS SHALL BE OPERATED AT 25°C FOR A PERIOD OF 100 HOURS WHILE EXCITED PER PARA. 2.B (1). BEFORE AND AFTER READINGS OF LIGHT INTENSITY, CURRENT AND POWER FACTOR SHALL ACCOMPANY EACH PART.

TABLE 1

DASH NO.	EXCITATION VOLTAGES	PEAK CONTINUOUS VOLTAGE	PEAK TRANSIENTVOLTAGE	FILLER TUBE CONFIGURATION
-1	250 ± 25VRMS AT 800 ±10CPS SINEWAVE	420 V MAX.	500 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY	.050 MAX DIA TUBE, SOLDER SEALED
-2	150 ± 15VRMS AT 800 ± 10CPS SINEWAVE	250 V MAX.	300 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY	.050 MAX. DIA TUBE, SOLDER SEALED
-3	250 ± 25 VRMS AT 800 ± 10 CPS SINEWAVE	420 V MAX.	500 V MAX NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY	.054 MAX DIA TUBE, PINCHED, .100 MAX WIDTH AT PINCH

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT:
FINAL FINISH:

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DWG. NO. CONTRACT

DRAWN DATE 15 Dec 63
CHECKED 26 DEC 63
APPROVAL
APPROVAL 29 Jan 64
NASA APPROVAL
MIT APPROVAL W Kupfer 29 Jan 64

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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (REGISTER)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006739
SCALE NONE
WT
SHEET 1 OF 2

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G 1006739

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 10614	6/16/64	WK
B	REVISED PER TDRR 13431	10/29/64	[illegible]
C	REVISED AND UPGRADED TO CLASS A PER TDRR 15512	1/26/65	WK
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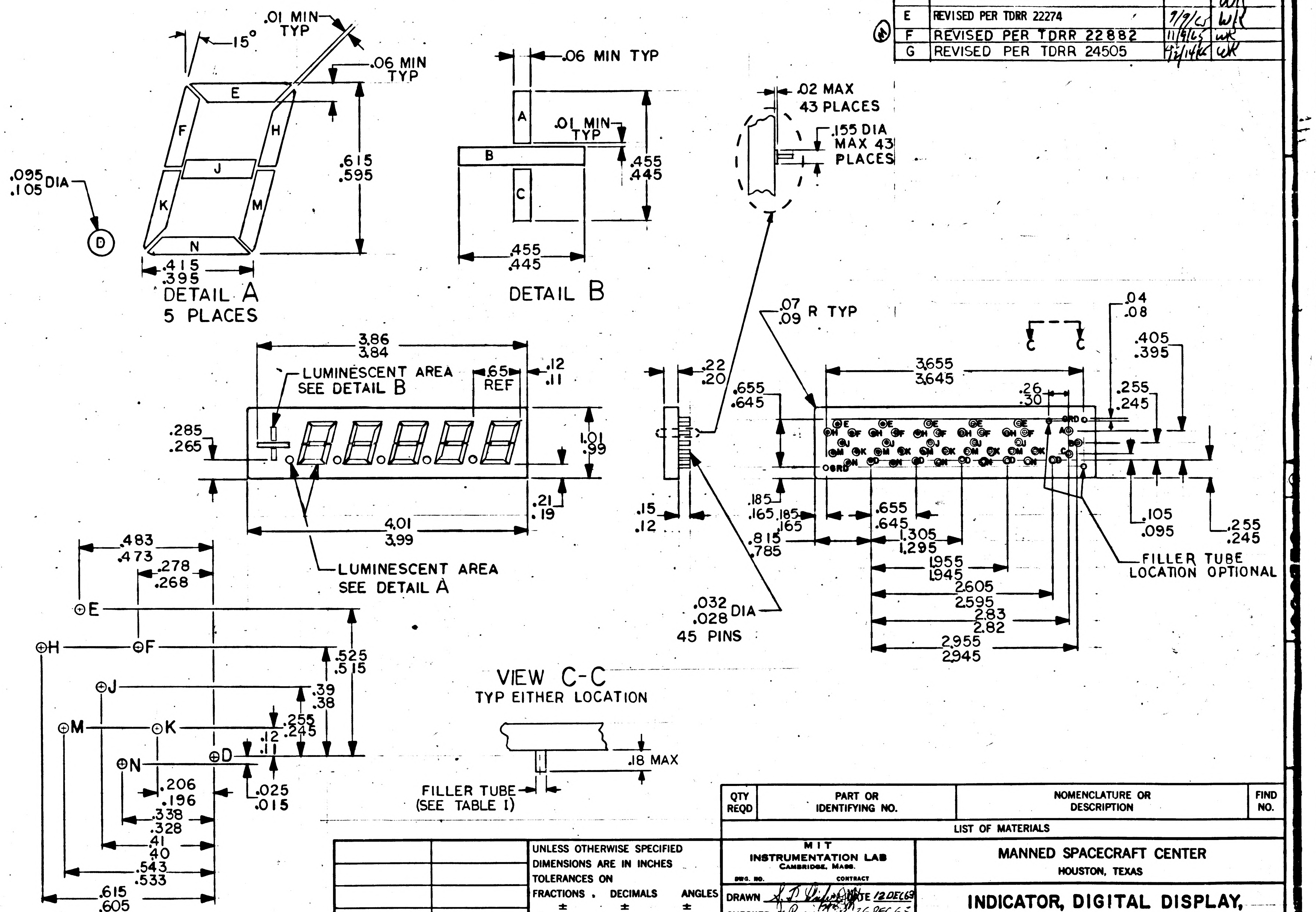
F	REVISED PER TDRR 22882	11/9/65	WK
G	REVISED PER TDRR 24505	12/14/66	WK



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FILLER TUBE
(SEE TABLE I)

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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CONTRACT
DRAWN [illegible] DATE 12 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL [illegible] 1/29/64
MIT APPROVAL W Geoffer 29 Jan 64

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006739
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SHEET 2 OF 2

MASTER

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL PER MIL-[illegible].
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL)

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1/29/64

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MASTER

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SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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DRAWN J. Anfine DATE 16 Dec 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C. Hall 29 Jan 64
NASA APPROVAL 1/4/64
MIT APPROVAL W Kupfer 29 Jan 64

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INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (REGISTER)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006739
SCALE NONE WT SHEET 1 OF 2

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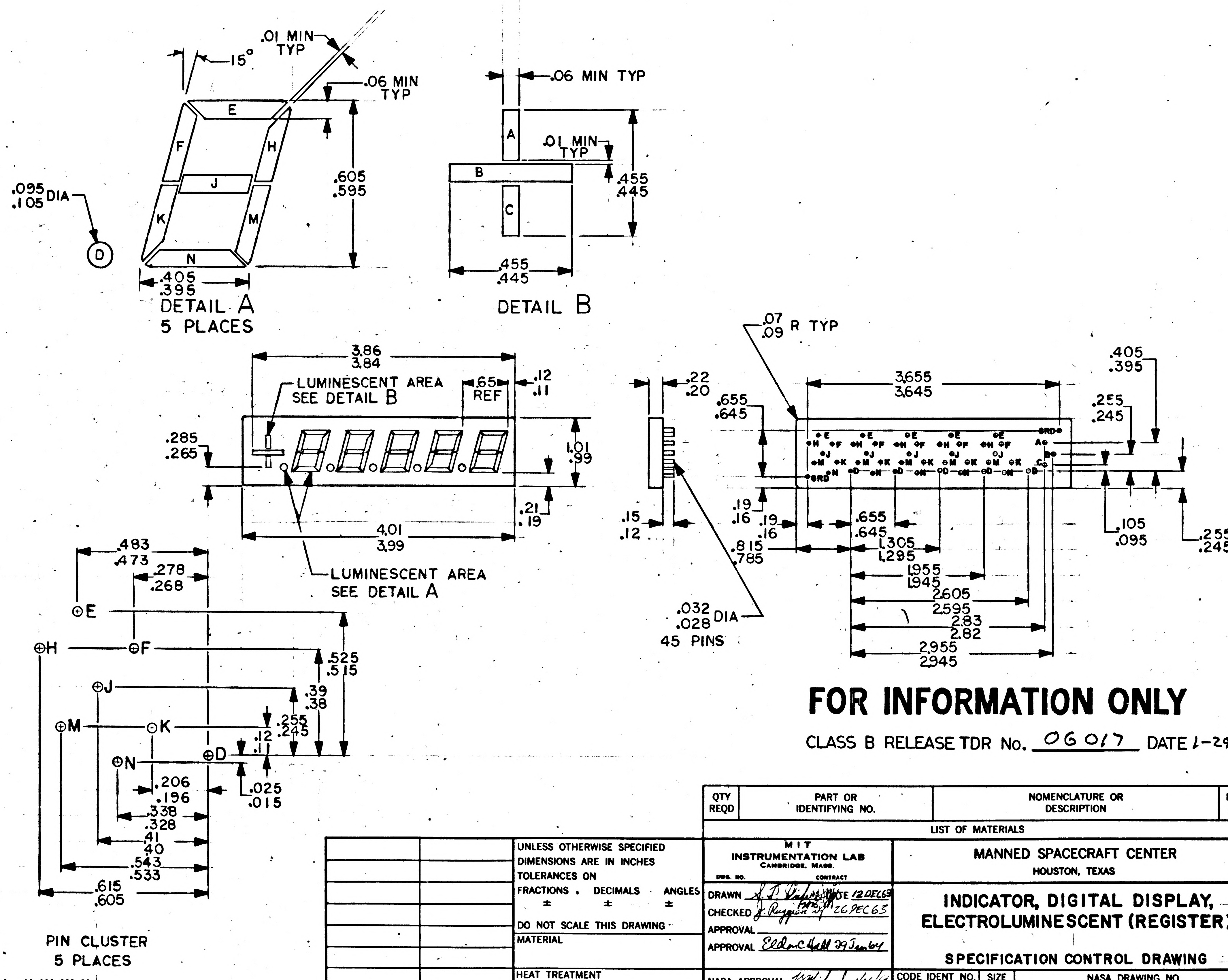
1006739

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1-29-64

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LIST OF MATERIALS

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DRAWN S. P. Piper DATE 12 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL 1/29/64
MIT APPROVAL 29 Jan 64

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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (REGISTER)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006739
SCALE NONE	WT	SHEET 2 OF 2

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1006740 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1)): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1-29-64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S. Chifire DATE 5 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 24 Jan 64
NASA APPROVAL 1/23/4
MIT APPROVAL 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB—NOUN)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006740

SCALE NONE WT SHEET 1 OF 2

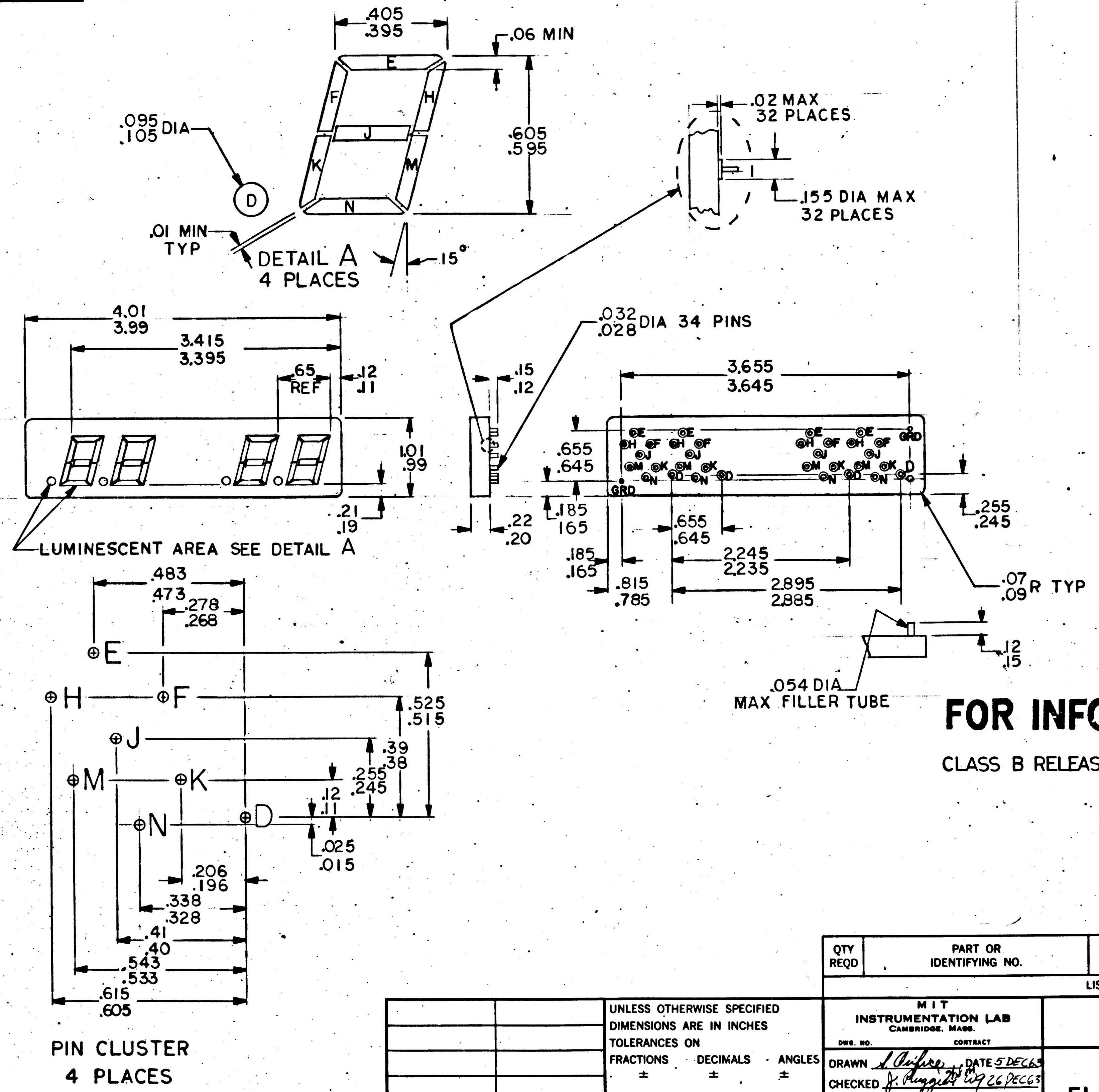
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006740 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429	11/24/64	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PIN CLUSTER
4 PLACES

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1-29-64

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN S. Quifice DATE 5 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL 1/29/64
MIT APPROVAL 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (VERB-NOUN)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B	1006740

REVISIONS 06017 1-29-64			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429	1/29/64	
B	REVISED PER TDRR AND UPGRADED TO CLASS A 15511	1/26/65	WYC

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE GOLD PLATED MATERIAL.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)): 1.0 MA.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).
   - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.
   - K. LEAD STRENGTH: LEAD SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN L. Chiofir DATE 5 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 24 Jan 64
NASA APPROVAL 1/25/4
MIT APPROVAL 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB—NOUN)

SPECIFICATION CONTROL DRAWING

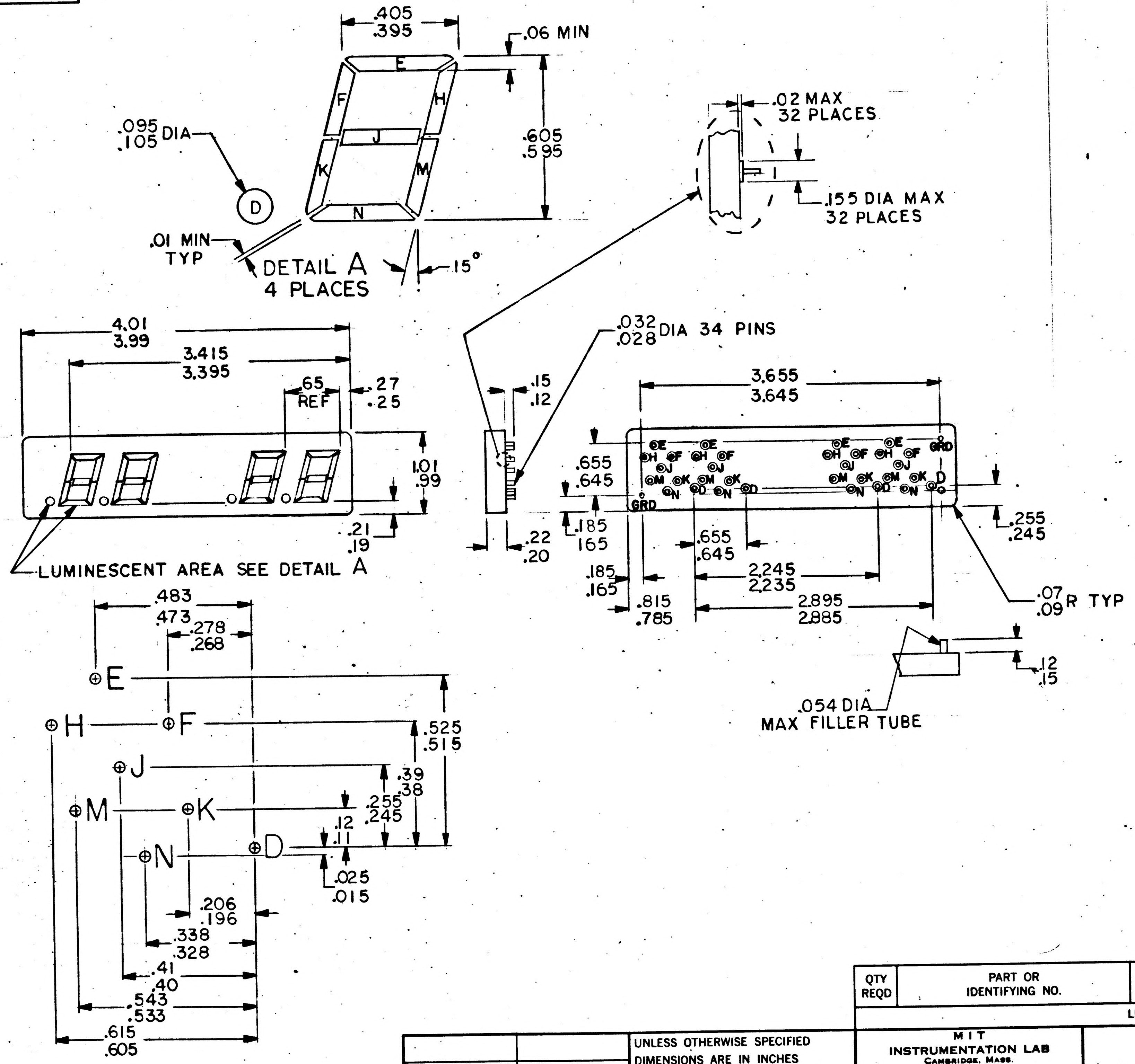
CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006740 (M)

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429	1/21/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15511	1/26/65	wH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PIN CLUSTER
4 PLACES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S Oifice DATE 5 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 29 Jan 64
NASA APPROVAL
MIT APPROVAL 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB-NOUN)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 2 OF 2

4 3 2 1

1006740 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429		
B	REVISED PER TDRR AND UPGRADED TO CLASS A 15511	1/26/65	WK
C	REVISED PER TDRR 18022		WK

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

2. ACCEPTANCE AND INSPECTION (100%)

   A. MECHANICAL PROPERTIES:

      (1) LEAD MATERIAL: SHALL BE ~~A SOLDERABLE~~ GOLD PLATED MATERIAL.

      (2)

      (3) DIMENSIONS: SHALL BE AS SHOWN.

      (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)

   B. ELECTRICAL CHARACTERISTICS:

      (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.

      (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).

      (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)): 1.0 MA.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).

   B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

   C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

   D. UNITS SHALL BE HERMETICALLY SEALED.

   E. CONSTRUCTION: TO BE SPECIFIED.

   F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

   G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.

   H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).

   J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.

   K. LEAD STRENGTH: LEAD SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S. Chifire DATE 5 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 24 Jan 64
NASA APPROVAL 1/25/64
MIT APPROVAL W Kupfer 29 Jan 64

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HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB—NOUN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 1 OF 2

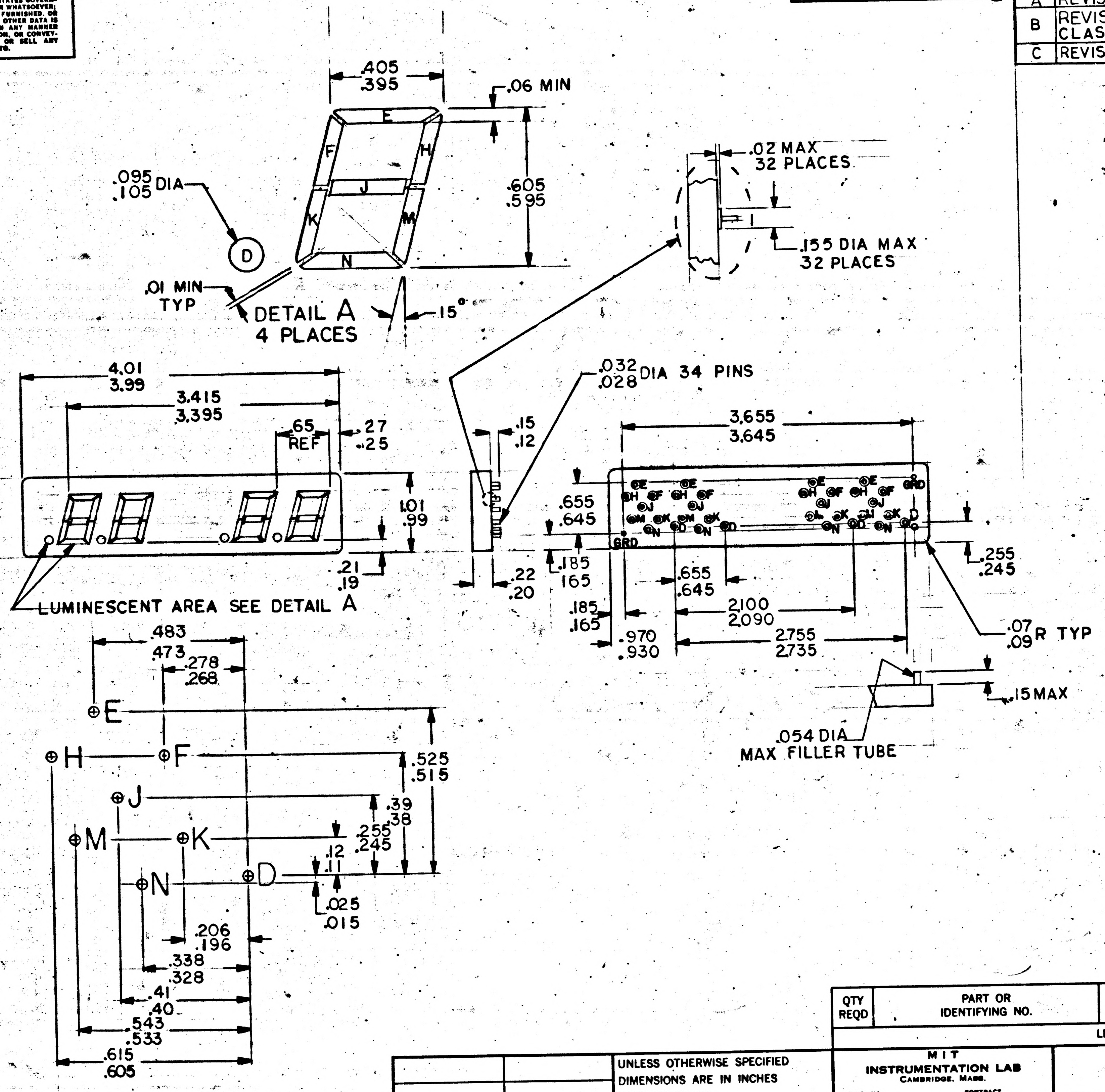
4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006740 C

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429	1/24/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15511	1/24/65	WH
C	REVISED PER TDRR 18022		WH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PIN CLUSTER
4 PLACES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN L. Aufiero DATE 5 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 24 Jan 64
NASA APPROVAL 1/25/64
MIT APPROVAL 29 Jan 64

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HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB-NOUN)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 2 OF 2

D 1006740

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429		
B	REVISED PER TDRR AND UPGRADED TO CLASS A 15511	1/26/65	WK
C	REVISED PER TDRR 18022		WK
D	REVISED PER TDRR 19191	6-2-65	WK

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

2. ACCEPTANCE AND INSPECTION (100%)

   A. MECHANICAL PROPERTIES:

      (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.

      (2)

      (3) DIMENSIONS: SHALL BE AS SHOWN.

      (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)

   B. ELECTRICAL CHARACTERISTICS:

      (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.

      (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).

      (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)): 1.0 MA.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).

   B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

   C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

   D. UNITS SHALL BE HERMETICALLY SEALED.

   E. CONSTRUCTION: TO BE SPECIFIED.

   F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

   G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.

   H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).

   J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.

   K. LEAD STRENGTH: LEAD SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
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DRAWN DATE 5 DEC 63
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APPROVAL
APPROVAL Eldon C Hall 24 Jan 64
NASA APPROVAL 1/25/64
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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB—NOUN)

SPECIFICATION CONTROL DRAWING

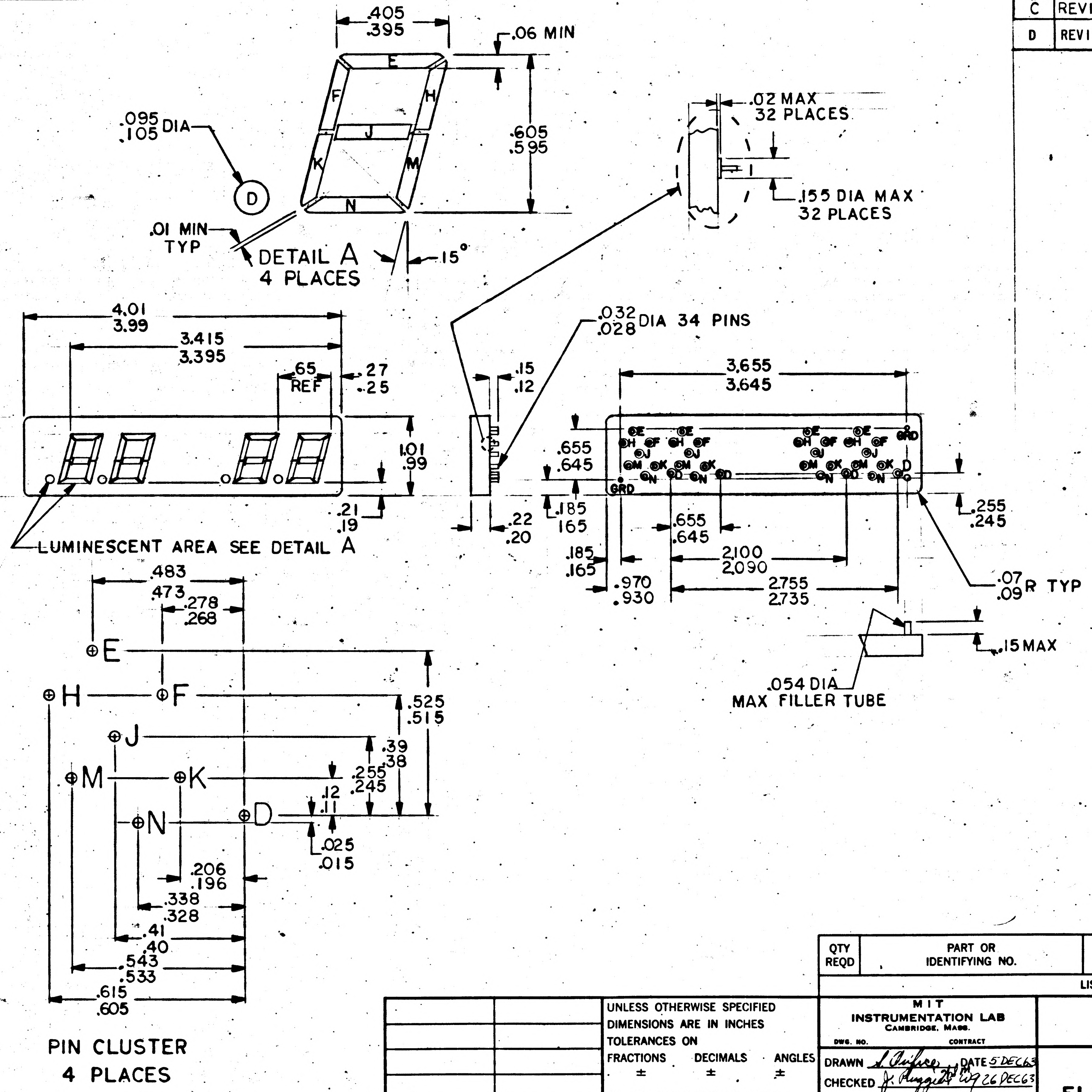
CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006740 D ⑭

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429	1/21/64	[illegible]
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15511	1/26/65	WH
C	REVISED PER TDRR 18022		WH
D	REVISED PER TDRR 19191	6-2-65	WH



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PIN CLUSTER
4 PLACES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPROVAL
APPROVAL Eldon C Hall 24 Jan 29
NASA APPROVAL [illegible] 1/29/64
MIT APPROVAL [illegible] 29 Jan 64

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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB-NOUN)

SPECIFICATION CONTROL DRAWING

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SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 2 OF 2

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1006740 E

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429		
B	REVISED PER TDRR AND UPGRADED TO CLASS A 15511	1/26/65	WK
C	REVISED PER TDRR 18022		WK
D	REVISED PER TDRR 19191	6-2-65	WK
E	REVISED PER TDRR 22275	9/28/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
   - E. SERIALIZE UNITS PER ND 1002023
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)): 1.0 MA.
     - (4) CASE-TO-ALL PINS RESISTANCE: 1.0 MEGOHM, MINIMUM.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1). AT 25°C
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).
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TABLE I

DASH NO	FILLER TUBE CONFIGURATION
1	.050 MAX DIA TUBE SOLDER SEALED
2	.054 MAX DIA TUBE PINCHED 100 MAX WIDTH AT PINCH

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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DRAWN L. Chifire DATE 5 DEC 63
CHECKED J. Ruggiero 26 DEC 63
APPROVAL
APPROVAL Eldon C Hall 24 Jan 64
NASA APPROVAL 1/25/64
MIT APPROVAL W Kupfer 29 Jan 64

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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB—NOUN)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 1 OF 2

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E 1006740 (M)

REVISIONS 06017 1-29-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13429	1/24/64	
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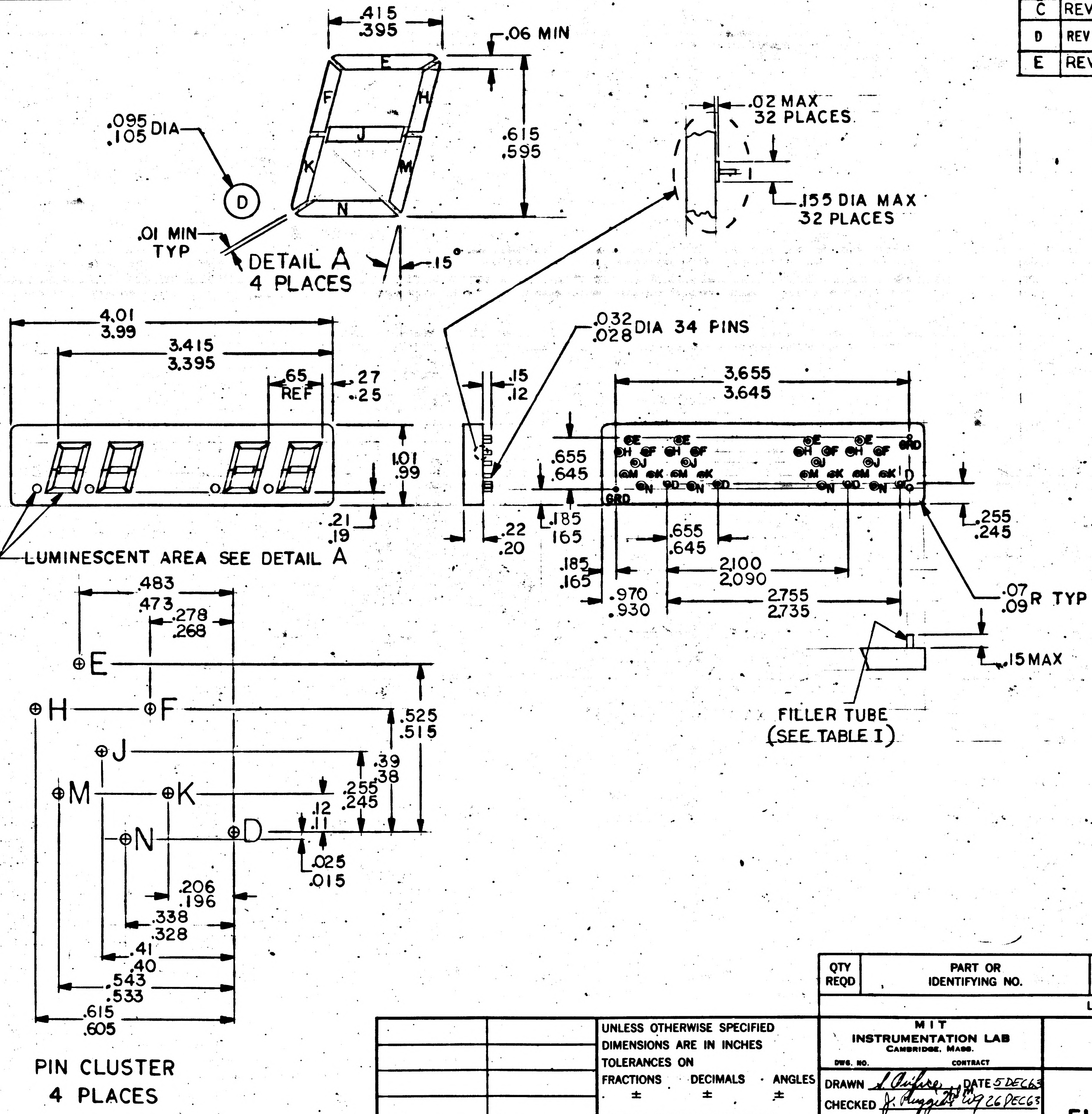
D	REVISED PER TDRR 19191	6-2-65	WK
E	REVISED PER TDRR 22275	9/28/65	WK



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FILLER TUBE
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PIN CLUSTER
4 PLACES

MASTER

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TOLERANCES ON

FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

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LIST OF MATERIALS

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APPROVAL
APPROVAL Eldon C Hall 24 Jan 29
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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB-NOUN)

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1006740 | F

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS 06017 1-29-64			
A	REVISED PER TDRR 13429		
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F	REVISED PER TDRR 22882	15 Oct 65	

NOTES:

1. GENERAL REQUIREMENTS:
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   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
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   E. SERIALIZE UNITS PER ND 1002023
2. ACCEPTANCE AND INSPECTION (100%)
   A. MECHANICAL PROPERTIES:
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      (3) DIMENSIONS: SHALL BE AS SHOWN.
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   B. ELECTRICAL CHARACTERISTICS:
      (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE BEFORE BURN-IN: 6.5 FOOT LAMBERTS MIN. AFTER BURN-IN.
      (2) POWER FACTOR: 0.40 MAXIMUM WHEN EXCITED PER 2.B.(1) AFTER BURN-IN.
      (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)): 1.0 MA. AFTER BURN-IN.
      (4) CASE-TO-ALL PINS RESISTANCE: 1.0 MEGOHM, MINIMUM.
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   A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1). AT 25°C
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   E. CONSTRUCTION: TO BE SPECIFIED.
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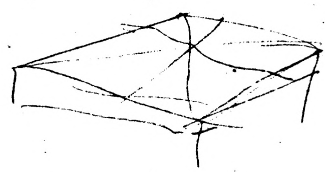
   H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).
   J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS, GREY SUBSTRATE.
   K. LEAD STRENGTH: LEAD SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
4. SPECIAL CONDITIONING BY VENDOR (BURN-IN): UNITS SHALL BE OPERATED AT 25°C FOR A PERIOD OF 100 HOURS WHILE EXCITED PER PARA. 2. B. (1). BEFORE AND AFTER READINGS OF LIGHT INTENSITY, CURRENT, AND POWER FACTOR SHALL ACCOMPANY EACH PART.

TABLE I

DASH NO	FILLER TUBE CONFIGURATION
1	.050 MAX DIA TUBE SOLDER SEALED
2	.054 MAX DIA TUBE PINCHED 100 MAX WIDTH AT PINCH



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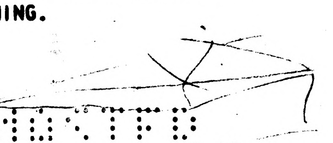

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APPROVAL Eldon C Hall 24 Jan 64
NASA APPROVAL 1/23/64
MIT APPROVAL W Kupfer 29 Jan 64

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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB—NOUN)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 | SIZE C | NASA DRAWING NO. 1006740
SCALE NONE | WT | SHEET 1 OF 2

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F 1006740 (M)

REVISIONS 06017 1-29-64

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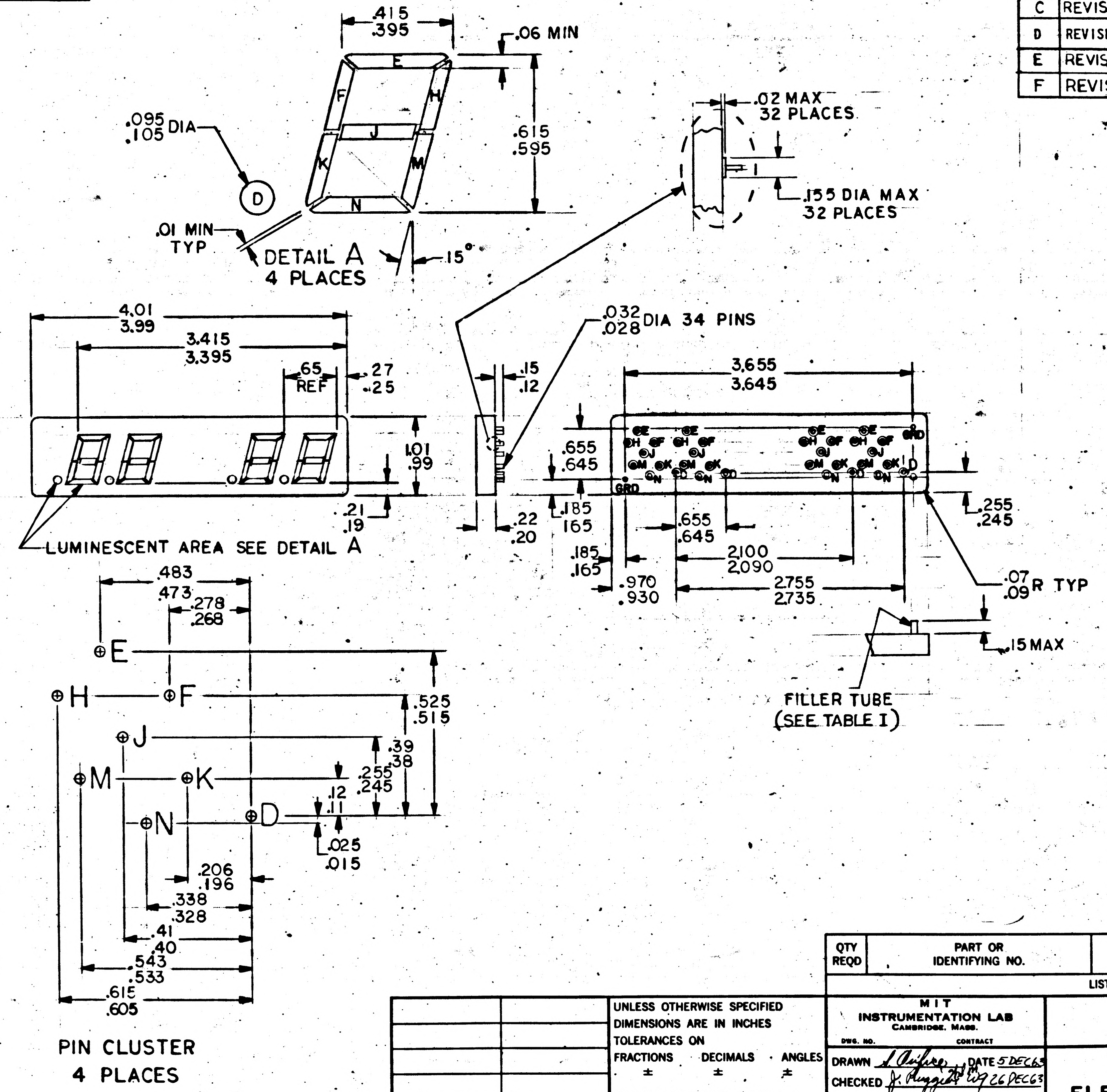
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INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (VERB-NOUN)

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   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL, HERMETICALLY SEALED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1)): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1-29-6

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	NO.

LIST OF MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN L. Alifano
CHECKED R. Ruggiero
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL W. Kupfer 29 June

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (VERB—NOUN)

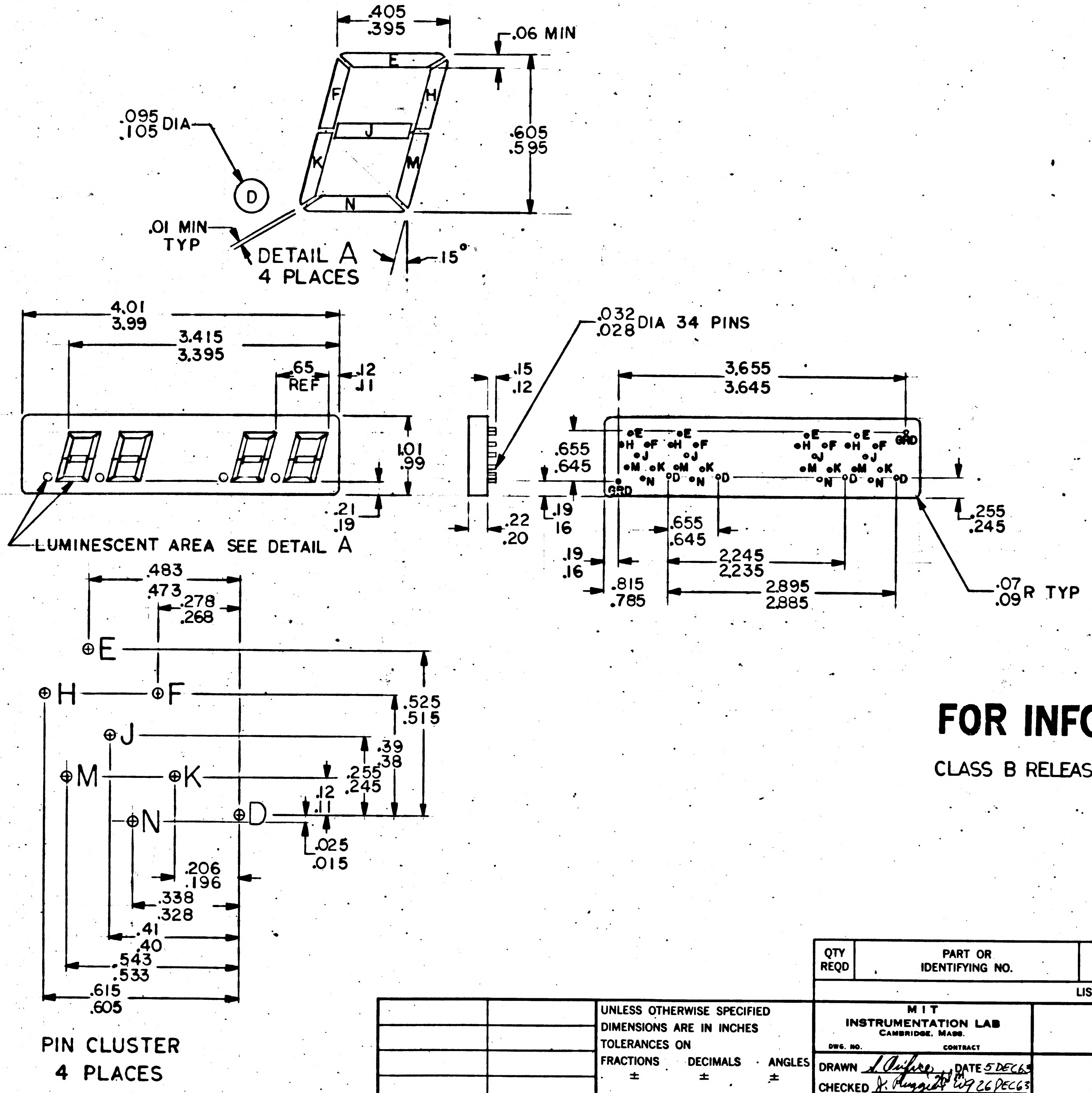
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006740

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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PIN CLUSTER
4 PLACES

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06017 DATE 1-29-64

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 5 DEC 63
CHECKED 26 DEC 63
APPROVAL
APPROVAL Alden C Hall 24 Jan 64
NASA APPROVAL 1/25/64
MIT APPROVAL 29 Jan 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (VERB-NOUN)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006740
SCALE NONE
WT
SHEET 2 OF 2

4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

Ⓜ 1006744 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	[illegible]	[illegible]

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)

   A. MECHANICAL PROPERTIES:

      (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL HERMETICALLY SEALED.

      (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

      (3) DIMENSIONS: SHALL BE AS SHOWN.

      (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)

   B. ELECTRICAL CHARACTERISTICS:

      (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.

      (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).

      (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).

   B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

   C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

   D. UNITS SHALL BE HERMETICALLY SEALED.

   E. CONSTRUCTION: TO BE SPECIFIED.

   F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

   G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.

   H. LIGHT OUTPUT (WAVE LENGTH) : 5100 ANGSTROMS (NOMINAL)

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

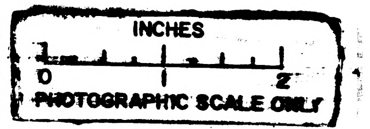
MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 3 FEB 64
CHECKED R Sargent 13 FEB 64 AJM
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL [illegible] 5/15/64
MIT APPROVAL [illegible] 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006744
SCALE NONE WT
SHEET 1 OF 2

4 3 2 1



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1006744 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
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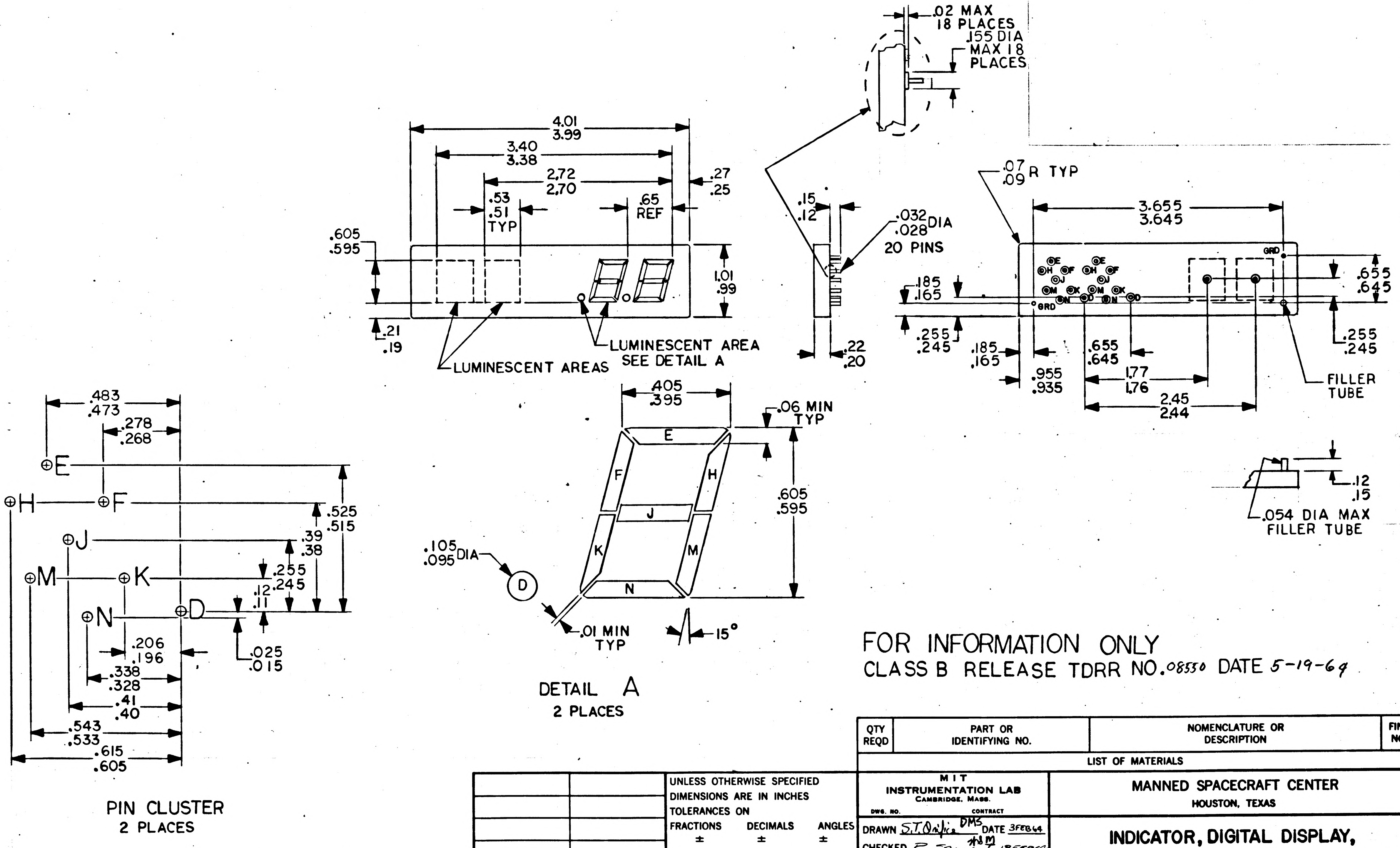
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LUMINESCENT AREAS
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2 PLACES

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 3FEB64
CHECKED R Sargent HSM 13FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006744
SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006744 B Ⓜ

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/26/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE GOLD PLATED MATERIAL.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1): 3.0 MA.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH) : 5100 ANGSTROMS (NOMINAL)
   - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS GREY SUBSTRATE.
   - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Onifice DMS DATE 3 FEB 64
CHECKED R. Sargent 13 FEB 64 AJM
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL [illegible] 5/5/64
MIT APPROVAL D Hazel 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006744
SCALE NONE WT SHEET 1 OF 2

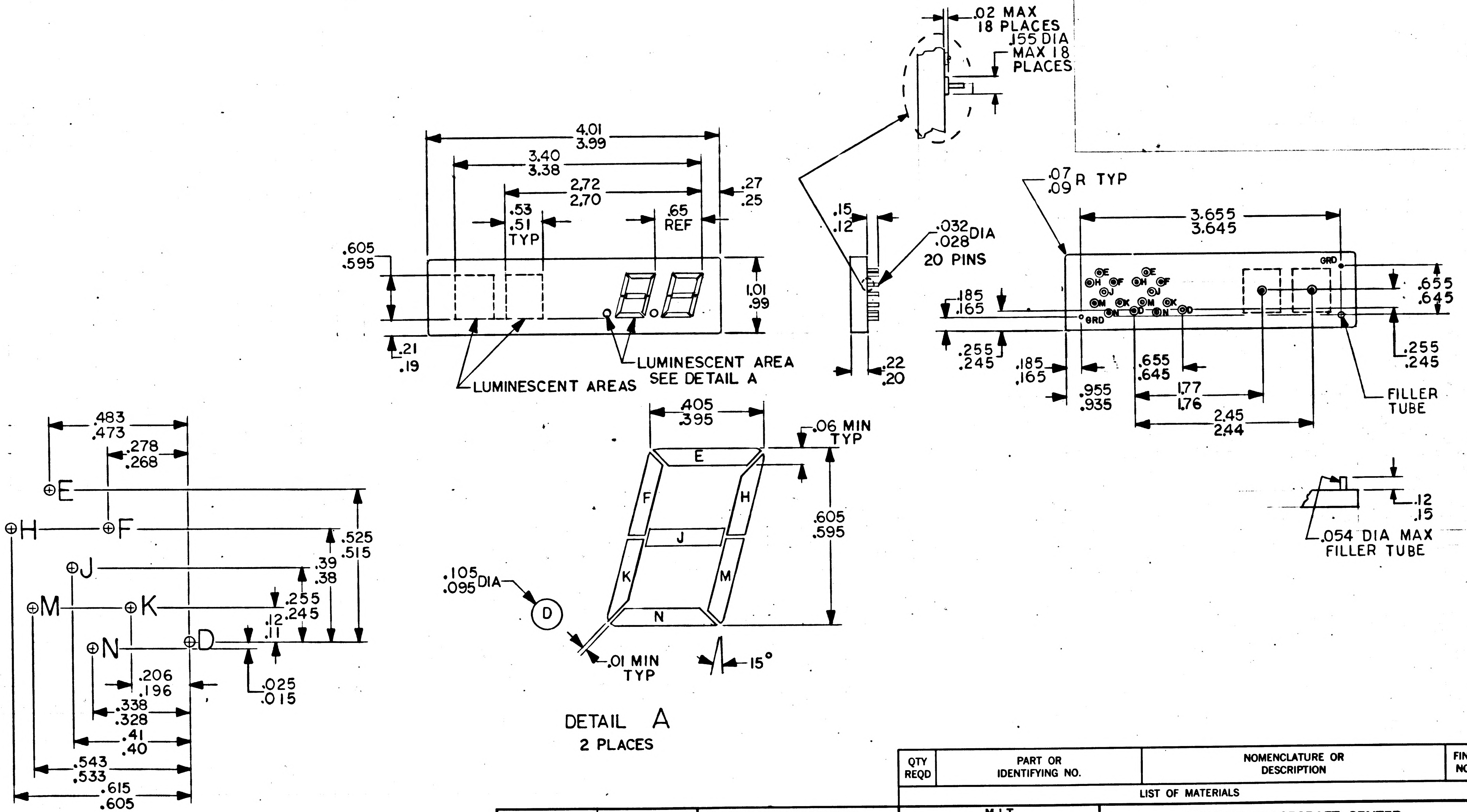
1006744 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006744 B Ⓜ

REVISIONS 0 8550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/30/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK



.02 MAX
18 PLACES
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MAX 18
PLACES
4.01
3.99
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LUMINESCENT AREAS
LUMINESCENT AREA
SEE DETAIL A
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DETAIL A
2 PLACES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 3FEB64
CHECKED R. Sargent HAM 13FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006744
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006744 C

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10Aug64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK
C	REVISED PER TDRR 18023		WK

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER. (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

2. ACCEPTANCE AND INSPECTION (100%)

A. MECHANICAL PROPERTIES:

(1) LEAD MATERIAL: SHALL BE A SOLDERABLE GOLD PLATED MATERIAL.

(2)

(3) DIMENSIONS: SHALL BE AS SHOWN.

(4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.

(2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).

(3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1): 3.0 MA.

3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1)]

B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

D. UNITS SHALL BE HERMETICALLY SEALED.

E. CONSTRUCTION: TO BE SPECIFIED.

F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.

H. LIGHT OUTPUT (WAVE LENGTH) : 5100 ANGSTROMS (NOMINAL)

J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS GREY SUBSTRATE.

K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

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CLASS [illegible] RELEASE TDRR NO. DATE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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MATERIAL SEE NOTES
HEAT TREATMENT
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DRAWN S.T. Orifice DMS DATE 3 FEB 64
CHECKED E Sargent ASM 13FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/5/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

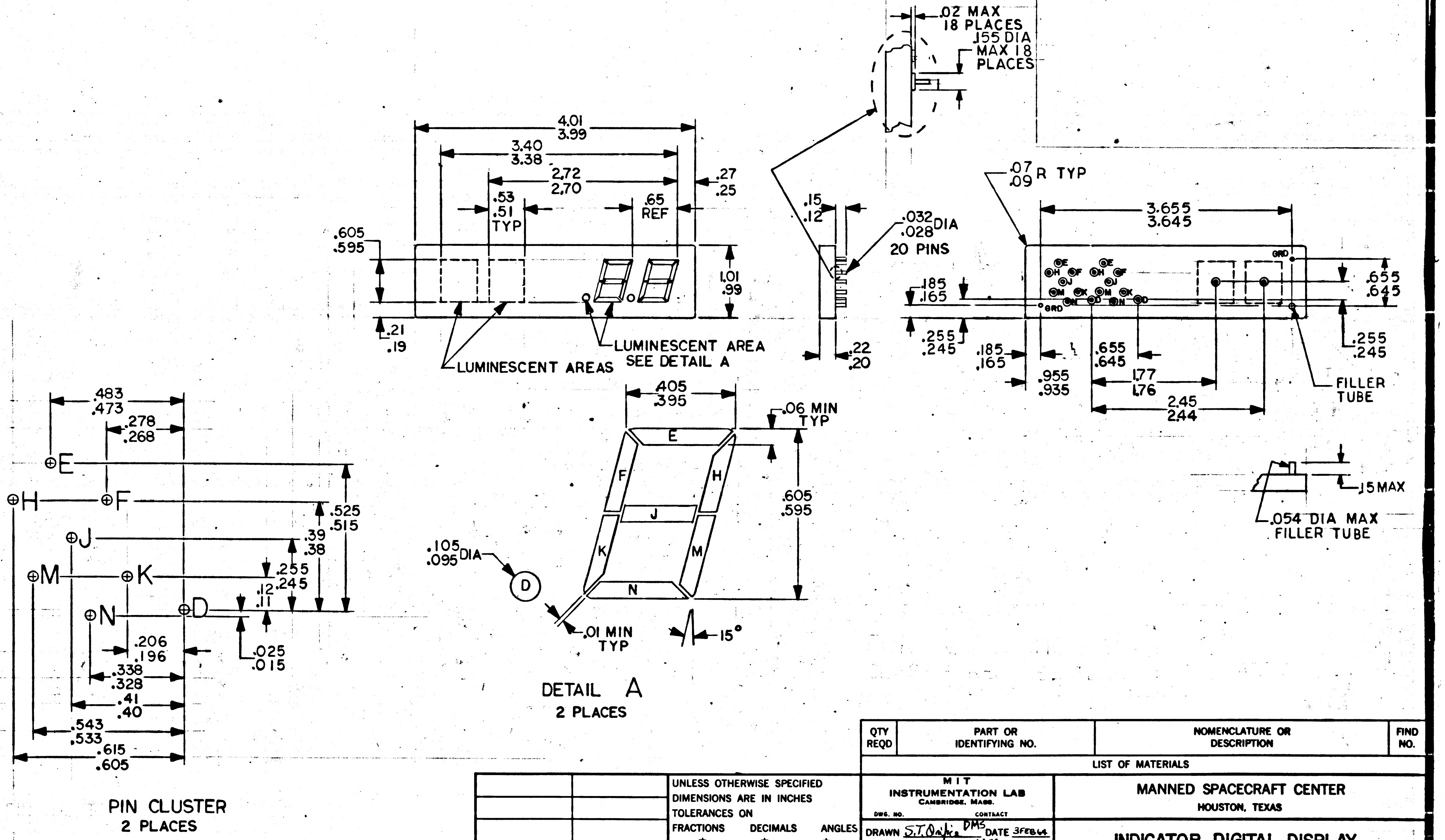
CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006744
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

C 1006744 Ⓜ

REVISIONS 0 8550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/26/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK
C	REVISED PER TDRR 18023		WK



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LUMINESCENT AREAS
LUMINESCENT AREA
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PIN CLUSTER
2 PLACES

DETAIL A
2 PLACES

MASTER

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NASA APPROVAL 5/17/64
MIT APPROVAL 5/19/64

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INDICATOR, DIGITAL DISPLAY,
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SHEET 2 OF 2

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REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/20/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK
C	REVISED PER TDRR 18023		WK
D	REVISED PER TDRR 19190	6-2-65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATION COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1): 3.0 MA.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH) : 5100 ANGSTROMS (NOMINAL)
   - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS GREY SUBSTRATE.
   - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

FOR INFORMATION ONLY
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LIST OF MATERIALS

NEXT ASSY	USED ON
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HEAT TREATMENT
FINAL FINISH

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DRAWN S.T. Orifice DMS DATE 3 FEB 64
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APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/15/64
MIT APPROVAL 5/19/64

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006744

SCALE NONE WT SHEET 1 OF 2

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D 1006744 Ⓜ

REVISIONS 0 8550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/26/64	
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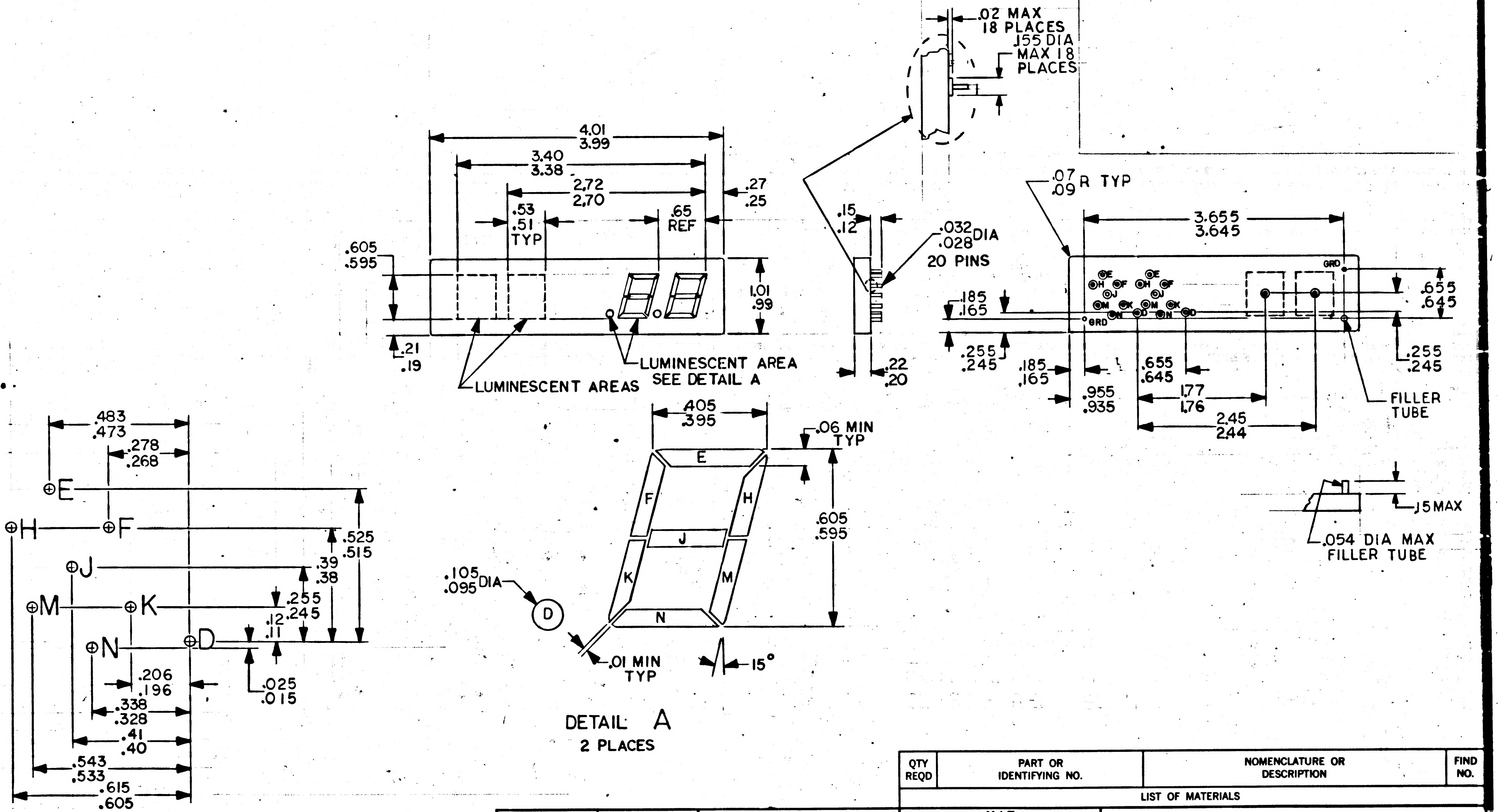
C	REVISED PER TDRR 18023		WK
D	REVISED PER TDRR 19190	6-2-65	WK.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MAX 18
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2.70
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PIN CLUSTER
2 PLACES

DETAIL A
2 PLACES

MASTER

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LIST OF MATERIALS

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006744

SCALE NONE WT SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006744 E Ⓜ

	REVISIONS 08550 5-19-64		
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/29/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK
C	REVISED PER TDRR 18023		WK
D	REVISED PER TDRR 19190	6-2-65	WK
E	REVISED PER TDRR 22276	9/14	mom

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
   - E. SERIALIZE UNITS PER ND 1002023
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATION COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1): 3.0 MA.
     - (4) CASE-TO-ALL PINS RESISTANCE: 1.0 MEGOHM, MINIMUM.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1), AT 25°C
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH) : 5100 ANGSTROMS (NOMINAL)
   - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS GREY SUBSTRATE.
   - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

TABLE I

DASH NO.	FILLER TUBE CONFIGURATION
-1	.050 MAX. DIA TUBE, SOLDER SEALED
-2	.054 MAX DIA TUBE PINCHED, .100 MAX WIDTH AT PINCH

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

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	LIST OF MATERIALS		

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CHECKED R Sargent 13 FEB 64 ASM
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/5/64
MIT APPROVAL 5/19/64

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006744
SCALE NONE
WT
SHEET 1 OF 2

1006744 E

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1006744 E

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REVISIONS 0 8550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/26/64	
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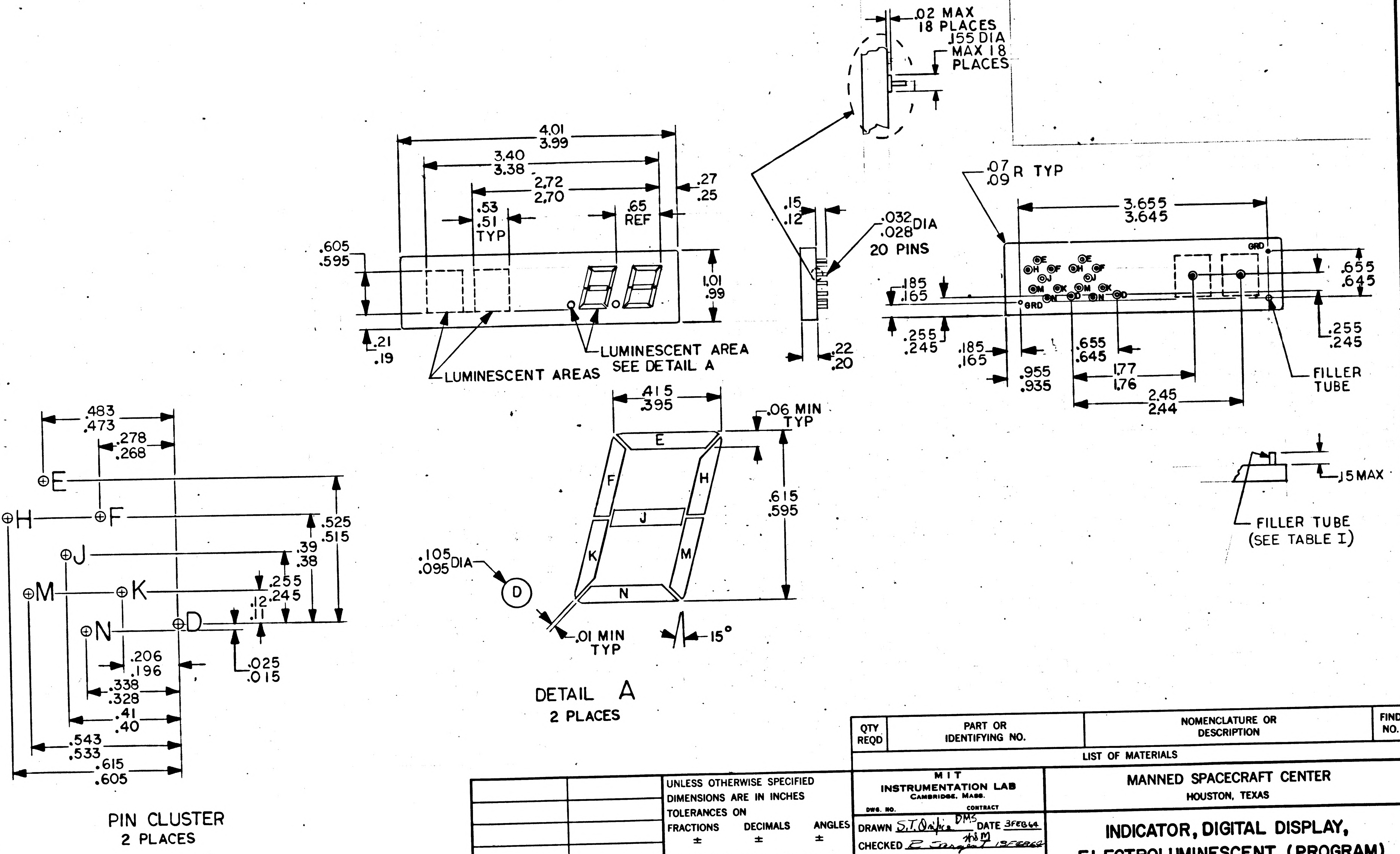
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FILLER
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FILLER TUBE
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A	REVISED PER TDRR 13441	10/30/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK
C	REVISED PER TDRR 18023		WK
D	REVISED PER TDRR 19190	6-2-65	WK
E	REVISED PER TDRR 22276	9/14	mdm
F	REVISED PER TDRR 22882	10/19/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
   - E. SERIALIZE UNITS PER ND 1002023
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE I. THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATION COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE. BEFORE BURN-IN; 6.5 FOOT-LAMBERTS MIN. AFTER BURN-IN.
     - (2) POWER FACTOR: 0.40 MAXIMUM WHEN EXCITED PER 2.B.(1) AFTER BURN-IN.
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1): 3.0 MA. AFTE BURN-IN.
     - (4) CASE-TO-ALL PINS RESISTANCE: 1.0 MEGOHM, MINIMUM.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1), AT 25°C
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH) : 5100 ANGSTROMS (NOMINAL)
   - J. FRONT GLASS SHALL BE 70% TRANSMISSION GLASS GREY SUBSTRATE.
   - K. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
4. SPECIAL CONDITIONING BY VENDOR (BURN-IN); UNITS SHALL BE OPERATED AT 25°C FOR A PERIOD OF 100 HOURS WHILE EXCITED PER PERA 2.B(1). BEFORE AND AFTER READINGS OF LIGHT INTENSITY, CURRENT, AND POWER FACTOR SHALL ACCOMPANY EACH PART

TABLE I

DASH NO.	FILLER TUBE CONFIGURATION
-1	.050 MAX. DIA TUBE, SOLDER SEALED
-2	.054 MAX DIA TUBE PINCHED, .100 MAX WIDTH AT PINCH

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL **SEE NOTES**
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. DMS DATE 3FEB64
CHECKED R Sargent 13FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/15/64
MIT APPROVAL D Hoag 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

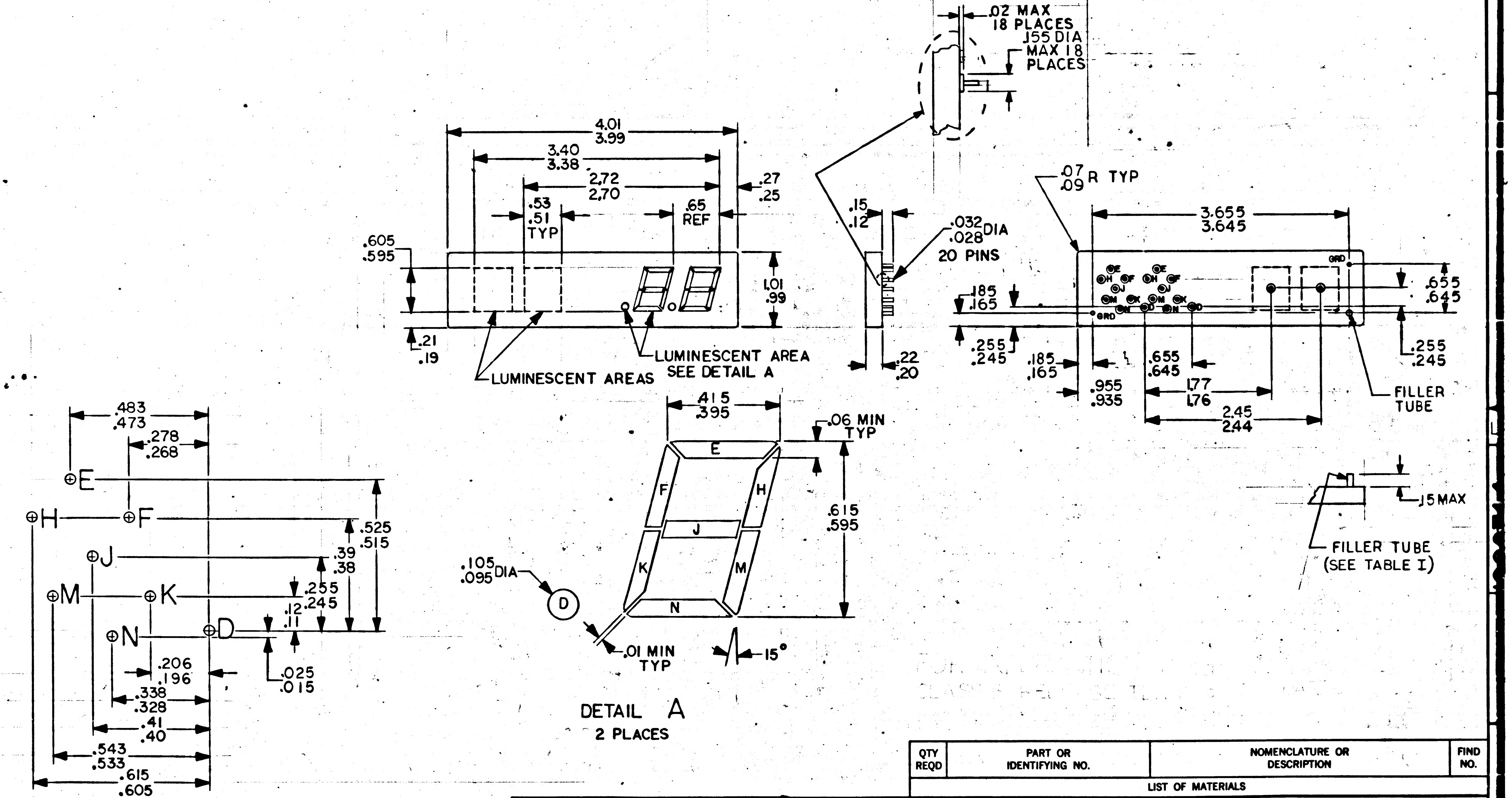
CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006744
SCALE NONE	WT	SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006744 | F | Ⓜ

REVISIONS 0 8550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/26/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK
C	REVISED PER TDRR 18023		WK
D	REVISED PER TDRR 19190	6-2-65	WK
E	REVISED PER TDRR 22276	9/14	MGM
F	REVISED PER TDRR 22882	10/15/65	WK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18 PLACES
.155 DIA
MAX 18
PLACES
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3.40
3.38
2.72
2.70
.27
.25
.53
.51
TYP
.65
REF
.605
.595
1.01
.99
.21
.19
LUMINESCENT AREAS
LUMINESCENT AREA
SEE DETAIL A
.15
.12
.032
.028 DIA
20 PINS
.22
.20
.07
.09 R TYP
3.655
3.645
GRD
.655
.645
.185
.165
.255
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.185
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.955
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.655
.645
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1.76
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2.44
.255
.245
FILLER
TUBE
.15 MAX
FILLER TUBE
(SEE TABLE I)
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.268
E
H
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.525
.515
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PIN CLUSTER
2 PLACES
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TYP
.615
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.01 MIN
TYP
15°
DETAIL A
2 PLACES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

NEXT ASSY | USED ON
APPLICATION

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orifice DMS DATE 3FEB64
CHECKED R Sargent HSM 13FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (PROGRAM)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006744
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006744 | —

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL HERMETICALLY SEALED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH) : 5100 ANGSTROMS (NOMINAL)

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orifice DMS DATE 3 FEB 64
CHECKED E Sargent 13 FEB 64 JJM
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/15/64
MIT APPROVAL D Hoag 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

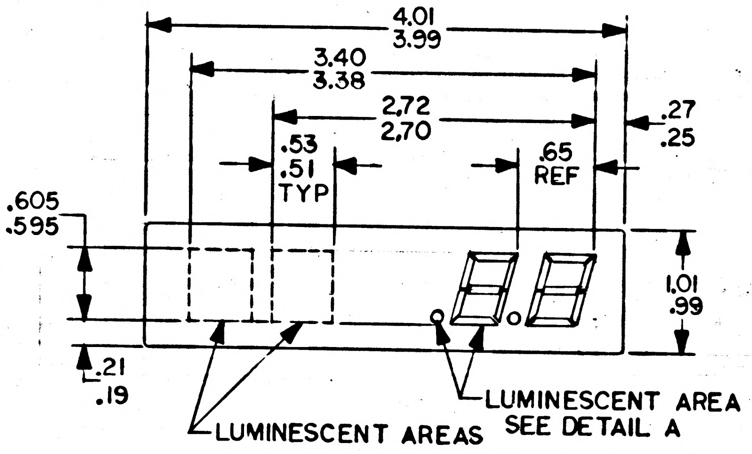
CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006744
SCALE NONE WT. SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

–	1006744

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL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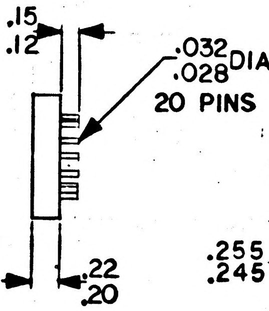
LUMINESCENT AREA
SEE DETAIL A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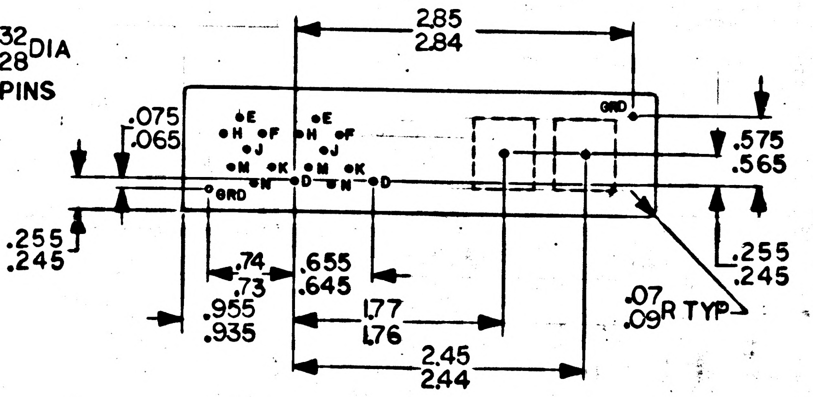
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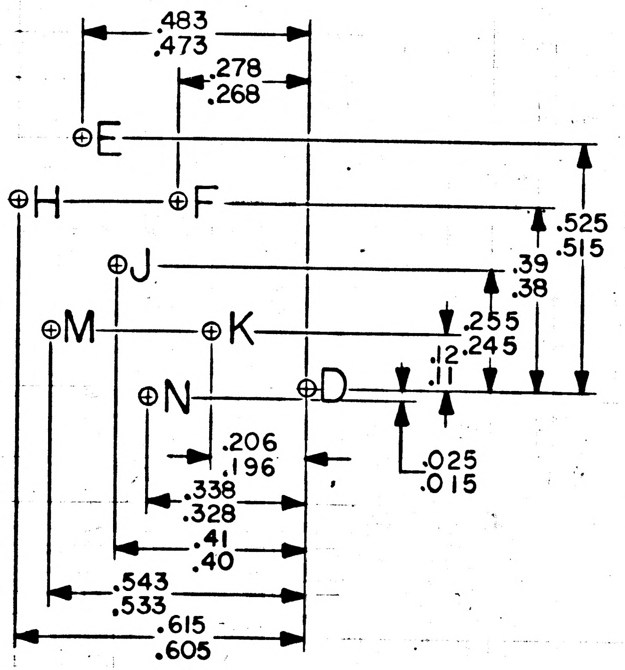
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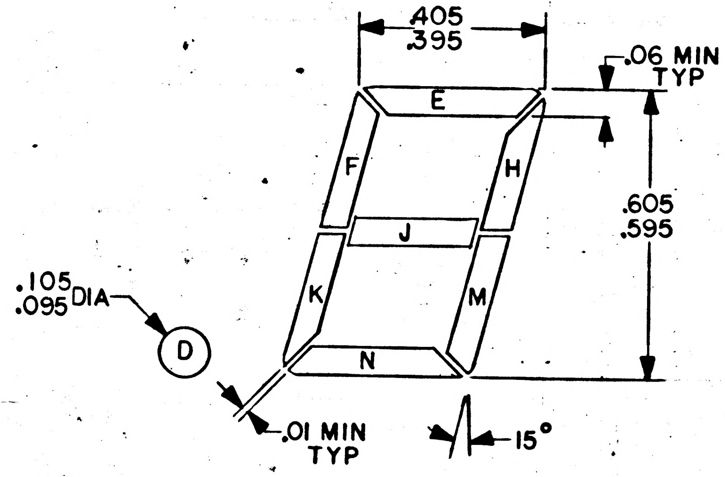
PIN CLUSTER
2 PLACES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DETAIL A
2 PLACES

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

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MANNED SPACECRAFT CENTER
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DRAWN S.T. Orfice DMS DATE 3FEB64
CHECKED R. Sargent HSM 13FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (PROGRAM)
SPECIFICATION CONTROL DRAWING

NASA APPROVAL 5/17/64
MIT APPROVAL 5/19/64

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006744
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006745 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL, HERMETICALLY SEALED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1)): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Ojilice DMS DATE 6FEB64
CHECKED F.W. Bounds 7FEB64
APPROVAL
APPROVAL Eldon C. Hall 15 May 64
NASA APPROVAL M. Michael 5/18/64
MIT APPROVAL L. Hazel 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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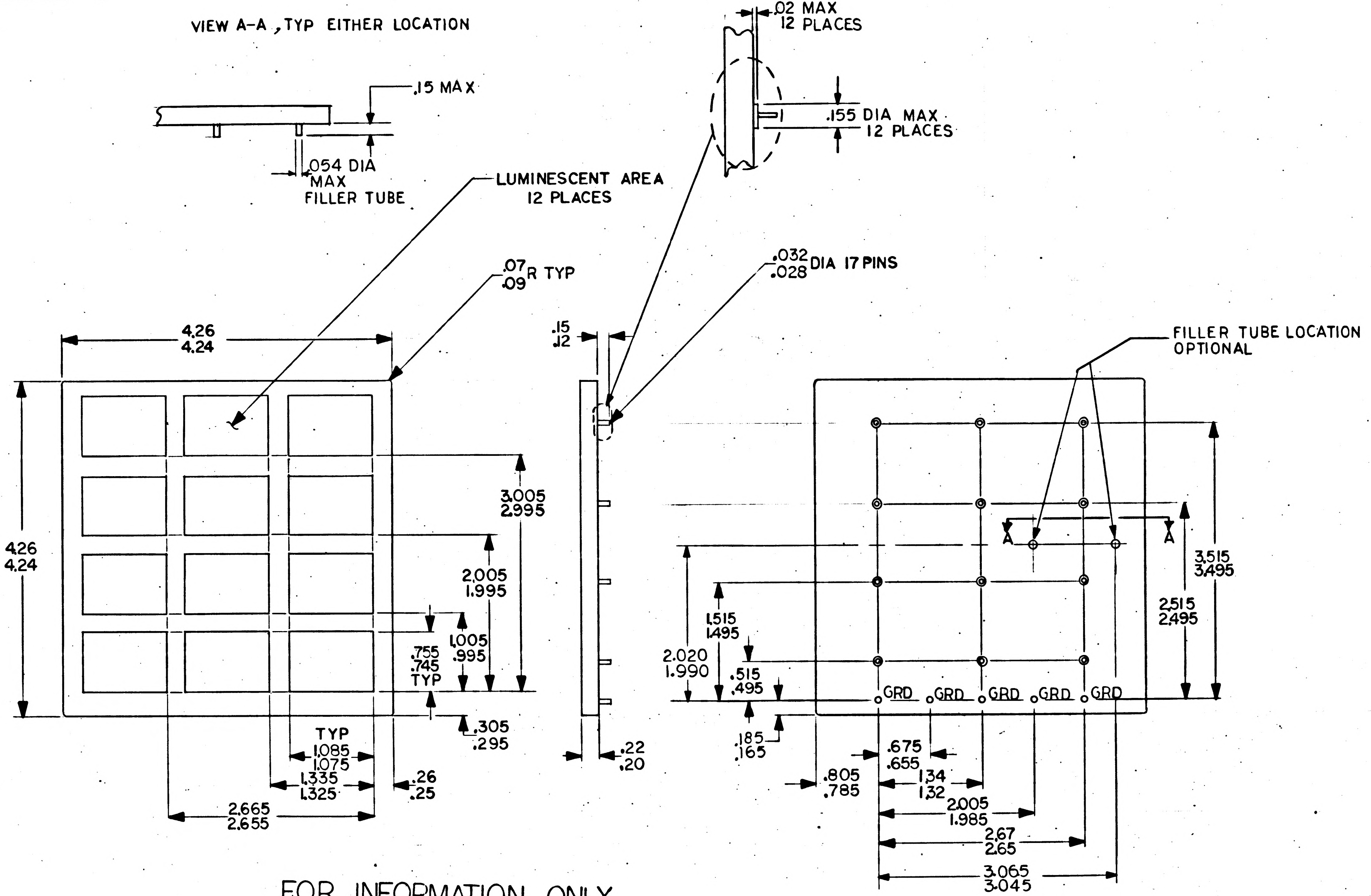
A | 1006745

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	10/21/64	


VIEW A-A, TYP EITHER LOCATION
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FILLER TUBE LOCATION OPTIONAL
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FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orifice DMS DATE 6FEB64
CHECKED J. Wolkowicz 7FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/18/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006745
SCALE NONE WT SHEET 2 OF 2

MASTER

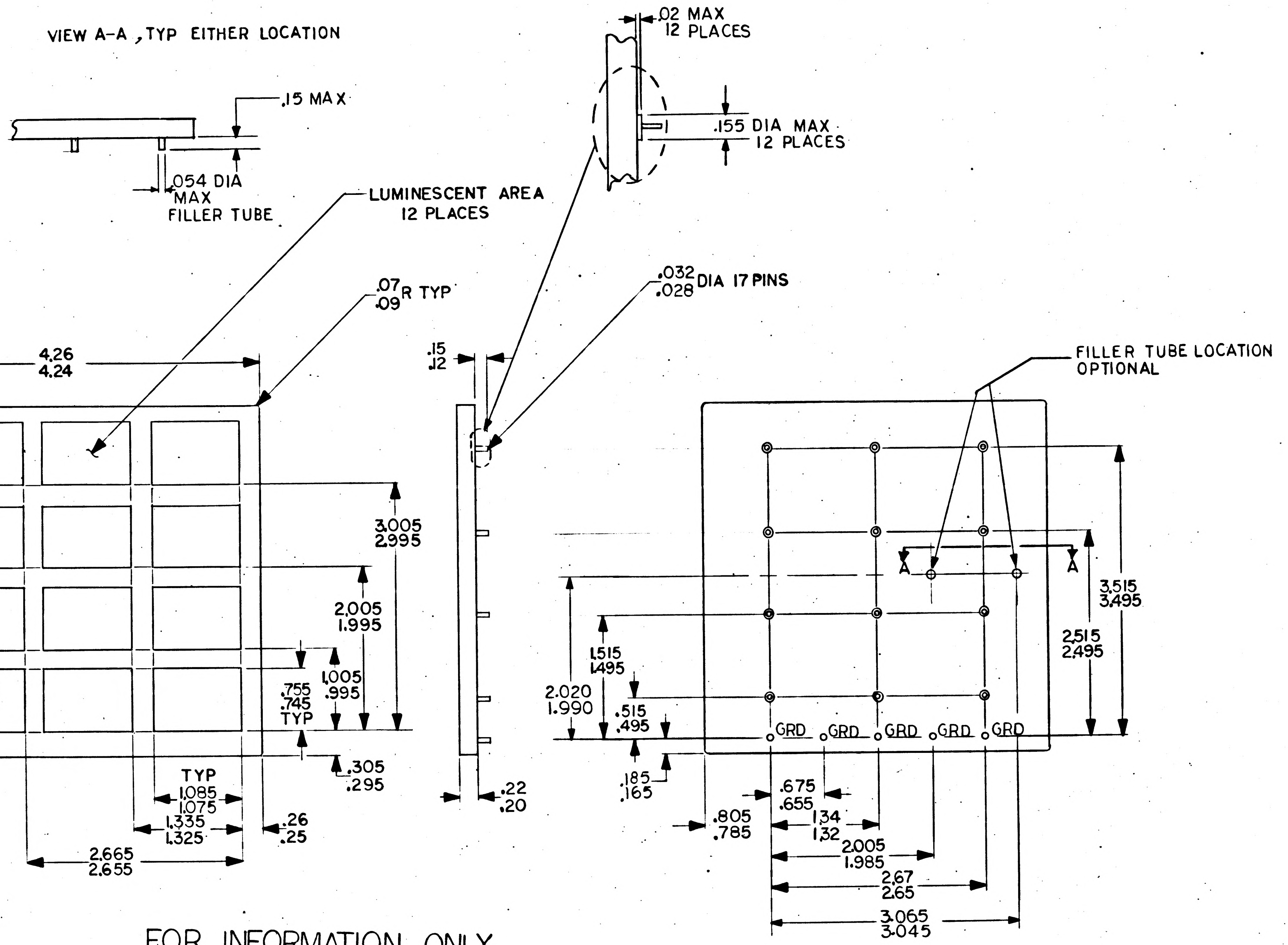
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006745 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	10/24/64	



VIEW A-A , TYP EITHER LOCATION
.15 MAX
.054 DIA MAX
FILLER TUBE
.02 MAX 12 PLACES
.155 DIA MAX 12 PLACES
LUMINESCENT AREA 12 PLACES
.07 .09 R TYP
.032 .028 DIA 17 PINS
FILLER TUBE LOCATION OPTIONAL
4.26 4.24
4.26 4.24
.15 .12
3.005 2.995
2.005 1.995
1.005 .995
.755 .745 TYP
.305 .295
TYP 1.085 1.075
1.335 1.325
2.665 2.655
.26 .25
.22 .20
A
A
3.515 3.495
2.515 2.495
1.515 1.495
2.020 1.990
.515 .495
.185 .165
GRD
GRD
GRD
GRD
GRD
.805 .785
.675 .655
.134 .132
2.005 1.985
2.67 2.65
3.065 3.045

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 6FEB64
CHECKED J. Wolkowicz 7FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL B Michael 5/15/64
MIT APPROVAL D Hoag 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006745 Ⓜ

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	[illegible]	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/26/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE GOLD PLATED MATERIAL.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) : 15.0 MA
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)
   - J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Quilico DMS DATE 6 FEB 64
CHECKED 7 FEB 64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL L Hazel 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

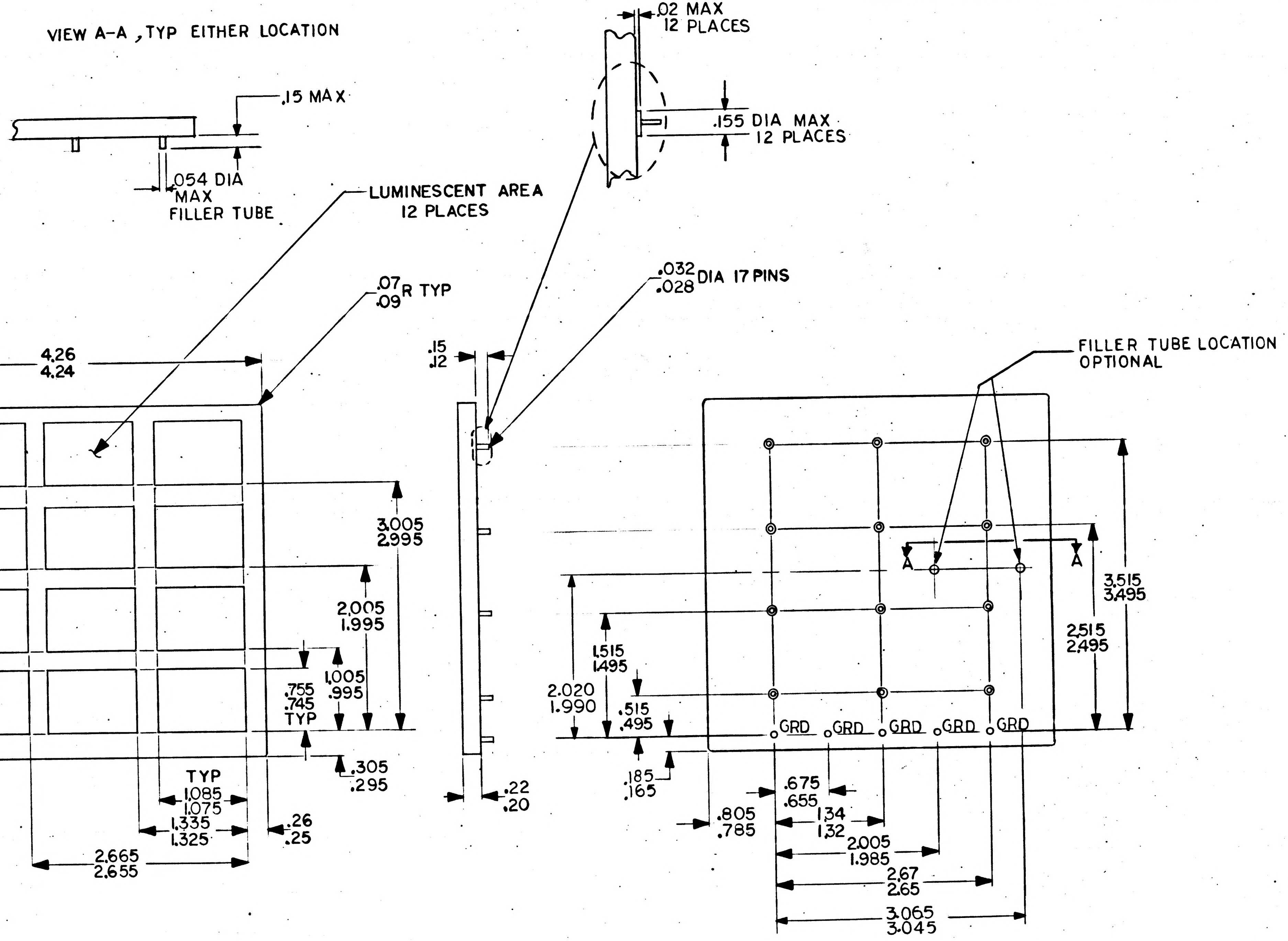
CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006745
SCALE NONE WT SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006745 Ⓜ

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	10/21/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/26/65	WH


VIEW A-A , TYP EITHER LOCATION
.15 MAX
.054 DIA MAX FILLER TUBE
.02 MAX 12 PLACES
.155 DIA MAX 12 PLACES
LUMINESCENT AREA 12 PLACES
.07 .09 R TYP
.032 .028 DIA 17 PINS
FILLER TUBE LOCATION OPTIONAL
4.26 4.24
4.26 4.24
.15 .12
3.005 2.995
2.005 1.995
1.005 .995
.755 .745 TYP
.305 .295
TYP 1.085 1.075
1.335 1.325
.26 .25
2.665 2.655
.22 .20
A
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3.515 3.495
2.515 2.495
1.515 1.495
2.020 1.990
.515 .495
.185 .165
GRD
GRD
GRD
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GRD
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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 6FEB64
CHECKED J. Wolkowicz 7FEB64
APPROVAL
APPROVAL Eldon C. Hall 15 May 64
NASA APPROVAL B. Michael 5/15/64
MIT APPROVAL D. Hoag 5/14/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 2 OF 2

MASTER

1006745

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

C 1006745 Ⓜ

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	11/24/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/14/65	WK
C	REVISED PER TDRR 19189	6-2-65	WN.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) : 15.0 MA

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)
   - J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Qilico DMS DATE 6FEB64
CHECKED 7FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/18/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

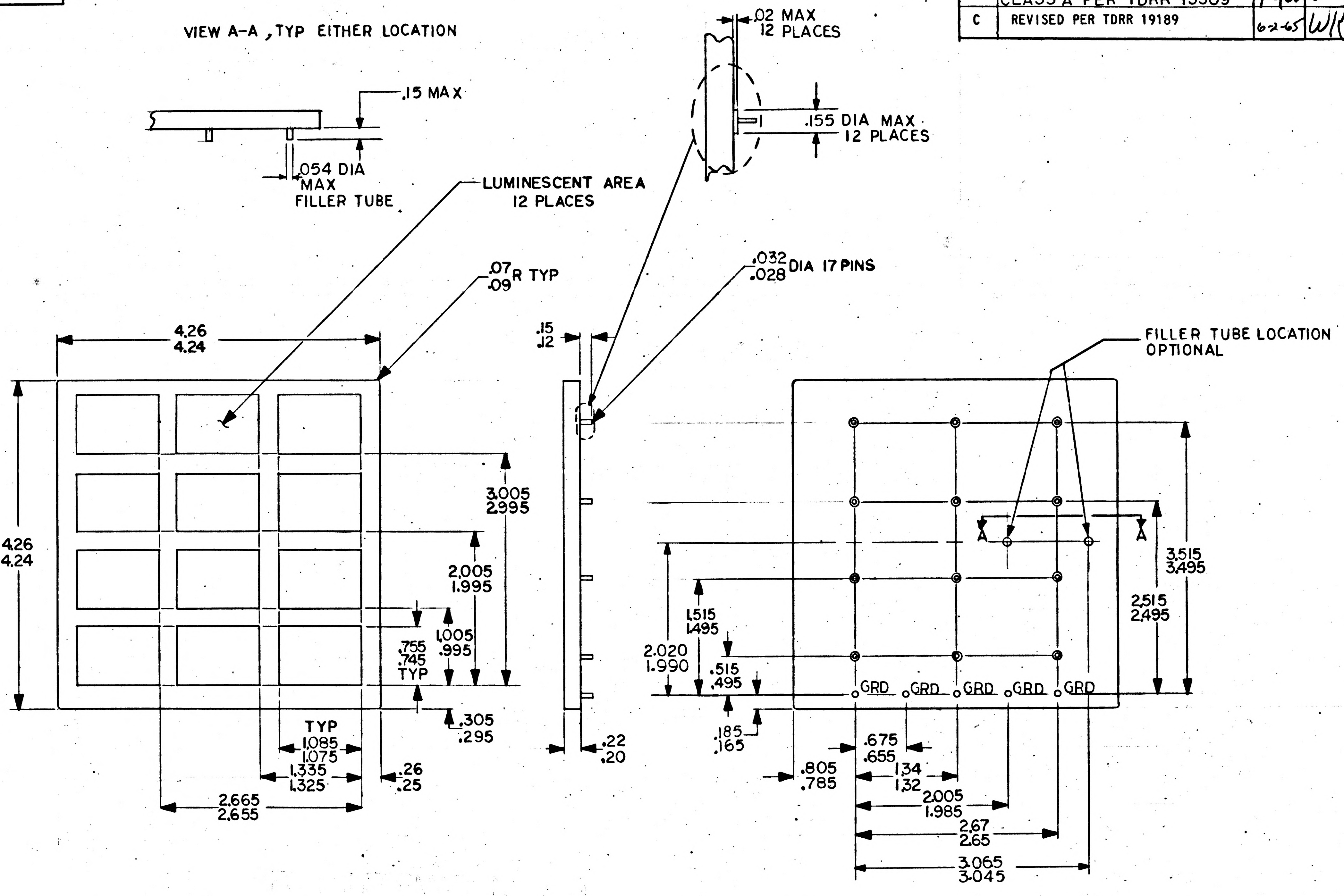
CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006745
SCALE NONE WT SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

C 1006745 Ⓜ

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	10/26/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/26/65	WR
C	REVISED PER TDRR 19189	6-2-65	WR


VIEW A-A , TYP EITHER LOCATION
.15 MAX
.054 DIA MAX FILLER TUBE
LUMINESCENT AREA 12 PLACES
.02 MAX 12 PLACES
.155 DIA MAX 12 PLACES
.07 .09 R TYP
.032 .028 DIA 17 PINS
FILLER TUBE LOCATION OPTIONAL
4.26 4.24
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3.005 2.995
2.005 1.995
1.005 .995
.755 .745 TYP
.305 .295
TYP 1.085 1.075
1.335 1.325
.26 .25
2.665 2.655
.22 .20
3.515 3.495
2.515 2.495
1.515 1.495
2.020 1.990
.515 .495
.185 .165
GRD
GRD
GRD
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GRD
.805 .785
.675 .655
1.34 1.32
2.005 1.985
2.67 2.65
3.065 3.045

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orifice DMS DATE 6FEB64
CHECKED J. Wolkowicz ?KM 7FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL B Michael 5/15/64
MIT APPROVAL D Hoag 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006745 D

REVISIONS 08550 5-19-64			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	12/22/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/26/65	WK
C	REVISED PER TDRR 19189	6-2-65	WN.
D	REVISED PER TDRR 22277	9/14	MHM

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

   E. SERIALIZE UNITS PER ND 1002023

2. ACCEPTANCE AND INSPECTION (100%)

   A. MECHANICAL PROPERTIES:

      (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.

      (3) DIMENSIONS: SHALL BE AS SHOWN.

      (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)

   B. ELECTRICAL CHARACTERISTICS:

      (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.

      (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).

      (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) : 15.0 MA

      (4) CASE-TO-ALL PINS RESISTANCE: 10 MEGOHM, MINIMUM

   F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

   G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE OPERATING FREQUENCY.

   H. LIGHT OUTPUT (WAVE-LENGTH): 5100 ANGSTROMS (NOMINAL)

   J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1), AT 25°C.

   B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.

   C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.

   D. UNITS SHALL BE HERMETICALLY SEALED.

   E. CONSTRUCTION: TO BE SPECIFIED.

TABLE I

DASH NO.	FILLER TUBE CONFIGURATION
-1	.050 MAX. DIA TUBE, SOLDER SEALED
-2	.054 MAX DIA TUBE, PINCHED, .100 MAX WIDTH AT PINCH

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT

FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Quilico DMS DATE 6FEB64
CHECKED [illegible] 7FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL [illegible] 5/19/64
MIT APPROVAL [illegible] 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 1 OF 2

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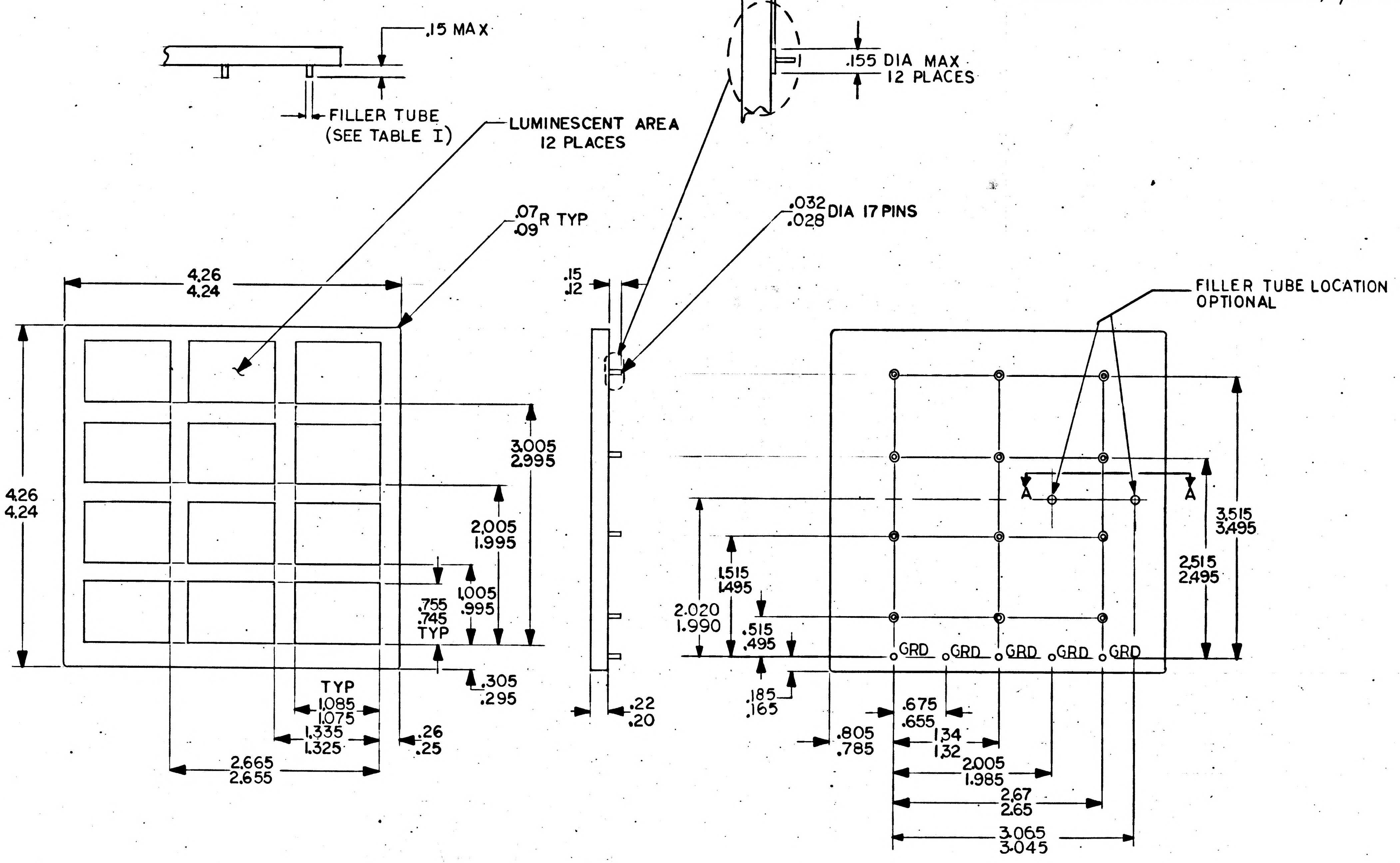
D 1006745 Ⓜ

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	10/20/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/26/65	WK
C	REVISED PER TDRR 19189	6-2-65	WK
D	REVISED PER TDRR 22277	9/14	MM

VIEW A-A, TYP EITHER LOCATION


.15 MAX
FILLER TUBE
(SEE TABLE I)
LUMINESCENT AREA
12 PLACES
.02 MAX
12 PLACES
.155 DIA MAX
12 PLACES
.07
.09 R TYP
.032
.028 DIA 17 PINS
FILLER TUBE LOCATION
OPTIONAL
4.26
4.24
4.26
4.24
3.005
2.995
2.005
1.995
1.005
.995
.755
.745
TYP
.305
.295
TYP
1.085
1.075
1.335
1.325
2.665
2.655
.26
.25
.15
.12
.22
.20
3.515
3.495
2.515
2.495
1.515
1.495
2.020
1.990
.515
.495
.185
.165
GRD
GRD
GRD
GRD
GRD
.675
.655
.805
.785
1.34
1.32
2.005
1.985
2.67
2.65
3.065
3.045

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orfice DMS DATE 6FEB64
CHECKED J. Wolkowicz RSM 7FEB64
APPROVAL
APPROVAL Eldon C. Hall 15 May 64
NASA APPROVAL 5/18/64
MIT APPROVAL D. Hoag 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

E 1006745 Ⓜ

REVISIONS 08550 5-19-64			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	6/26/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/26/65	WK
C	REVISED PER TDRR 19189	6-2-65	WK.
D	REVISED PER TDRR 22277	9/14	
E	REVISED PER TDRR 22882	11/9/66	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
   - E. SERIALIZE UNITS PER ND 1002023
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)
   - J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE. BEFORE BURN-IN: 9.5 FOOT-LAMBERTS MIN AFTER BURN-IN
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1). AFTER BURN-IN
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) : 15.0 MA AFTER BURN-IN
     - (4) CASE-TO-ALL PINS RESISTANCE: 10 MEGOHM, MINIMUM
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1), AT 25°C.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
4. SPECIAL CONDITIONING BY VENDOR (BURN-IN): UNIT SHALL BE OPERATED AT 25°C FOR A PERIOD OF 100 HOURS WHILE EXCITED PER PARA 2.B.(1) BEFORE AND AFTER READINGS OF LIGHT INTENSITY, CURRENT, AND POWER FACTOR SHALL ACCOMPANY EACH PART.

TABLE I

DASH NO.	FILLER TUBE CONFIGURATION
-1	.050 MAX. DIA TUBE, SOLDER SEALED
-2	.054 MAX DIA TUBE, PINCHED, .100 MAX WIDTH AT PINCH

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Orsilico DMS DATE 6FEB64
CHECKED 7FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/18/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006745

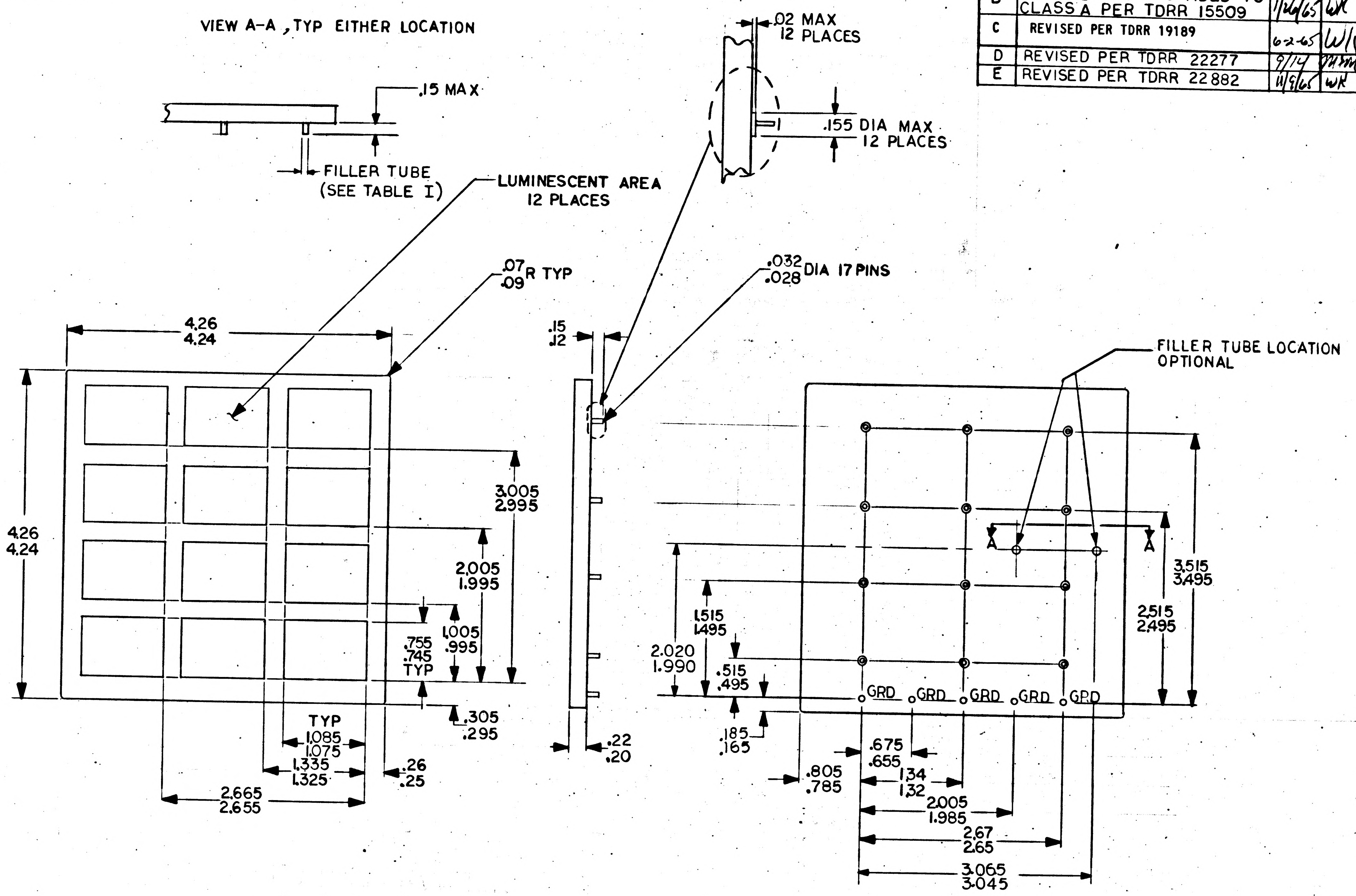
SCALE NONE | WT | SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

E 1006745 Ⓜ

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13430	10/29/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15509	1/26/65	WK
C	REVISED PER TDRR 19189	6-2-65	WK
D	REVISED PER TDRR 22277	9/14	
E	REVISED PER TDRR 22882	11/9/65	WK



VIEW A-A, TYP EITHER LOCATION
.15 MAX
FILLER TUBE (SEE TABLE I)
LUMINESCENT AREA 12 PLACES
.02 MAX 12 PLACES
.155 DIA MAX 12 PLACES
.07 .09 R TYP
.032 .028 DIA 17 PINS
4.26 4.24
4.26 4.24
3.005 2.995
2.005 1.995
1.005 .995
.755 .745 TYP
.305 .295
TYP 1.085 1.075
1.335 1.325
2.665 2.655
.26 .25
.15 .12
.22 .20
FILLER TUBE LOCATION OPTIONAL
A
A
3.515 3.495
2.515 2.495
1.515 1.495
2.020 1.990
.515 .495
.185 .165
GRD
GRD
GRD
GRD
GRD
.675 .655
.805 .785
1.34 1.32
2.005 1.985
2.67 2.65
3.065 3.045

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Onifio DMS DATE 6FEB64
CHECKED J. Wolkowicz 7FEB64
APPROVAL
APPROVAL Eldon C. Hall 15 May 64
NASA APPROVAL 5/15/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

—	1006745

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL, HERMETICALLY SEALED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1)): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

SHEET 1	SHEET 2
—	—
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S. T. [illegible] DMS DATE 6FEB64
CHECKED [illegible] 7FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL [illegible] 5/19/64
MIT APPROVAL [illegible] 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

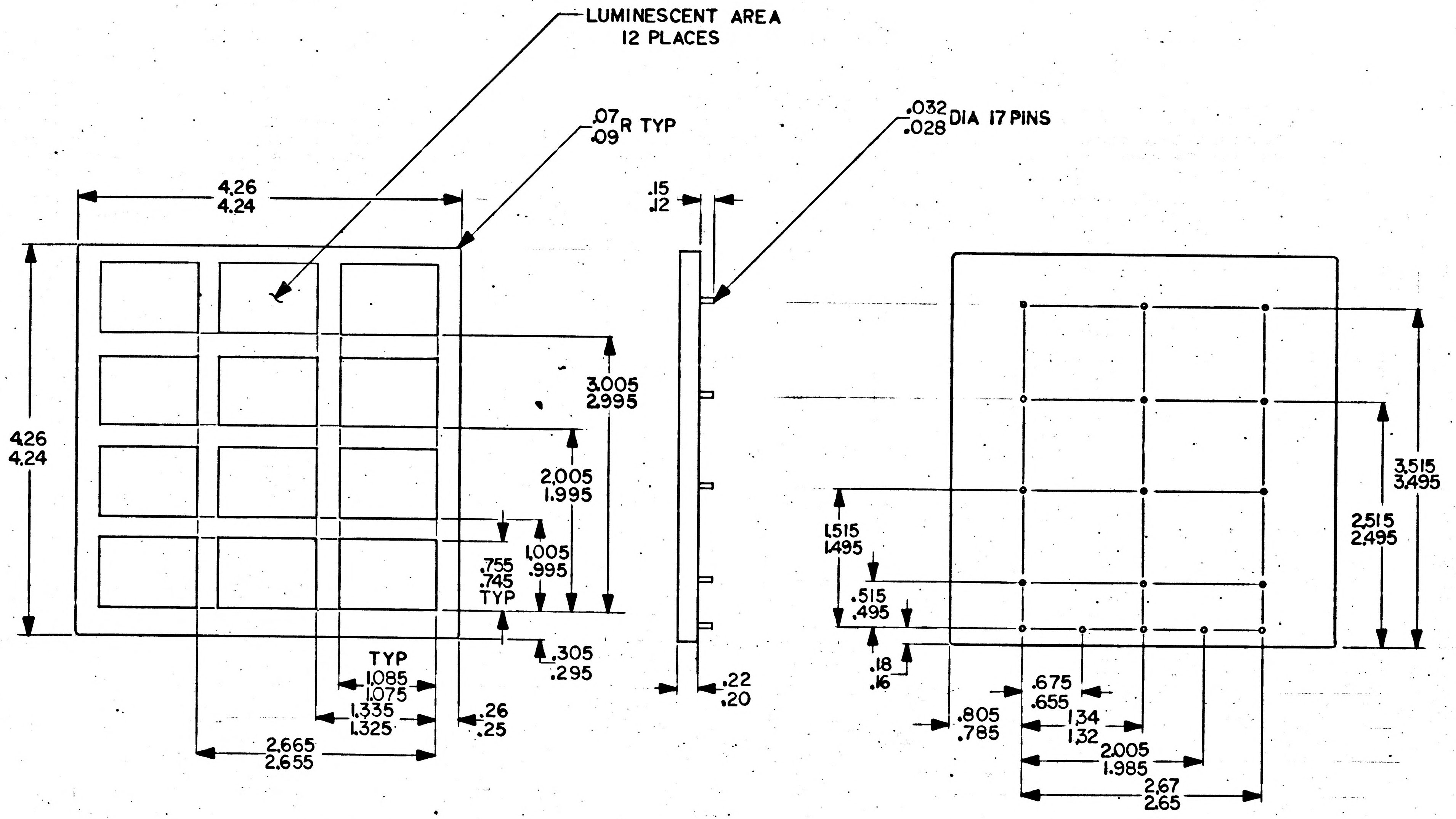
CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

–	1006745

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL


LUMINESCENT AREA
12 PLACES
.07 / .09 R TYP
.032 / .028 DIA 17 PINS
4.26 / 4.24
4.26 / 4.24
.15 / .12
3.005 / 2.995
2.005 / 1.995
1.005 / .995
.755 / .745 TYP
.305 / .295
TYP
1.085 / 1.075
1.335 / 1.325
.26 / .25
2.665 / 2.655
.22 / .20
3.515 / 3.495
2.515 / 2.495
1.515 / 1.495
.515 / .495
.18 / .16
.675 / .655
.805 / .785
1.34 / 1.32
2.005 / 1.985
2.67 / 2.65

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-64

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
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DWG. NO. CONTRACT

DRAWN S.T. Orifice DMS DATE 6 FEB 64
CHECKED J. Woltkowicz RSM 7 FEB 64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL B Michael 5/15/64
MIT APPROVAL D Hoag 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006745
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13432	11/24/64	

1006746 A

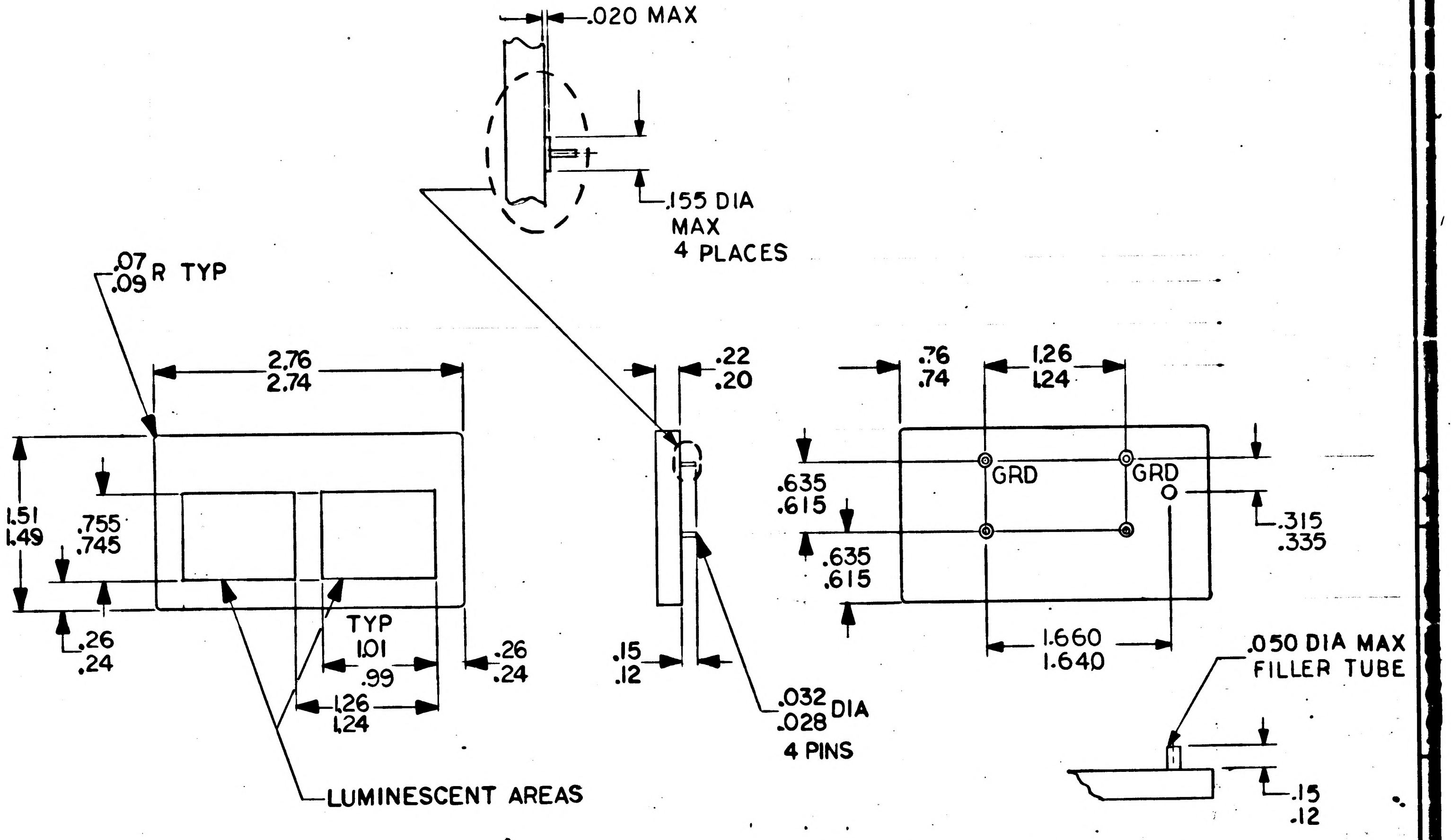
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL, HERMETICALLY SEALED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1)): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Onifico DMS DATE 7FEB64
CHECKED J. Wolkowitz HSM 10FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL 5/29/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM II)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006746
SCALE NONE
WT
SHEET 1 OF 1

4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B 1006746

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13432	[illegible]	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15508	1/26/65	WR

REVISIONS 08550 5-19-64

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

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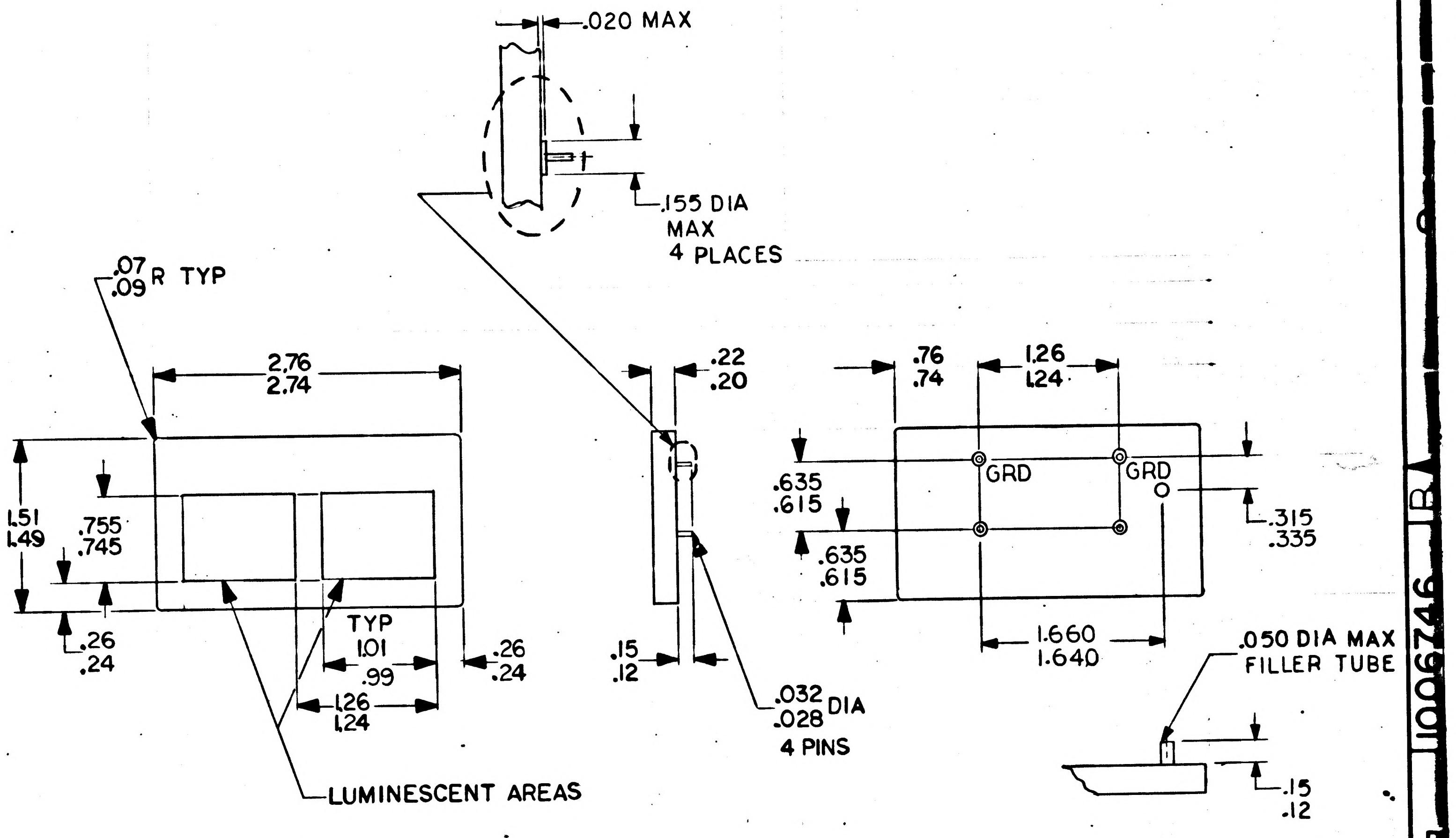
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE GOLD PLATED MATERIAL.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) 2.0 MA.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)
   - J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 7FEB 64
CHECKED F. Wolkow 10 FEB 64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL R Hazel 5/29/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM II)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006746
SCALE NONE WT SHEET 1 OF 1

1006746 B

4 3 2 1

1006746 - C

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS 08550 5-19-64			
A	REVISED PER TDRR 13432		
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15508	1/26/65	WR
C	REVISED PER TDRR 18024		WR

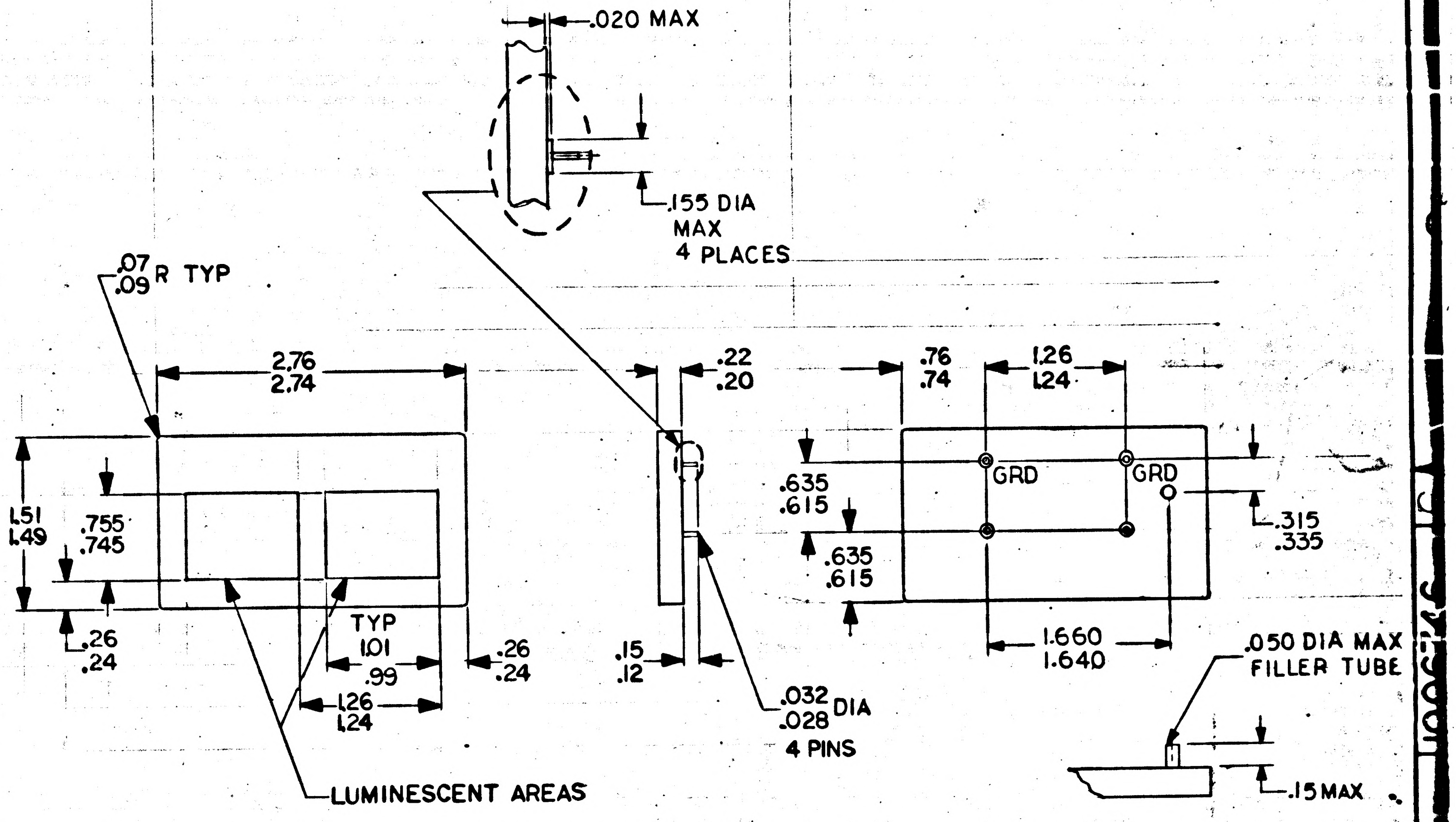
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, , PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE GOLD PLATED MATERIAL.
     - (2)
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) 2.0 MA.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)
   - J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.



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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 7FEB64
CHECKED F. Wolkowitz HSM 10FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL 5/29/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM II)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006746
SCALE NONE
WT
SHEET 1 OF 1

4 3 2 1

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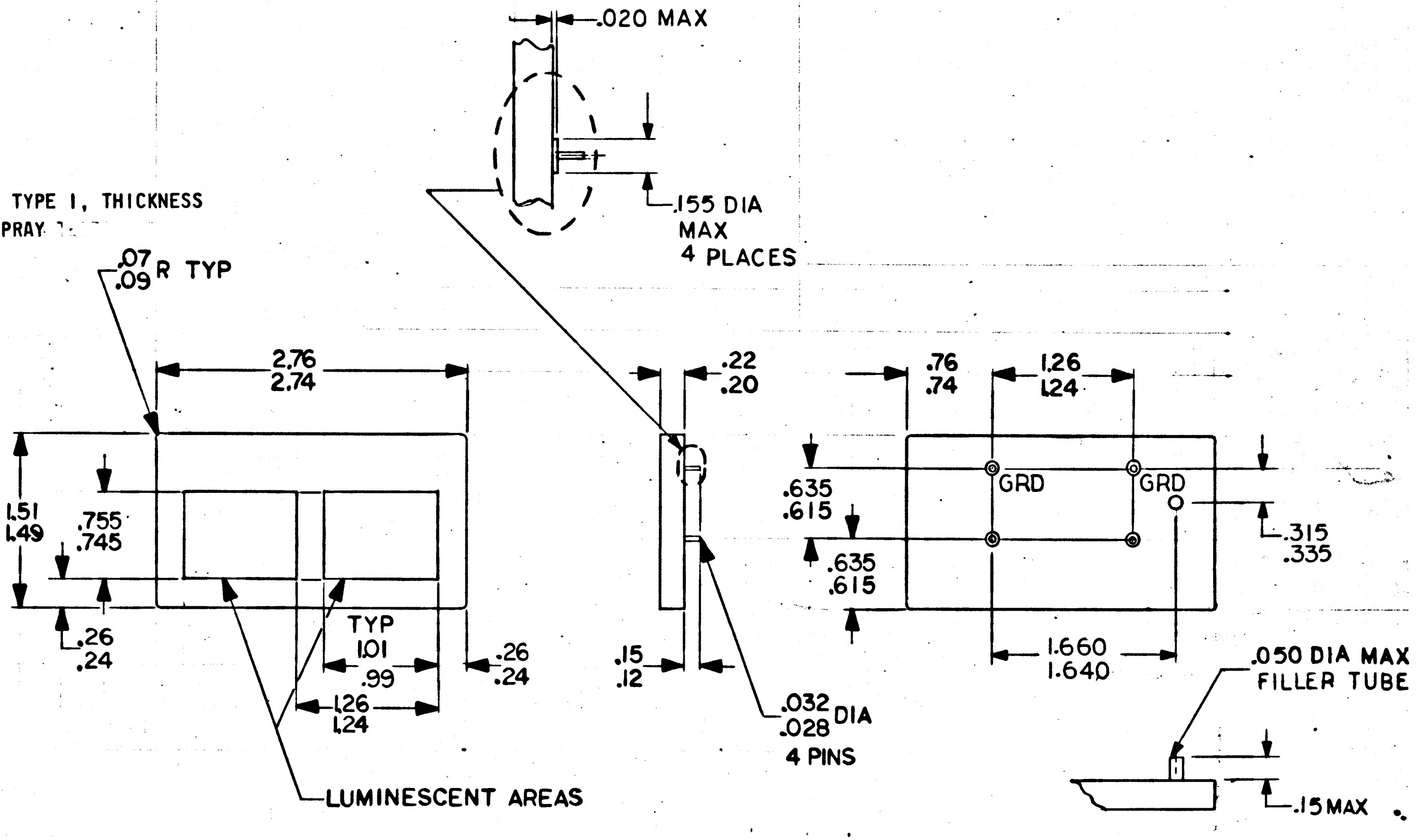
REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13432	11/24/64	[illegible]
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15508	1/26/65	WK
C	REVISED PER TDRR 18024		WK
D	REVISED PER TDRR 19188	5/26/65	WK.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, , PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)
   - J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) 2.0 MA.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT
DRAWN S.T. Quifica DMS DATE 7 FEB 64
CHECKED J. Wolkowitz HBM 10 FEB 64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL [illegible] 5/19/64
MIT APPROVAL [illegible] 5/29/64

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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM II)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 | SIZE C | NASA DRAWING NO. 1006746
SCALE NONE | WT | SHEET 1 OF 1

1006746 E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 08550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13432	11/24/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15508	1/26/65	WK
C	REVISED PER TDRR 18024		WK
D	REVISED PER TDRR 19188	5/26/65	WK.
E	REVISED PER TDRR 22278	9/28/66	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, , PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002056.
   - E. SERIALIZE UNITS PER ND1002023
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE I, THICKNESS 0.0001 MINIMUM: 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 14 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL CURRENT (ALL UNITS ENERGIZED PER 2.B.(1)) 2.0 MA.
     - (4) CASE-TO-ALL PINS RESISTANCE: 1.0 MEGOHM, MINIMUM
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)
   - J. LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1). AT 25°C
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.

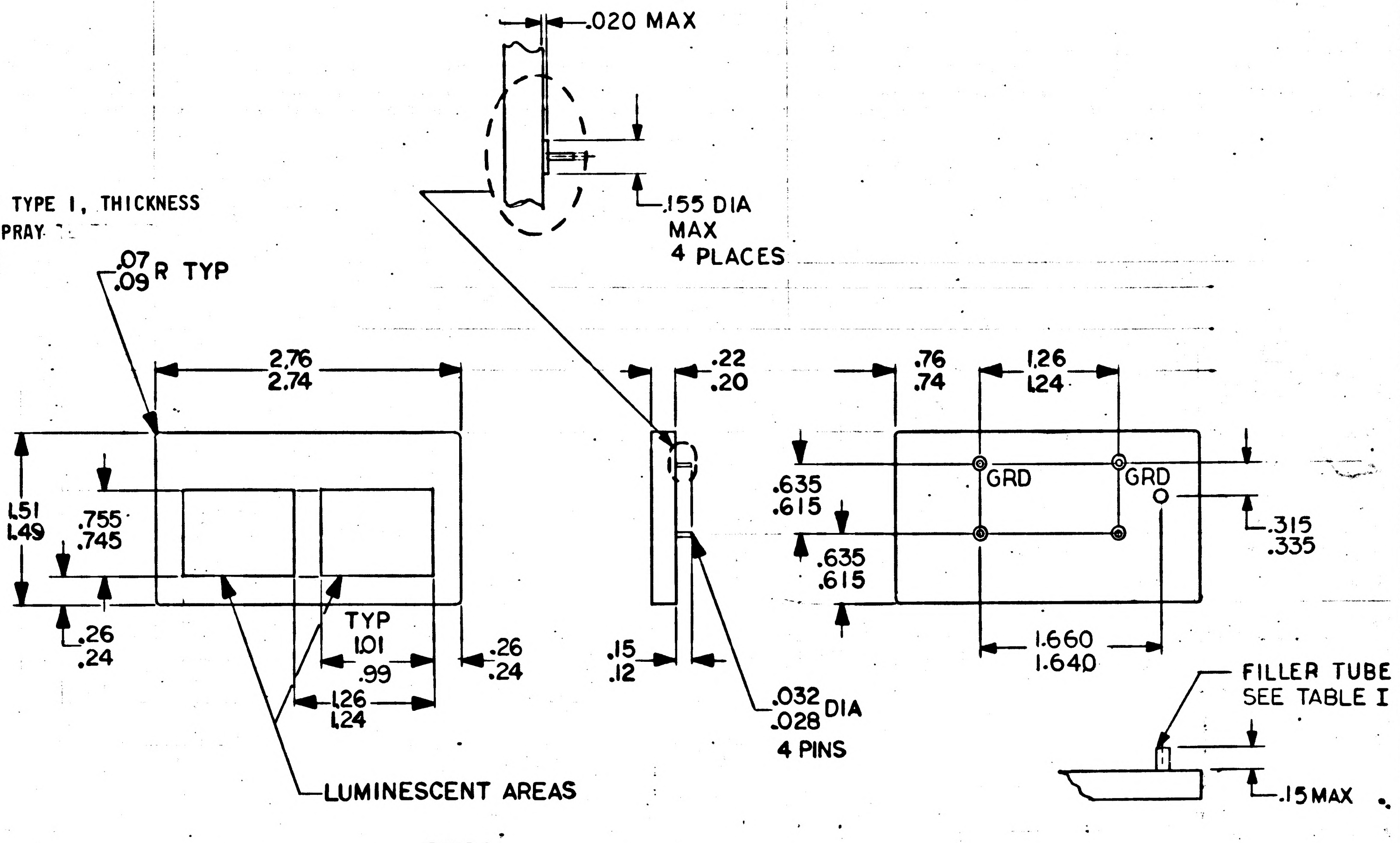

TABLE I

DASH NO.	FILLER TUBE CONFIGURATION
-1	.050 MAX DIA TUBE, SOLDER SEALED
-2	.054 MAX DIA TUBE, PINCHED, .100 WIDTH AT PINCH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT
DRAWN S.T. Quifica DMS DATE 7FEB64
CHECKED F. W. Kourtz HBM 10FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/19/64
MIT APPROVAL 5/29/64

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INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (ALARM II)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006746
SCALE NONE
WT
SHEET 1 OF 1

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1006746 | —

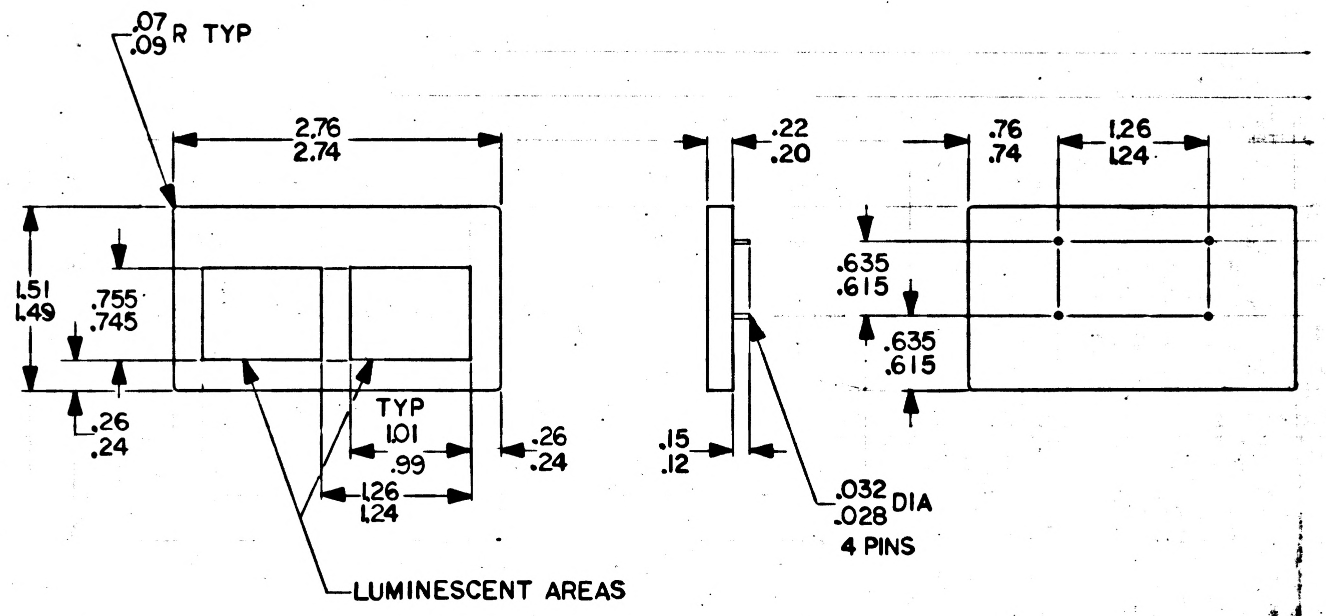
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, POWER REQUIREMENTS, PLUS THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). CONTAINERS SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, AND THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SHALL BE A SOLDERABLE PLATED MATERIAL, HERMETICALLY SEALED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) DIMENSIONS: SHALL BE AS SHOWN.
     - (4) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810)
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 17 FOOT LAMBERTS MINIMUM WHEN EXCITED BY 250 ± 25 VRMS AT 800 ± 10 CPS SINE WAVE.
     - (2) POWER FACTOR: 0.25 MAXIMUM WHEN EXCITED PER 2.B.(1).
     - (3) TOTAL POWER CONSUMPTION (ALL UNITS ENERGIZED PER 2.B.(1)): TO BE SPECIFIED.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1).
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED.
   - E. CONSTRUCTION: TO BE SPECIFIED.
   - F. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - G. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - H. LIGHT OUTPUT (WAVE LENGTH): 5100 ANGSTROMS (NOMINAL)



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 08550 DATE 5-19-

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Quilica DMS DATE 7FEB64
CHECKED J. Wolkowitz HSM 10FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL [illegible] 5/19/64
MIT APPROVAL [illegible] 5/29/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY,
ELECTROLUMINESCENT (ALARM II)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006746
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006750 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63	

(M)

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   B. EXCEPTIONS:

      (1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

      (2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

      (3) TEMPERATURE COEFFECIENT:

      ± 200P.P.M/°C MAX FROM -55°C TO 150°C.

      (4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

      (5) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE LETTER G INDICATING PLUS OR MINUS 2 PERCENT RESISTANCE TOLERANCE.

   C. ADDITIONS:

      (1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

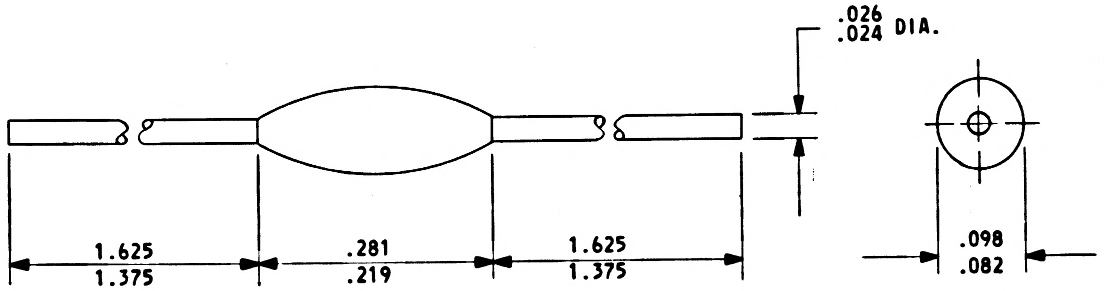
      (2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

         A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ± 2 SIGMA.

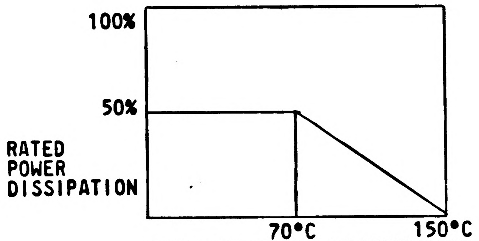
         B) ANY PART WHICH CHANGES MORE THAN 0.75%.

         C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

   D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	85
18		14	38	62	86
20		15	39	63	87
22		16	40	64	88
24		17	41	65	89
27		18	42	66	90
30		19	43	67	91
33		20	44	68	92
36		21	45	69	93
39		22	46	70	94
43		23	47	71	95
47		24	48	72	96
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	



DESIGN APPLICATION DERATING CURVE

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED George J Price 17 Jan 63
APPROVAL 1-18/63
APPROVAL
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

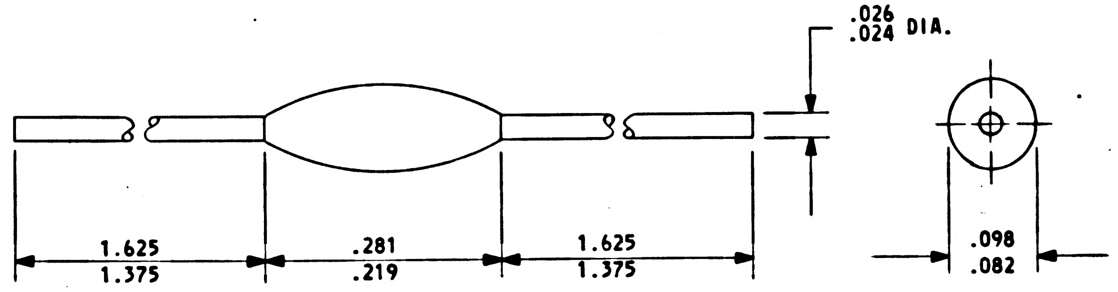
CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
(M) A	REVISED & RECRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63	
B	REVISED PER TDRR 00401	2-7-63	WJC

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - B. EXCEPTIONS:
     - (1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.
     - (2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.
     - (3) TEMPERATURE COEFFECIENT:
       ± 200P.P.M/°C MAX FROM -55°C TO 150°C.
     - (4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.
     - (5) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE LETTER G INDICATING PLUS OR MINUS 2 PERCENT RESISTANCE TOLERANCE.
   - C. ADDITIONS:
     - (1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.
     - (2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:
       - A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ± 2 SIGMA.
       - B) ANY PART WHICH CHANGES MORE THAN 0.75%.
       - C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.
   - D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
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24		17	41	65	
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39		22	46	70	
43		23	47	71	
47		24	48	72	
51	1	25	49	73	
56	2	26	50	74	
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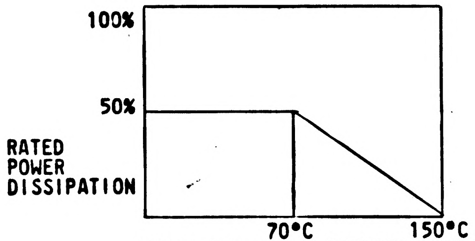
91	7	31	55	79	



DESIGN APPLICATION DERATING CURVE

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED [illegible] 17 Jan 63
APPROVAL [illegible] 1-18/63
APPROVAL
NASA APPROVAL W J [illegible] 1-23-63
MIT APPROVAL [illegible] 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006750 C

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63		
B	REVISED PER TDRR 00401	2-7-63		WK
C	CHANGE PER TDRR 02593	8/14/63		WK

NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:

± 200P.P.M/°C MAX FROM -55°C TO 150°C.

(4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

(5) MARKING: RESISTORS SHALL BE LEGIBLY AND PERMANENTLY COLOR CODED IN ACCORDANCE WITH MIL-STD-221. TWO PERCENT RESISTANCE TOLERANCE SHALL BE MARKED WITH A RED COLOR BAND. PACKAGE SHALL BE LEGIBLY MARKED PER MIL-STD-129 WITH MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, NASA DRAWING NUMBER AND REVISION LETTER.

C. ADDITIONS:

(1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

(2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ± 2 SIGMA.

B) ANY PART WHICH CHANGES MORE THAN 0.75%.

C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
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24		17	41	65	
27		18	42	66	
30		19	43	67	
33		20	44	68	
36		21	45	69	
39		22	46	70	
43		23	47	71	
47		24	48	72	
51	1	25	49	73	
56	2	26	50	74	
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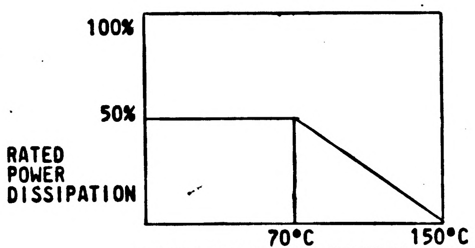
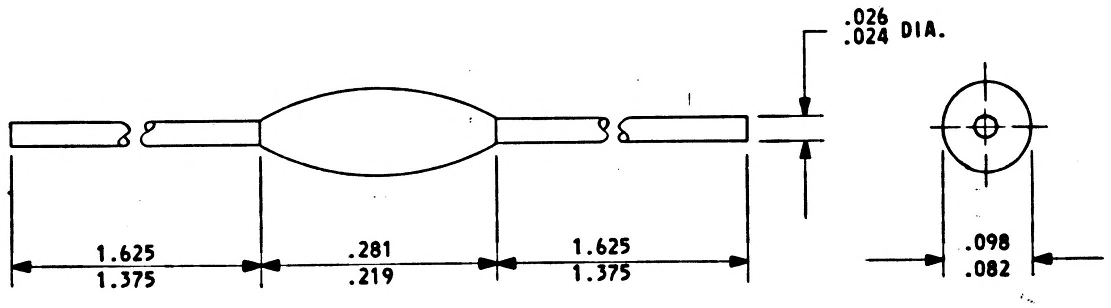
91	7	31	55	79	



DESIGN APPLICATION DERATING CURVE



PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED [illegible] 17 Jan 63
APPROVAL [illegible] 1-18/63
APPROVAL
NASA APPROVAL W J [illegible] 1-23-63
MIT APPROVAL [illegible] 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006750 D

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63		
B	REVISED PER TDRR 00401	2-7-63		WK
C	CHANGE PER TDRR 02593	8/14/63		WK
D	REVISED PER TDRR 04179	10/30/63	WK	

NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:

± 200P.P.M/°C MAX FROM -55°C TO 150°C.

(4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

(5) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE, LETTER G INDICATING ± 2% RESISTANCE TOLERANCE, AND THE MANUFACTURER'S FOUR-DIGIT MANUFACTURING LOT NUMBER.

C. ADDITIONS:

(1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

(2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ± 2 SIGMA.

B) ANY PART WHICH CHANGES MORE THAN 0.75%.

C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
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13		11	35	59	83
15		12	36	60	84
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33		20	44	68	
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39		22	46	70	
43		23	47	71	
47		24	48	72	
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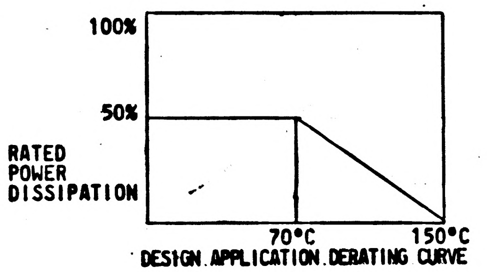
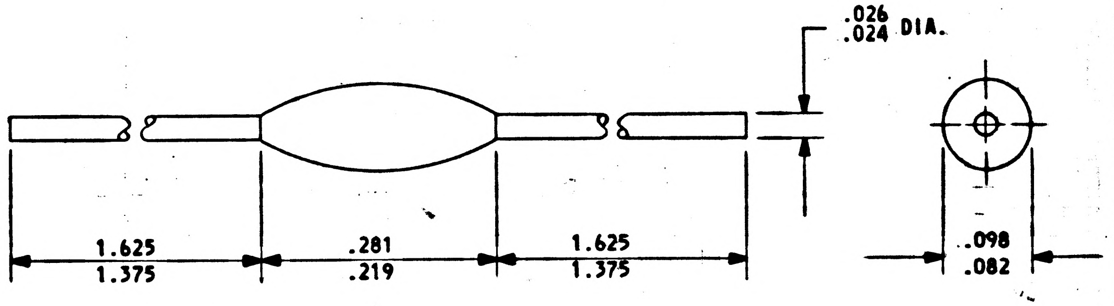
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	



DESIGN APPLICATION DERATING CURVE



PURCHASE TO QUALIFICATION STATUS LIST ND1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED 17 Jan 63
APPROVAL 1-18/63
APPROVAL
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM
INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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E 1006750

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63		
B	REVISED PER TDRR 00401	2-7-63		WK
C	CHANGE PER TDRR 02593	8/14/63		1. W
D	REVISED PER TDRR 04179	10/30/63	WK	
E	REVISED PER TDRR 06008	-	WK.	

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   B. EXCEPTIONS:

      (1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

      (2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

      (3) TEMPERATURE COEFFECIENT:

      ± 200P.P.M/°C MAX FROM -55°C TO 150°C.

      (4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

      (5) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND1002019 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE, LETTER G INDICATING ± 2% RESISTANCE TOLERANCE, AND THE MANUFACTURER'S FOUR-DIGIT MANUFACTURING LOT NUMBER.

   C. ADDITIONS:

      (1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

      (2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

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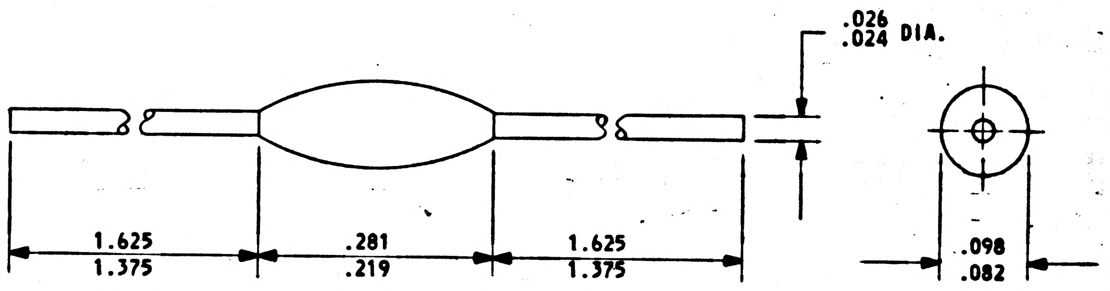
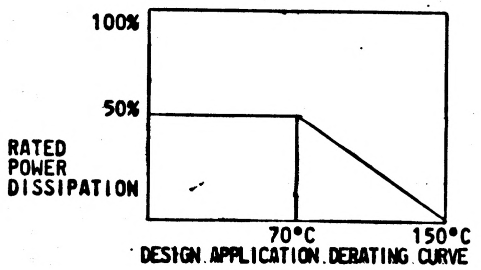
   D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	



DESIGN APPLICATION DERATING CURVE

MASTER

PURCHASE TO QUALIFICATION STATUS LIST ND1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
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FINAL FINISH —

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED George J Price 17 Jan 63
APPROVAL 1-18/63
APPROVAL
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL 13 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM
INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 1 OF 2

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1006750 E

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED PER TDRR 06008		

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
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47		24	48	72	
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	
10.5		92	116	140	164
11.5		93	117	141	165
12.5		94	118	142	166
14.		95	119	143	167
15.5		96	120	144	
17		97	121	145	
19		98	122	146	
21		99	123	147	
23		100	124	148	
25.5		101	125	149	

BASIC RESISTANCE VALUE OHMS	MULTIPLIER & DASH NO.				
	1	10	10^2	10^3	10^4
28.5		102	126	150	
31.5		103	127	151	
34.5		104	128	152	
37.5		105	129	153	
41		106	130	154	
45		107	131	155	
49		108	132	156	
53.5	85	109	133	157	
59	86	110	134	158	
65	87	111	135	159	
71.5	88	112	136	160	
78.5	89	113	137	161	
86.5	90	114	138	162	
95.5	91	115	139	163	

Ⓔ THIS SHEET ADDED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C.P. Kryzaniwsky DATE 2-4-64
CHECKED A. M. 2-4-64
APPROVAL
APPROVAL Eldon C Hall 2/4/64
NASA APPROVAL 2/4/64
MIT APPROVAL 4 Feb 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006750 F

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63		
B	REVISED PER TDRR 00401	3-7-63		WK
C	CHANGE PER TDRR 02593	8/14/63		WK
D	REVISED PER TDRR 04179	10/30/63	WK	
E	REVISED PER TDRR 06008	-	WK	
F	REVISED PER TDRR 06248	2-18-64	WK	

NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE NICKEL LEADS PER PS 1015400. LEADS SHALL ALSO BE GOLD FLASHED PER PS 1015400 UNLESS OTHERWISE SPECIFIED. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:

± 200P.P.M/°C MAX FROM -55°C TO 150°C.

(4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

(5) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND1002019 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE, LETTER G INDICATING ± 2% RESISTANCE TOLERANCE, AND THE MANUFACTURER'S FOUR-DIGIT MANUFACTURING LOT NUMBER.

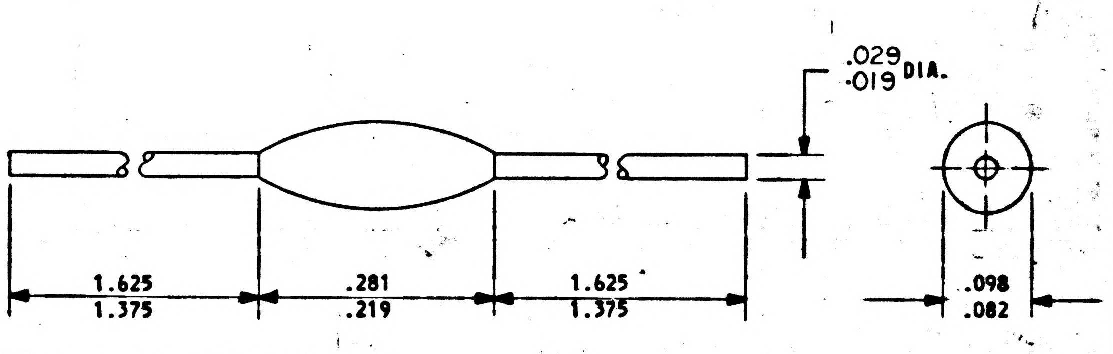
C. ADDITIONS:

(1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I

(2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

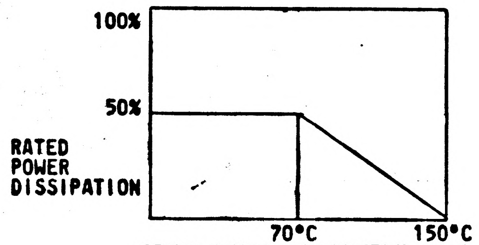
A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ± 2 SIGMA.
B) ANY PART WHICH CHANGES MORE THAN 0.75%.
C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



F	E
E	E
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS



DESIGN APPLICATION DERATING CURVE

MASTER

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED 17 Jan 63
APPROVAL 1-18/63
APPROVAL
NASA APPROVAL W J 1-23-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 1 OF 2

4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63		
B	REVISED PER TDRR 00401	2-7-63		WK
C	CHANGE PER TDRR 02593	8/14/63		WK
D	REVISED PER TDRR 04179	10/30/63	WK	
E	REVISED PER TDRR 06008	-	WK	
F	REVISED PER TDRR 06248	2-18-64	WK	
G	REVISED PER TDRR 07026	3/17/64		WK

NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE NICKEL LEADS PER PS 1015400. LEADS SHALL ~~ALSO BE GOLD~~ FLASHED PER PS 1015400 UNLESS OTHERWISE SPECIFIED. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:

± 200P.P.M/°C MAX FROM -55°C TO 150°C.

(4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ~~ENERGIZED AS SHOWN IN DESIGN APPLICATION~~ DERATING CURVE BELOW.

(5) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND1002019 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE, LETTER G INDICATING ± 2% RESISTANCE TOLERANCE, AND THE MANUFACTURER'S FOUR-DIGIT MANUFACTURING LOT NUMBER.

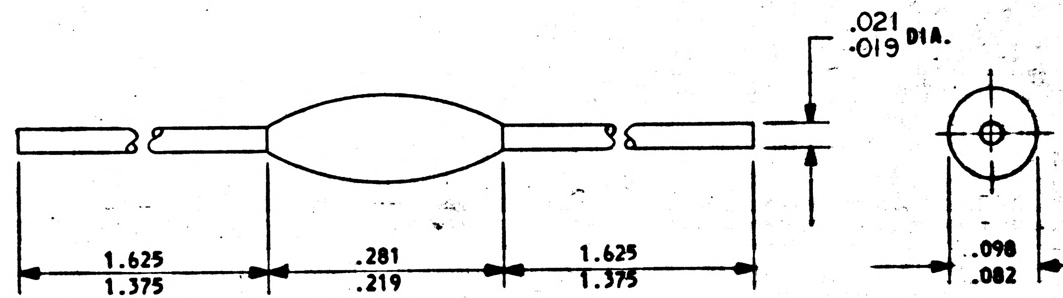
C. ADDITIONS:

(1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

(2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

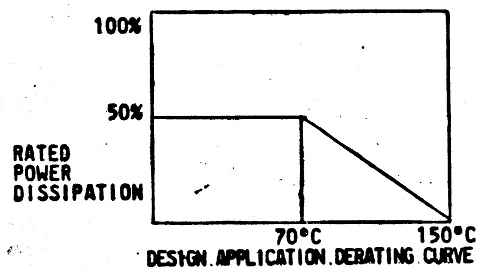
A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ± 2 SIGMA.
B) ANY PART WHICH CHANGES MORE THAN 0.75%.
C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



G	E
F	E
E	E
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS



DESIGN APPLICATION DERATING CURVE

MASTER

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

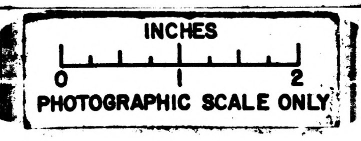
MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED George J. Pace 17 Jan 63
APPROVAL 1-18/63
APPROVAL
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL W Kupfer 3 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006750
SCALE — WT SHEET 1 OF 2



4 3 2 1

H 1006750

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00287 UPGRADED TO CLASS A RELEASE	1-18-63		
B	REVISED PER TDRR 00401	2-7-63		WK
C	CHANGE PER TDRR 02593	8/14/63		WK
D	REVISED PER TDRR 04179	10/30/63	WK	
E	REVISED PER TDRR 06008	-	WK	
F	REVISED PER TDRR 06248	2-18-64	WK	
G	REVISED PER TDRR 07026	3/17/64		WK
H	REVISED PER TDRR 16368	2/17/65	WK	

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NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE NICKEL LEADS PER PS 1015400. LEADS SHALL ALSO BE GOLD FLASHED PER PS 1015400 UNLESS OTHERWISE SPECIFIED. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:

± 200P.P.M/°C MAX FROM -55°C TO 150°C.

(4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ± 5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

(5) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND1002019 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE, LETTER G INDICATING ± 2% RESISTANCE TOLERANCE, AND THE MANUFACTURER'S FOUR-DIGIT MANUFACTURING LOT NUMBER.

C. ADDITIONS:

(1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

(2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

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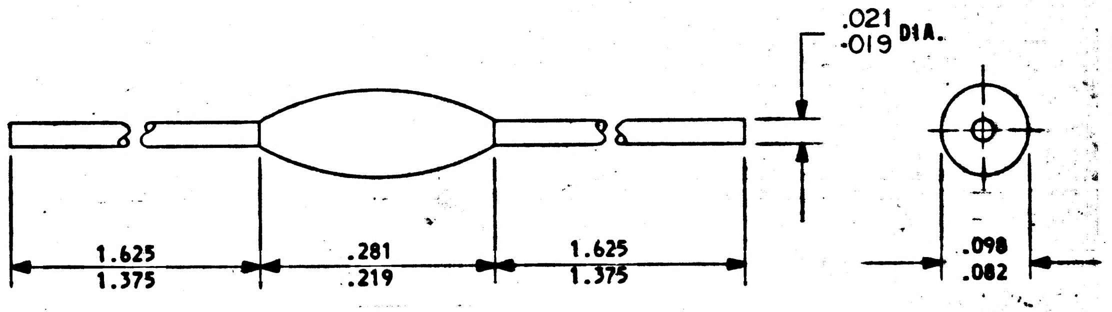
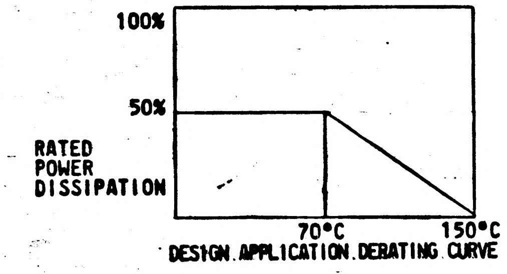
C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.





DESIGN APPLICATION DERATING CURVE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED George J. Price 17 Jan 63
APPROVAL 1-18/63
APPROVAL
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL W. Hoffer 18 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM
INSULATED 1/4 WATT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 1 OF 2

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

4 3 2 1

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H 1006750

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED PER TDRR 06008		
H	REVISED PER TDRR 16368	2/17/65	

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	
18		14	38	62	
20		15	39	63	
22		16	40	64	
24		17	41	65	
27		18	42	66	
30		19	43	67	
33		20	44	68	
36		21	45	69	
39		22	46	70	
43		23	47	71	
47		24	48	72	
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	
10.5		92	116	140	164
11.5		93	117	141	165
12.5		94	118	142	166
14.		95	119	143	167
15.5		96	120	144	
17		97	121	145	
19		98	122	146	
21		99	123	147	
23		100	124	148	
25.5		101	125	149	

BASIC RESISTANCE VALUE OHMS	MULTIPLIER & DASH NO.				
	1	10	10^2	10^3	10^4
28.5		102	126	150	
31.5		103	127	151	
34.5		104	128	152	
37.5		105	129	153	
41		106	130	154	
45		107	131	155	
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71.5	88	112	136	160	
78.5	89	113	137	161	
86.5	90	114	138	162	
95.5	91	115	139	163	
13.5		168	170	172	174
14.5		169	171	173	175

Ⓔ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT —

FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE
CHECKED 2-4-64
APPROVAL
APPROVAL 2/4/64
NASA APPROVAL 2/4/64
MIT APPROVAL 4 Feb 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM
INSULATED 1/4 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006750
SCALE —
WT
SHEET 2 OF 2

MASTER

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1006750

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. REQUIREMENTS:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL07 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   B. EXCEPTIONS:

      (1) PURCHASE TOLERANCE SHALL BE PLUS OR MINUS 1 PERCENT OF NOMINAL SPECIFIED VALUE.

      (2) UNITS SHALL HAVE WELDABLE DUMET LEADS WITH GOLD COATING PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (3) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE LETTER F INDICATING PLUS OR MINUS 1 PERCENT RESISTANCE TOLERANCE.

      (4) QUALIFICATION TESTING SHALL NOT BE REQUIRED.

      (5) LOAD LIFE TOLERANCE SHALL BE PLUS OR MINUS 4 PERCENT OF THE NOMINAL SPECIFIED VALUE.

   C. ADDITIONS:

      (1) QUALITY ASSURANCE PER NASA DOCUMENT PS 1015404 SECTION I SHALL APPLY.

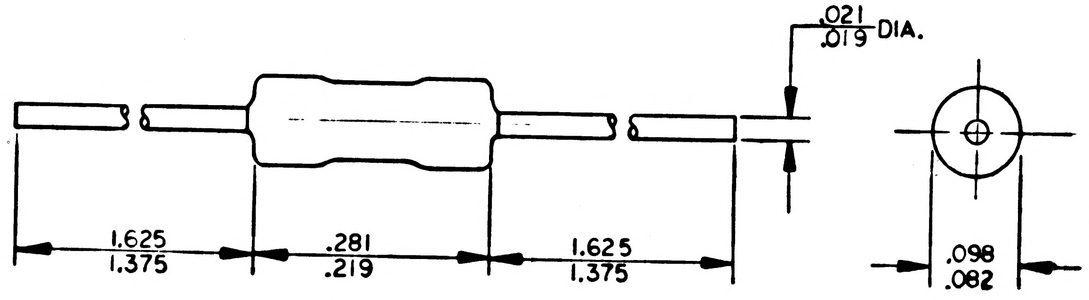
      (2) UNITS SHALL BE CAPABLE OF WITHSTANDING THE ENVIRONMENTAL REQUIREMENTS OF NASA DOCUMENT ND 1002000.

2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	BUWEPS DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	
18		14	38	62	
20		15	39	63	
22		16	40	64	
24		17	41	65	
27		18	42	66	
30		19	43	67	
33		20	44	68	
36		21	45	69	
39		22	46	70	
43		23	47	71	
47		24	48	72	
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	



ORIGINAL SOURCE OF SUPPLY:

CORNING GLASS WORKS
BRADFORD, PENNSYLVANIA
CODE IDENT NO. 07115
TYPE C07

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT #
FINAL FINISH #

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN F.R.WALKER DATE 9-13-62
CHECKED 21 Nov 62
APPROVAL Eldon C Hall 21 Nov 62
APPROVAL
NASA APPROVAL
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED FILM INSULATED 1/4 WATT, 1%

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006750
SCALE NONE
WT #
SHEET OF

1006750

1006751

SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 3 PER TDRR 00433	2-20-63	WB WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. REQUIREMENTS:

   A. ENCAPSULATION: GLASS. UNITS SHALL BE HERMETICALLY SEALED.

   B. LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY, COPPER CLAD, GOLD PLATED IN ACCORDANCE WITH NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

   C. SHALL WITHSTAND A THERMAL SHOCK OF 300°C FROM 0°C WITHIN 30 SECONDS AND BE RETURNED TO ROOM AMBIENT WITHOUT AFFECTING OPERATING CHARACTERISTICS AS SPECIFIED HEREIN, IN ADDITION TO THE REQUIREMENTS OF ND 1002000.

   D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF NASA DOCUMENT 1015404 SECTION II.

   E. UNITS SHALL BE 100 PERCENT INSPECTED FOR COMPLIANCE WITH THE REQUIREMENTS IN TABLE I UNLESS OTHERWISE SPECIFIED.

   F. TRANSIENT RESPONSE: USING A TECHTRONIX TYPE S PLUG-IN UNIT AND I_F = 5 MILLIAMPERES AND I_R = 100 MICROAMPERES, THE MEASURED TIME MUST BE LESS THAN .5 MICROSECOND. THE SLOPE OF THAT PORTION OF THE DISCHARGE CURVE CORRESPONDING TO LINEAR CAPACITANCE SHALL BE GREATER THAN .5 VOLTS AND .2 MICROSECOND.

   G. LEAD TESTS: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING TESTS:

      (1) LEAD BEND TEST: WITH THE COMPONENT BODY HELD IN A VERTICAL POSITION AND A ONE POUND WEIGHT SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST, 2 CYCLES OF BENDS SHALL BE ACCOMPLISHED. ONE CYCLE OF BENDS SHALL CONSIST OF MOVING THE BODY OF THE UNIT IN THE SAME PLANE THROUGH 90 DEGREES IN ONE DIRECTION THEN BACK 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

      (2) LEAD PULL TEST: EACH LEAD SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS MINIMUM. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

   H. EACH DIODE SHALL BE MICROSCOPICALLY INSPECTED, BEFORE PAINTING, UNDER 10X MAGNIFICATION, FOR FOREIGN PARTICLES, TIPPED DICE, INCOMPLETE SEALING, AND REDUCTION OF LEAD DIAMETER AT POINT OF FUSING.

   I. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH MIL-S-19491 LEVEL C PRESERVATION AND PACKAGING AND LEVEL C PACKING. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.

2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

3. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.

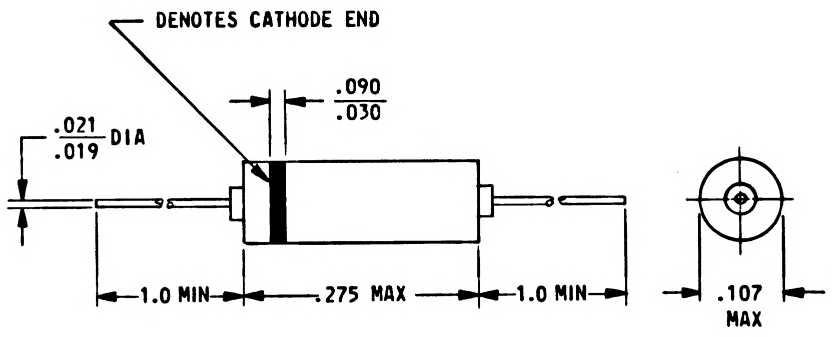
   B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.

   C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

FOR INFORMATION ONL

CLASS B RELEASE TDR No. 00165 DATE 12-12-62



MASTER

REV— A	REV—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE 1
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 21 Nov 62
CHECKED H. Maynard 27 Nov 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL W Kupfer 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE,
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 1 OF 2

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B | 1006751

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 3 PER TDRR 00433	2-20-63	W/B WK
B	REPLACED REV B WITH CHANGE PER TDRR 00513		WK

NOTES:

1. REQUIREMENTS:
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   - B. LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY, COPPER CLAD, GOLD PLATED IN ACCORDANCE WITH NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
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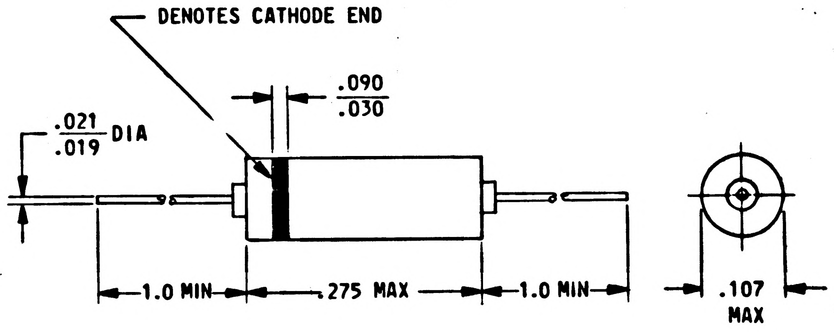
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12-12-62



Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

B	—
REV— A	REV—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 21 Nov 62
CHECKED H. Maynard 27 Nov 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL W Kupfer 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE,
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006751
SCALE NONE WT SHEET 1 OF 2

1006751 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WJ

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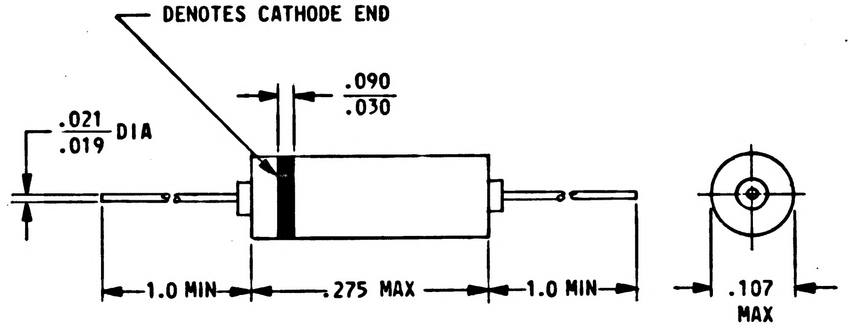

Ⓒ REPLACES REV B WITH CHANGE

MASTER

C	—
REV— A	REV—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 21 Nov 62
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APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE,
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 1 OF 2

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D 1006751

(M)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WJL
D	REVISED PER TDRR 01274	5-15-63	WK

NOTES:

1. REQUIREMENTS:

   A. ENCAPSULATION: GLASS. UNITS SHALL BE HERMETICALLY SEALED.

   B. LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY, COPPER CLAD, GOLD PLATED IN ACCORDANCE WITH NDPS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

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2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY

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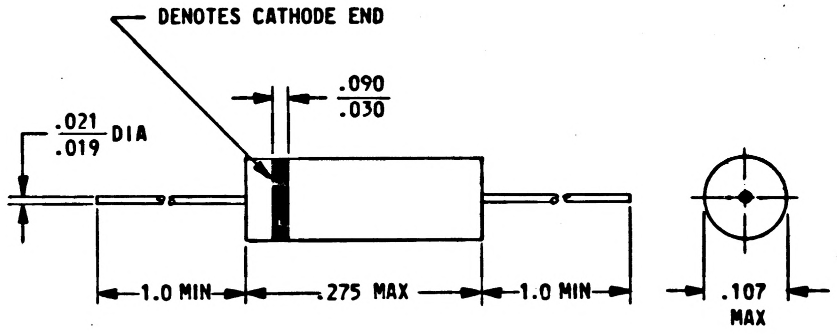

Ⓒ REPLACES REV B WITH CHANGE

MASTER

D	—
C	—
REV— A	REV—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTE 1

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
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SEMICONDUCTOR DEVICE, DIODE,
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006751

SCALE NONE WT SHEET 1 OF 2

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

E 1006751

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WJd
D	REVISED PER TDRR 01274	5-15-63	WK
E	REPLACED BY REV F WITH CHANGES PER TDRR 02006	7/17/63	JW

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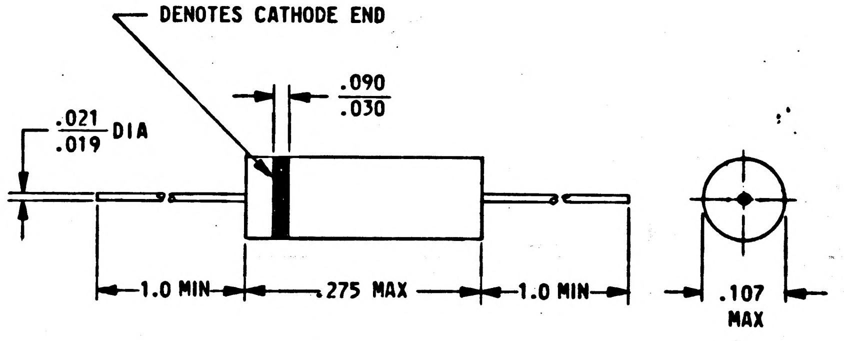

E REPLACED BY REV F WITH CHANGE

Ⓒ REPLACES REV B WITH CHANGE

MASTER

E	E
D	—
C	—
REV— A	REV—
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

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NEXT ASSY	USED ON

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH NONE

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APPROVAL
NASA APPROVAL W J Rhine 12-12-62
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SEMICONDUCTOR DEVICE, DIODE,

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 1 OF 2

INCHES 0 1 2
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E 1006751

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACED BY REV F WITH CHANGES PER TDRR 62006	7/17/63	

TABLE I

INSPECTION REQUIREMENTS

TEST CONDITIONS: AT EXISTING LOCAL ATMOSPHERIC PRESSURE AND 25°C ± 3°C

PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNIT	AQL (%) OR LTPD (%)
VISUAL AND DIMENSIONAL INSPECTION						0 SEE NOTE 1F
LEAD BEND		SEE NOTE G(1)				
LEAD PULL		SEE NOTE G(2)	4		LB	
INVERSE CURRENT	I_R	V_R = 15 VOLTS MIN		10	MUA	
REVERSE BREAKDOWN VOLTAGE	V_R	I_R = 100 UA MAX	30		V	
FORWARD SURGE CURRENT	i_f	1 SEC MIN REPETATIVE DUTY CYCLE 1%		2	A	
FORWARD VOLTAGE DROP (PEAK)	V_f	I_F = 40 MA	.75	.85	V	
FORWARD VOLTAGE DROP (PEAK)	V_f	I_F = 400 MA		1.25	V	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

E REPLACED BY REV F WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

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DRAWN Gary Wheeler DATE 21 Nov 62
CHECKED F. Maynard 27 Nov 62
APPROVAL
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/14/62

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006751
SCALE | WT | SHEET 2 OF 2

MASTER

INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.
2. ACCEPTANCE AND INSPECTION:
   - A. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.
     - (2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.
   - B. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.
     - (2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK BAND DENOTING THE CATHODE END. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
     - (3) LEAD MATERIAL: LEAD MATERIAL SHALL BE NICKEL AND GOLD PLATED PER ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
3. DESIGN:
   - A. ABSOLUTE MAXIMUM RATINGS:
     - (1) POWER DISSIPATION: 500 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.
     - (2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 175 DEGREES CENTIGRADE.
     - (3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.
     - (4) PEAK FORWARD SURGE CURRENT ($i_{f\ SURGE}$): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.
   - B. CONSTRUCTION: GLASS, HERMETICALLY SEALED ENCLOSURE.
   - C. THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING A THERMAL SHOCK IN SILICON OIL FROM ZERO DEGREES CENTIGRADE TO +300 DEGREES CENTIGRADE FOR 5 COMPLETE CYCLES. TOTAL IMMERSION TIME EACH HALF CYCLE SHALL BE 30 SECONDS. ELAPSED TRANSFER TIME FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 3 SECONDS.

     UNITS SHALL SHOW NO PHYSICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE AFTER THERMAL SHOCK.
   - D. LEAD BEND TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD BEND TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION E. A WEIGHT OF 16 OUNCES PLUS OR MINUS 1 OUNCE SHALL BE APPLIED TO EACH LEAD. THE LEAD SHALL BE RESTRICTED SUCH THAT THE BEND STARTS 3/32 INCH PLUS OR MINUS 1/32 INCH FROM THE BODY OF THE DEVICE.

     NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.
   - E. LEAD PULL TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD PULL TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A WITH A STRAIGHT AXIAL PULL OF 4 POUNDS MINIMUM FOR 1 MINUTE:

     NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

F	F
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

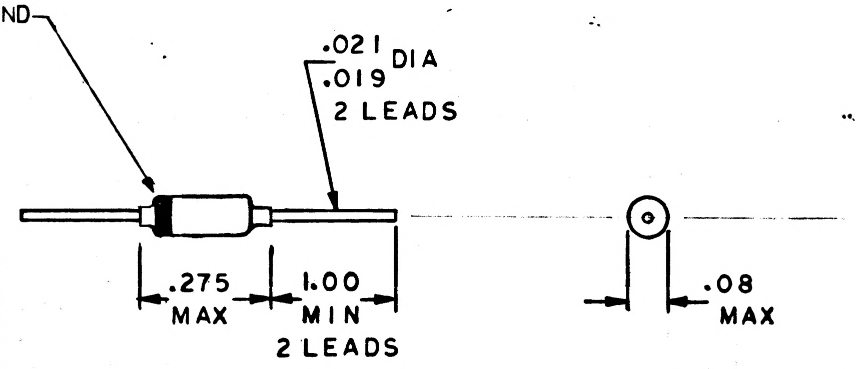
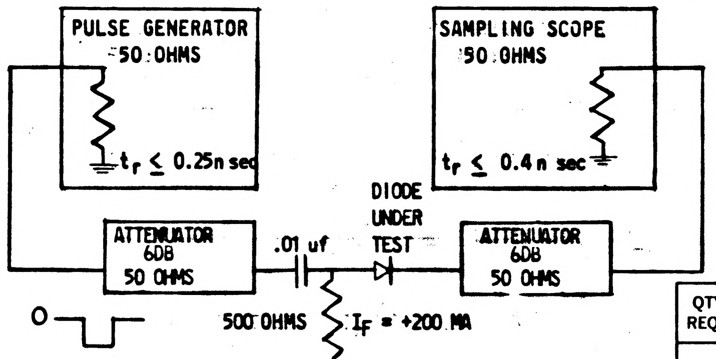


FIGURE 1

TEST CIRCUIT - REVERSE RECOVERY TIME



F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL S. Halzel 7/17/63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
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1006751 F

REVISIONS

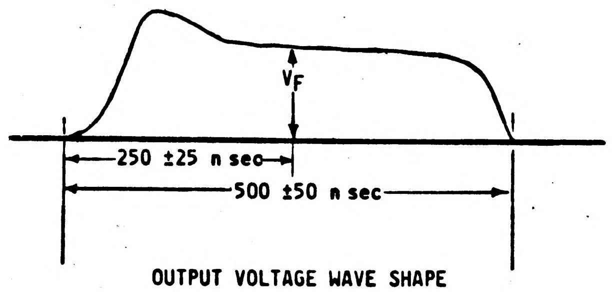
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV. E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	

TABLE I

ELECTRICAL CHARACTERISTICS

ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 25 VOLTS MIN	-	50	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	30	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 200 MA I_R = 200 MA RECOVER TO 20 MA	-	4	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.750 -	.850 -	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%; SEE FIG 2	-	1.25	VOLTS
6	CAPACITANCE	C	V_R = 0 VDC f = 1 MC		3.5	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150°C V_R = 25 VOLTS MIN		10	MICROAMPS



OUTPUT VOLTAGE WAVE SHAPE
FIGURE 2

MASTER

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
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APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL L Halzel 7/17/63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006751
SCALE NONE WT SHEET 2 OF 2

1006751 F

INCHES
0 1 2
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1006751 G

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE .PER TDRR 02006	7/17/63	
G	REVISED PER TDRR 02819	8/28/63	ECH

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REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.

   E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

   A. ELECTRICAL CHARACTERISTICS: PER TABLE I.

   (1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.

   (2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

   B. MECHANICAL PROPERTIES:

   (1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

   (2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK BAND DENOTING THE CATHODE END. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.

   (3) LEAD MATERIAL: LEAD MATERIAL SHALL BE NICKEL AND GOLD PLATED PER ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

   A. ABSOLUTE MAXIMUM RATINGS:

   (1) POWER DISSIPATION: 500 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.

   (2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 175 DEGREES CENTIGRADE.

   (3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

   (4) PEAK FORWARD SURGE CURRENT ($i_{f\ SURGE}$): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.

   B. CONSTRUCTION: GLASS, HERMETICALLY SEALED ENCLOSURE.

   C. THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING A THERMAL SHOCK IN SILICON OIL FROM ZERO DEGREES CENTIGRADE TO +300 DEGREES CENTIGRADE FOR 5 COMPLETE CYCLES. TOTAL IMMERSION TIME EACH HALF CYCLE SHALL BE 30 SECONDS. ELAPSED TRANSFER TIME FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 3 SECONDS.

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   D. LEAD BEND TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD BEND TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION E. A WEIGHT OF 16 OUNCES PLUS OR MINUS 1 OUNCE SHALL BE APPLIED TO EACH LEAD. THE LEAD SHALL BE RESTRICTED SUCH THAT THE BEND STARTS 3/32 INCH PLUS OR MINUS 1/32 INCH FROM THE BODY OF THE DEVICE.

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   E. LEAD PULL TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD PULL TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A WITH A STRAIGHT AXIAL PULL OF 4 POUNDS MINIMUM FOR 1 MINUTE:

   NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

G	G
F	F
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

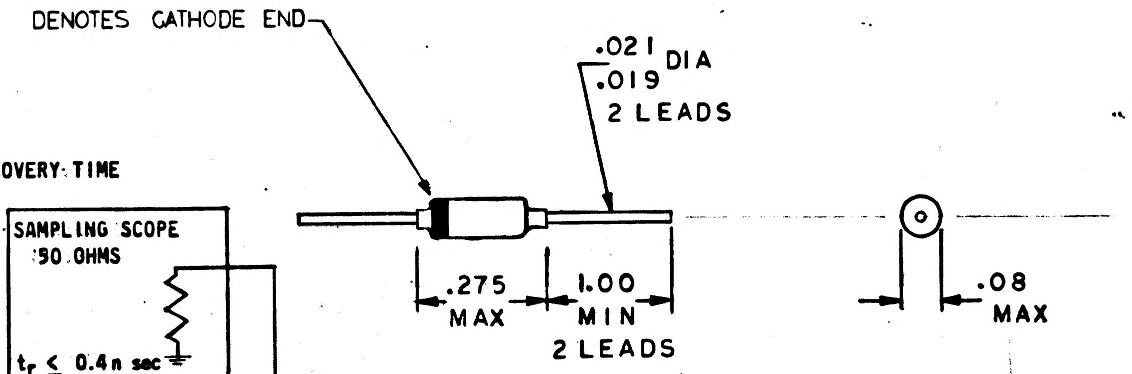
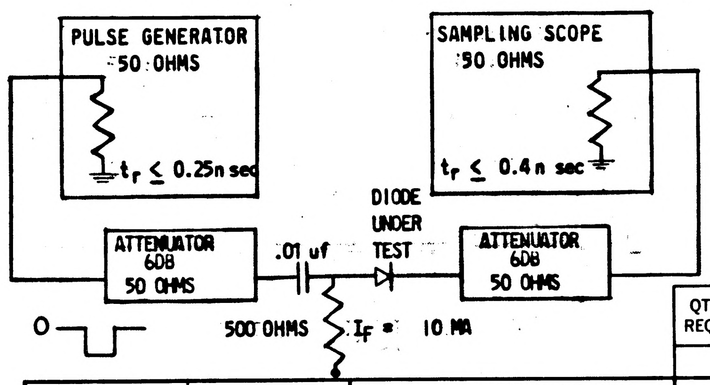


FIGURE 1

TEST CIRCUIT - REVERSE RECOVERY TIME



F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DRAWN C. Crespi DATE 27 June 63
CHECKED J. Ruggiero 27 June 63 W. Wayland
APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL 7/17/63

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SPECIFICATION CONTROL DRAWING

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	C	1006751
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1006751 G

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV. E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	
G	REVISED PER TDRR 02819	8/28/63	ECH /

Ⓜ

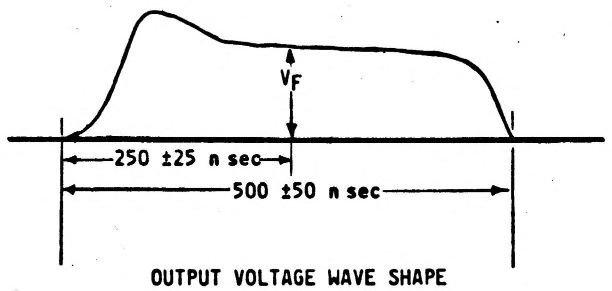
TABLE I

ELECTRICAL CHARACTERISTICS

ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 25 VOLTS MIN	-	50	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	30	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA OR EQUIVALENT SEE NOTE RECOVER TO 1 MA	-	8	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.750 -	.850 -	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%, SEE FIG 2	-	1.25	VOLTS
6	CAPACITANCE	C	V_R = 0 VDC f = 1 MC		3.5	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150°C V_R = 25 VOLTS MIN		30	MICROAMPS

NOTE: USING TECHTRONIC S UNIT MEASURE STORED CHARGE UNDER FOLLOWING CONDITIONS: I_F = 5ma; I_R = 100 u amp; t_{rr} max 0.5 u sec



OUTPUT VOLTAGE WAVE SHAPE
FIGURE 2

MASTER

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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DRAWN C. Crespi DATE 27 June 63
CHECKED A. Maynard 27 June 63
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MIT APPROVAL 7/17/63

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SPECIFICATION CONTROL DRAWING

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INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	
G	REVISED PER TDRR 02819	8/28/63	ECH
H	REVISED PER TDRR 06009	2/4/64	EPK WK

(M)

(M)

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

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D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. ELECTRICAL CHARACTERISTICS: PER TABLE I.

(1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.

(2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

B. MECHANICAL PROPERTIES:

(1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

(2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK BAND DENOTING THE CATHODE END AND THE THREE DIGITS 751 PER DRAWING. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 AND SHALL INCLUDE THE NASA DRAWING NUMBER. REVISION LETTER AND DASH NUMBER.

(3) LEAD MATERIAL: LEAD MATERIAL SHALL BE NICKEL PER PS 1015400. GOLD PLATING PER PARAGRAPH 3.2 IS OPTIONAL. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 500 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.

(2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 175 DEGREES CENTIGRADE.

(3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(4) PEAK FORWARD SURGE CURRENT ($i_{f\ SURGE}$): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.

B. CONSTRUCTION: GLASS, HERMETICALLY SEALED ENCLOSURE.

C. THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING A THERMAL SHOCK IN SILICON OIL FROM ZERO DEGREES CENTIGRADE TO +300 DEGREES CENTIGRADE FOR 5 COMPLETE CYCLES. TOTAL IMMERSION TIME EACH HALF CYCLE SHALL BE 30 SECONDS. ELAPSED TRANSFER TIME FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 3 SECONDS.

UNITS SHALL SHOW NO PHYSICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE AFTER THERMAL SHOCK.

D. LEAD BEND TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD BEND TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION E. A WEIGHT OF 16 OUNCES PLUS OR MINUS 1 OUNCE SHALL BE APPLIED TO EACH LEAD. THE LEAD SHALL BE RESTRICTED SUCH THAT THE BEND STARTS 3/32 INCH PLUS OR MINUS 1/32 INCH FROM THE BODY OF THE DEVICE.

NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

E. LEAD PULL TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD PULL TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A WITH A STRAIGHT AXIAL PULL OF 4 POUNDS MINIMUM FOR 1 MINUTE:

NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

H	G
G	G
F	F
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

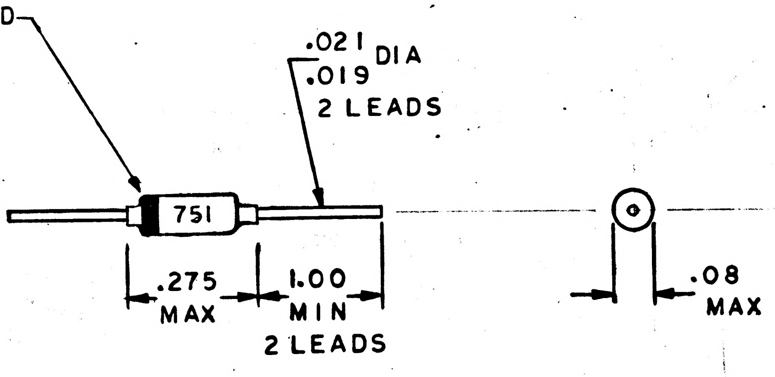
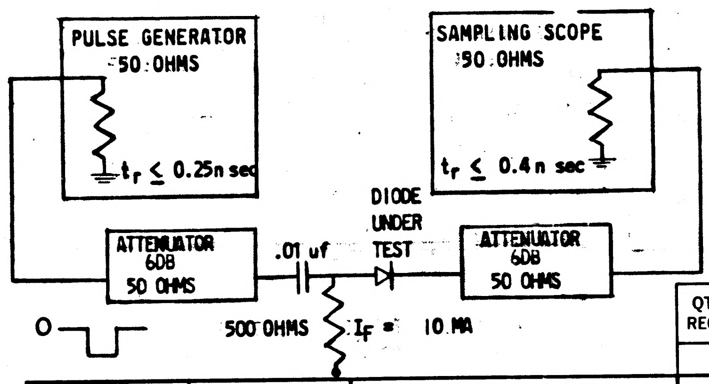


FIGURE 1

TEST CIRCUIT - REVERSE RECOVERY TIME



F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN C. Crespi DATE 27 June 63
CHECKED J. Ruggiero / B. Maynard 27 June 63
APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL L. Hulzd 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006751 J

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	
G	REVISED PER TDRR 02819	8/28/63	ECN
H	REVISED PER TDRR 06009	2/4/64	EOK WR.
J	REVISED PER TDRR 06669		WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. ELECTRICAL CHARACTERISTICS: PER TABLE I.

(1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.

(2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

B. MECHANICAL PROPERTIES:

(1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

(2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK BAND DENOTING THE CATHODE END AND THE THREE DIGITS 751 PER DRAWING. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 AND SHALL INCLUDE THE NASA DRAWING NUMBER. REVISION LETTER AND DASH NUMBER.

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(3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

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B. CONSTRUCTION: CLEAR UNPAINTED GLASS, HERMETICALLY SEALED ENCLOSURE.

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E. LEAD PULL TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD PULL TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A WITH A STRAIGHT AXIAL PULL OF 4 POUNDS MINIMUM FOR 1 MINUTE:

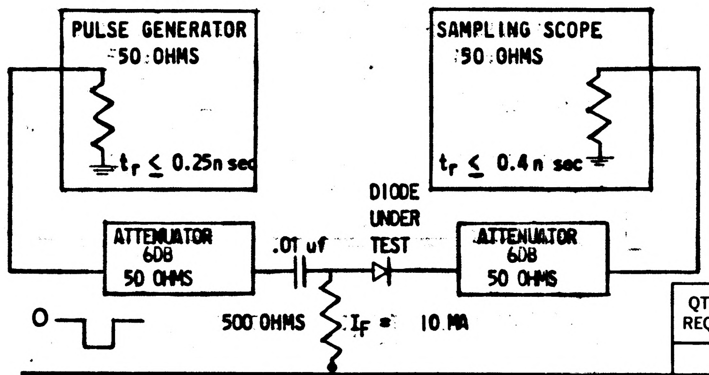
NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

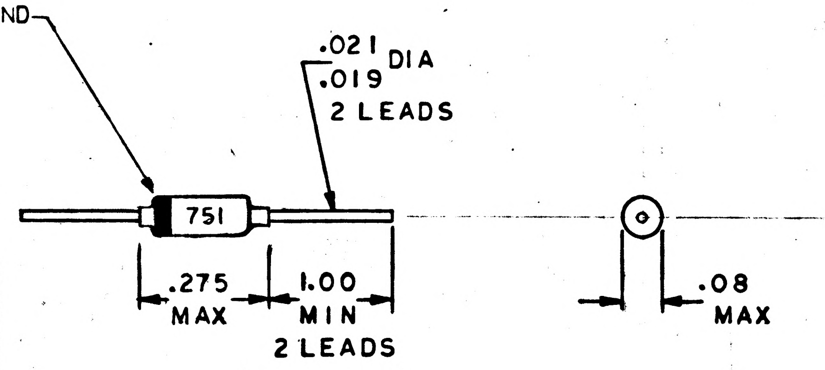
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

J	J
H	G
G	G
F	F
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

FIGURE 1

TEST CIRCUIT - REVERSE RECOVERY TIME





F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. Crespi DATE 27 June 63
CHECKED J. Ruggiero W. Maynard 27 June 63
APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL S. Halzel 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006751 J

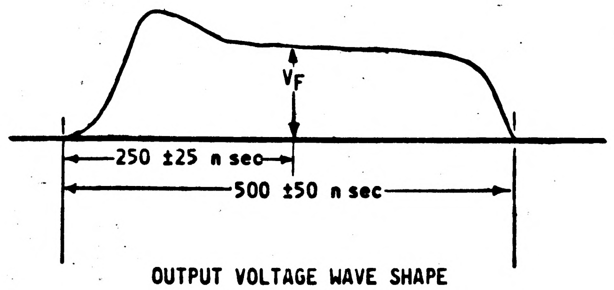
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV. E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	
G	REVISED PER TDRR 02819	8/28/63	ECH /
H	REVISED PER TDRR 06009		WK
J	REVISED PER TDRR 06669		WR

TABLE I

ELECTRICAL CHARACTERISTICS

ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 25 VOLTS MIN	-	50	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	30	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA RECOVER TO 1 MA	-	70	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.730 -	.850 -	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%; SEE FIG 2	-	1.35	VOLTS
6	CAPACITANCE	C	V_R = 1 VDC f = 1 MC		10	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150°C V_R = 25 VOLTS MIN		- 30	MICROAMPS



OUTPUT VOLTAGE WAVE SHAPE
FIGURE 2

MASTER

F REPLACES REVE WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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DRAWN C. Crespi DATE 27 June 63
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MIT APPROVAL 7/17/63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
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SYM	DESCRIPTION	DATE	APPROVAL
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G	REVISED PER TDRR 02819	8/28/63	ECA
H	REVISED PER TDRR 06009	2/4/64	EPK WK
J	REVISED PER TDRR 06669		WK
K	REVISED PER TDRR 13255	10/14	

REQUIREMENTS:

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2. ACCEPTANCE AND INSPECTION:

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(2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105, INSPECTION LEVEL I, AQL OF 4 PERCENT.

B. MECHANICAL PROPERTIES:

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PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

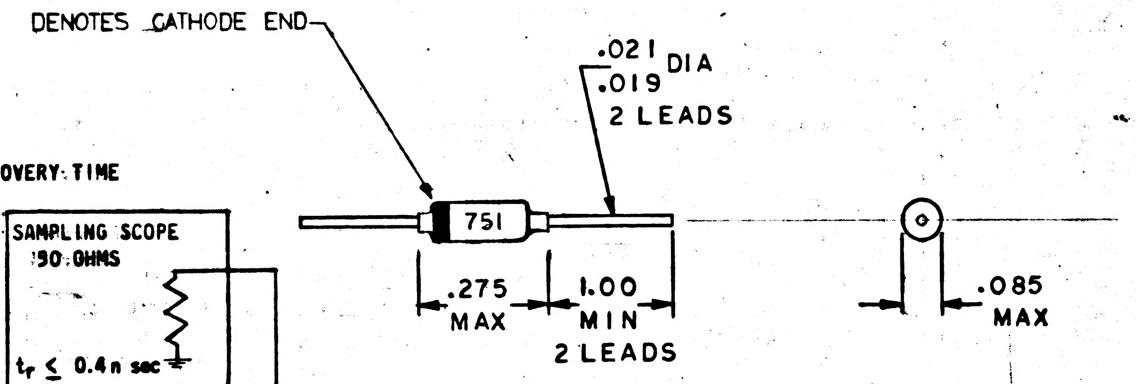
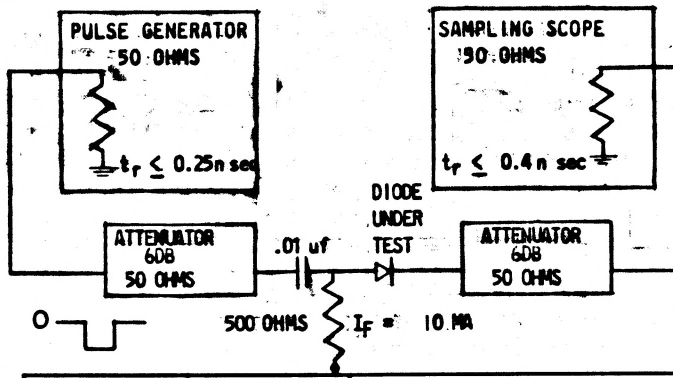


FIGURE 1

TEST CIRCUIT - REVERSE RECOVERY TIME



MASTER

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 27 June 63
CHECKED J. Ruggieri / H. Maynard 27 June 63
APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006751
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006751 K

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV. E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	
G	REVISED PER TDRR 02819	8/28/63	ECH /
H	REVISED PER TDRR 06009		WK
J	REVISED PER TDRR 06669		WK
K	REVISED PER TDRR 13255		

TABLE I

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ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED

ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
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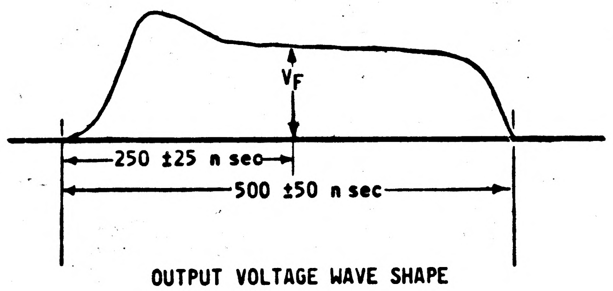
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	30	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA OR EQUIVALENT SEE NOTE RECOVER TO 1 MA	-	70	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.730	.850	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%; SEE FIG 2	-	1.35	VOLTS
6	CAPACITANCE	C	V_R = 1 VDC f = 1 MC		10	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150°C V_R = 25 VOLTS MIN		30	MICROAMPS

NOTE: USING TEKTRONIX S UNIT MEASURE STORED CHARGE UNDER FOLLOWING [illegible]

CONDITIONS: [illegible]



OUTPUT VOLTAGE WAVE SHAPE
FIGURE 2

MASTER

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL	DRAWN C. Gaspi DATE 27 Jun 63 CHECKED A. Maynard 27 June 63 APPROVAL APPROVAL Eldon C Hall 10 July 63	SEMICONDUCTOR DEVICE, DIODE SPECIFICATION CONTROL DRAWING
		HEAT TREATMENT	NASA APPROVAL W J Rhine 7-17-63	CODE IDENT NO. — SIZE C — NASA DRAWING NO. 1006751
		FINAL FINISH	MIT APPROVAL 7/17/63	SCALE NONE — WT — SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006751 L

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J	REVISED PER TDRR 06669		WR
K	REVISED PER TDRR 13255	10/14	
L	REVISED PER TDRR 19608	6-2-65	WR

Ⓜ Ⓜ Ⓜ Ⓝ

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491 LEVEL A, IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. ELECTRICAL CHARACTERISTICS: PER TABLE I.

(1) ITEMS 1 THRU 5: 100 PERCENT INSPECTION.

(2) ITEMS 6 AND 7: SAMPLE IN ACCORDANCE WITH MIL-STD-105,, INSPECTION LEVEL I, AQL OF 4 PERCENT.

B. MECHANICAL PROPERTIES:

(1) DIMENSIONS: PER OUTLINE. SAMPLE IN ACCORDANCE WITH MIL-STD-105,, INSPECTION LEVEL I, AQL OF 4 PERCENT.

(2) MARKING: DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-S-19500 WITH A BLACK BAND DENOTING THE CATHODE END AND THE THREE DIGITS 751 PER DRAWING. UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 AND SHALL INCLUDE THE NASA DRAWING NUMBER. REVISION LETTER AND DASH NUMBER.

(3) LEAD MATERIAL: LEAD MATERIAL SHALL BE NICKEL PER PS 1015400. GOLD PLATING PER PARAGRAPH 3.2 IS OPTIONAL. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 500 MILLIWATTS AT 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE.

(2) JUNCTION TEMPERATURE (T_J): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 175 DEGREES CENTIGRADE.

(3) STORAGE TEMPERATURE (T_{STG}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(4) PEAK FORWARD SURGE CURRENT ($i_{f\ SURGE}$): 1 AMPERE FOR 1 SECOND MINIMUM. REPETATIVE DUTY CYCLE OF 1 PERCENT.

B. CONSTRUCTION: CLEAR UNPAINTED GLASS, HERMETICALLY SEALED ENCLOSURE.

C. THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING A THERMAL SHOCK IN SILICON OIL FROM ZERO DEGREES CENTIGRADE TO +300 DEGREES CENTIGRADE FOR 5 COMPLETE CYCLES. TOTAL IMMERSION TIME EACH HALF CYCLE SHALL BE 30 SECONDS. ELAPSED TRANSFER TIME FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 3 SECONDS.

UNITS SHALL SHOW NO PHYSICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE AFTER THERMAL SHOCK.

D. LEAD BEND TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD BEND TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION E.

NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

E. LEAD PULL TEST: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING A LEAD PULL TEST IN ACCORDANCE WITH MIL-STD-750, METHOD 2036, TEST CONDITION A WITH A STRAIGHT AXIAL PULL OF 4 POUNDS MINIMUM FOR 1 MINUTE:

NO MECHANICAL DAMAGE OR LACK OF ELECTRICAL PERFORMANCE SHALL BE EVIDENCED AFTER THIS TEST.

4. SPECIAL CONDITIONING BY SUPPLIER.

A. "BURN-IN: PARTS SHALL BE BURNED-IN FOR 240 HOURS AT THE FOLLOWING CONDITIONS:

(1) AMBIENT TEMPERATURE, T_A = +25° ± 5°C.

(2) THE DIODE SHALL BE STRESSED BY AN APPROXIMATELY SINUSOIDAL 60 ± 6 CPS SINE WAVE AT 25 VOLT PEAK. THE AVERAGE AC CURRENT SHALL BE 75 MA.

(3) DIODES THAT FAIL TO MEET ALL INITIAL REQUIREMENTS AND THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

(4) PARAMETRIC CHANGE LIMITS:

(a) FORWARD VOLTAGE DROP: .030 VOLT MAXIMUM CHANGE

(b) REVERSE CURRENT: 3 TIMES INITIAL MEASUREMENT OR 10 NANOAMPS, WHICHEVER IS GREATER. UNITS MEASURING 1 NANOAMP OR LESS MAY INCREASE TO 5 NANOAMPS."

B. "THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:

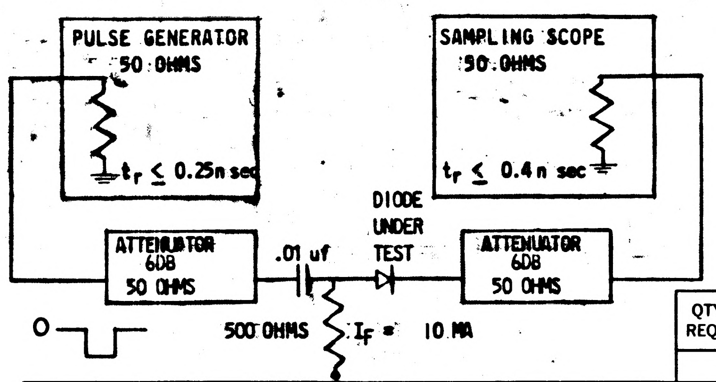
(1) FORWARD VOLTAGE DROP AT I_F = 400 MA.

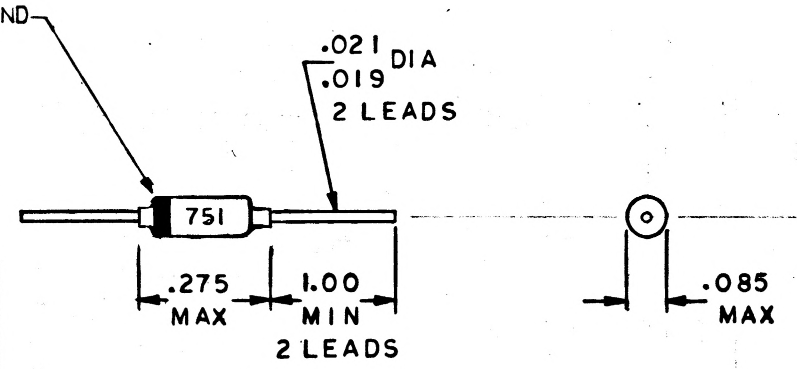
(2) REVERSE CURRENT AT T_A - 25°C."

(CONTINUED ON SHEET 2)

FIGURE 1

TEST CIRCUIT - REVERSE RECOVERY TIME





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DRAWN C. Crespi DATE 27 June 63
CHECKED J. Ruggiero / St. Maynard 27 June 63
APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL S. Halzel 7/17/63

MANNED SPACECRAFT CENTER
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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006751
SCALE NONE	WT	SHEET 1 OF 2

MASTER

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1006751 L

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02006	7/17/63	
G	REVISED PER TDRR 02819	8/28/63	ECH /
H	REVISED PER TDRR 06009		
J	REVISED PER TDRR 06669		WK
K	REVISED PER TDRR 13255		
L	REVISED PER TDRR 19608	6-2-65	WK

TABLE I

ELECTRICAL CHARACTERISTICS

ALL MEASUREMENTS AT 25°C ± 3°C UNLESS OTHERWISE NOTED						
ITEM	PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS
1	REVERSE CURRENT	I_R	V_R = 25 VOLTS MIN	-	50	NANOAMPS
2	REVERSE BREAKDOWN VOLTAGE	BV	I_R = 100 UA	30	-	VOLTS
3	REVERSE RECOVERY TIME (SEE TEST CIRCUIT FIGURE 1)	t_{rr}	I_F = 10 MA I_R = 10 MA RECOVER TO 1 MA	-	70	NANOSECONDS
4	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 40 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1% SEE FIG. 2	.730 -	.850 -	VOLTS
5	FORWARD VOLTAGE DROP MIL-STD-750 METHOD 4026	V_F	I_F = 400 MA RISE TIME ≤ 100 NANOSEC DUTY CYCLE ≤ 1%, SEE FIG 2	-	1.35	VOLTS
6	CAPACITANCE	C	V_R = 1 VDC f = 1 MC		10	PICOFARADS
7	REVERSE CURRENT	I_R	AT 150°C V_R = 25 VOLTS MIN		30	MICROAMPS

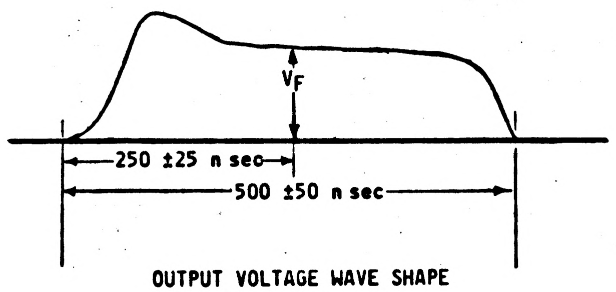
4. SPECIAL CONDITIONING BY SUPPLIER (CONTINUED)

C. "THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL DIODE WITH THE INITIAL TEST READING, THE FINAL READING, AND THE PER CENT OR ABSOLUTE CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS."

D. "LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN."

TABLE II

PART NUMBER	ELECTRICAL CHARACTERISTICS	SPECIAL CONDITIONING BY SUPPLIER
1006751-000	PER TABLE I	NONE
1006751-001	PER TABLE I	PER PARAGRAPH 4



OUTPUT VOLTAGE WAVE SHAPE
FIGURE 2

MASTER

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT

DRAWN C. Crespi DATE 27 Jun 63
CHECKED A. Maynard 27 June 63
APPROVAL
APPROVAL Eldon C Hall 10 July 63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL 7/17/63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006751
SCALE NONE
WT
SHEET 2 OF 2

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1006751

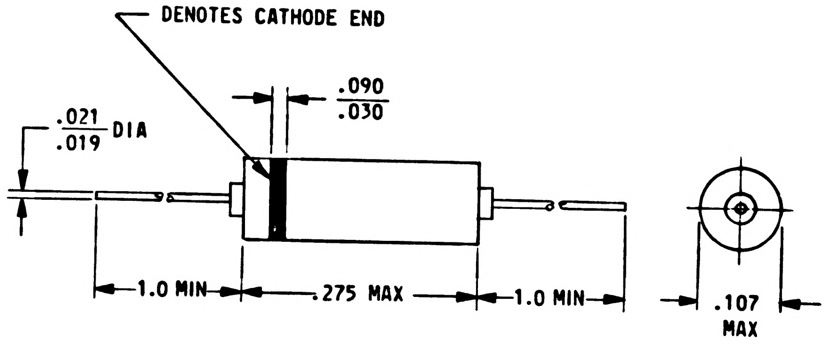
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. REQUIREMENTS:
   - A. ENCAPSULATION: GLASS. UNITS SHALL BE HERMETICALLY SEALED.
   - B. LEAD MATERIAL SHALL BE IRON-NICKEL ALLOY, COPPER CLAD, GOLD PLATED IN ACCORDANCE WITH NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - C. SHALL WITHSTAND A THERMAL SHOCK OF 300°C FROM 0°C WITHIN 30 SECONDS AND BE RETURNED TO ROOM AMBIENT WITHOUT AFFECTING OPERATING CHARACTERISTICS AS SPECIFIED HEREIN, IN ADDITION TO THE REQUIREMENTS OF ND 1002000.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF NASA DOCUMENT 1015404 SECTION II.
   - E. UNITS SHALL BE 100 PERCENT INSPECTED FOR COMPLIANCE WITH THE REQUIREMENTS IN TABLE I UNLESS OTHERWISE SPECIFIED.
   - F. TRANSIENT RESPONSE: USING A TECHTRONIX TYPE S PLUG-IN UNIT AND I_F = 5 MILLIAMPERES AND I_R = 100 MICROAMPERES, THE MEASURED TIME MUST BE LESS THAN .5 MICROSECOND. THE SLOPE OF THAT PORTION OF THE DISCHARGE CURVE CORRESPONDING TO LINEAR CAPACITANCE SHALL BE GREATER THAN .5 VOLTS AND .2 MICROSECOND.
   - G. LEAD TESTS: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING TESTS:
     - (1) LEAD BEND TEST: WITH THE COMPONENT BODY HELD IN A VERTICAL POSITION AND A ONE POUND WEIGHT SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST, 2 CYCLES OF BENDS SHALL BE ACCOMPLISHED. ONE CYCLE OF BENDS SHALL CONSIST OF MOVING THE BODY OF THE UNIT IN THE SAME PLANE THROUGH 90 DEGREES IN ONE DIRECTION THEN BACK 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
     - (2) LEAD PULL TEST: EACH LEAD SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS MINIMUM. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
   - H. EACH DIODE SHALL BE MICROSCOPICALLY INSPECTED, BEFORE PAINTING, UNDER 10X MAGNIFICATION, FOR FOREIGN PARTICLES, TIPPED DICE, INCOMPLETE SEALING, AND REDUCTION OF LEAD DIAMETER AT POINT OF FUSING.
   - I. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH MIL-S-19491 LEVEL C PRESERVATION AND PACKAGING AND LEVEL C PACKING. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12-12-62



ORIGINAL SOURCE OF SUPPLY:

SEE QUALIFIED VENDOR LIST
ND

REV—	REV—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 1

HEAT TREATMENT
NONE

FINAL FINISH
NONE

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DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 21 Nov 62
CHECKED H. Maynard 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL

NASA APPROVAL 12-12-62

MIT APPROVAL 12/12/62

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SEMICONDUCTOR DEVICE, DIODE, SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006751
SCALE NONE	WT	SHEET 1 OF 2

1006751

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

TABLE I

INSPECTION REQUIREMENTS

TEST CONDITIONS: AT EXISTING LOCAL ATMOSPHERIC PRESSURE AND 25°C ± 3°C

PARAMETER	SYMBOL	CONDITIONS	LIMITS MIN	LIMITS MAX	UNIT	AQL (%) OR LTPD (%)
VISUAL AND DIMENSIONAL INSPECTION						0 SEE NOTE 1F
LEAD BEND		SEE NOTE G(1)				
LEAD PULL		SEE NOTE G(2)	4		LB	
INVERSE CURRENT	I_R	V_R = 15 VOLTS MIN		10	MUA	
REVERSE BREAKDOWN VOLTAGE	V_R	I_R = 100 UA MAX	30		V	
FORWARD SURGE CURRENT	i_f	1 SEC MIN REPETATIVE DUTY CYCLE 1%		2	A	
FORWARD VOLTAGE DROP (PEAK)	v_f	I_F = 40 MA	.75	.85	V	
FORWARD VOLTAGE DROP (PEAK)	v_f	I_F = 400 MA		1.25	V	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± // DECIMALS ± // ANGLES ± //
DO NOT SCALE THIS DRAWING
MATERIAL —//—
HEAT TREATMENT —//—
FINAL FINISH —//—

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CONTRACT

DRAWN Gary Wheeler DATE 21 Nov 62
CHECKED F. Maynard 27 Nov 62
APPROVAL
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL W A Koppe for 12/12/62

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SEMICONDUCTOR DEVICE, DIODE,
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006751
SCALE
WT
SHEET 2 OF 2

1006751

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A	1006752

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00398		WK

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

   B. ABSOLUTE MAXIMUM RATINGS AT +25°C AMBIENT.

      (1) COLLECTOR TO EMITTER VOLTAGE (VCEO): 15 VOLTS DC

      (2) COLLECTOR TO BASE VOLTAGE (VCBO): 40 VOLTS DC

      (3) EMITTER TO BASE VOLTAGE (VEBO): 5 VOLTS DC

      (4) COLLECTOR CURRENT (IC): 300 MILLIAMPERES

      (5) POWER DISSIPATION: 1.2 WATTS AT +25°C CASE TEMPERATURE.

      (6) THERMAL RESISTANCE, JUNCTION - CASE, (θ_{JC}): 145° C/WATT.

      (7) THERMAL RESISTANCE, JUNCTION - AMBIENT, (θ_{JA}): 480° C/WATT.

   C. TEMPERATURE:

      (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.

      (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.

      (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).

   D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER AND THE NUMBER 752. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:

   A. SEMICONDUCTOR: SILICON, NPN.

   B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-18).

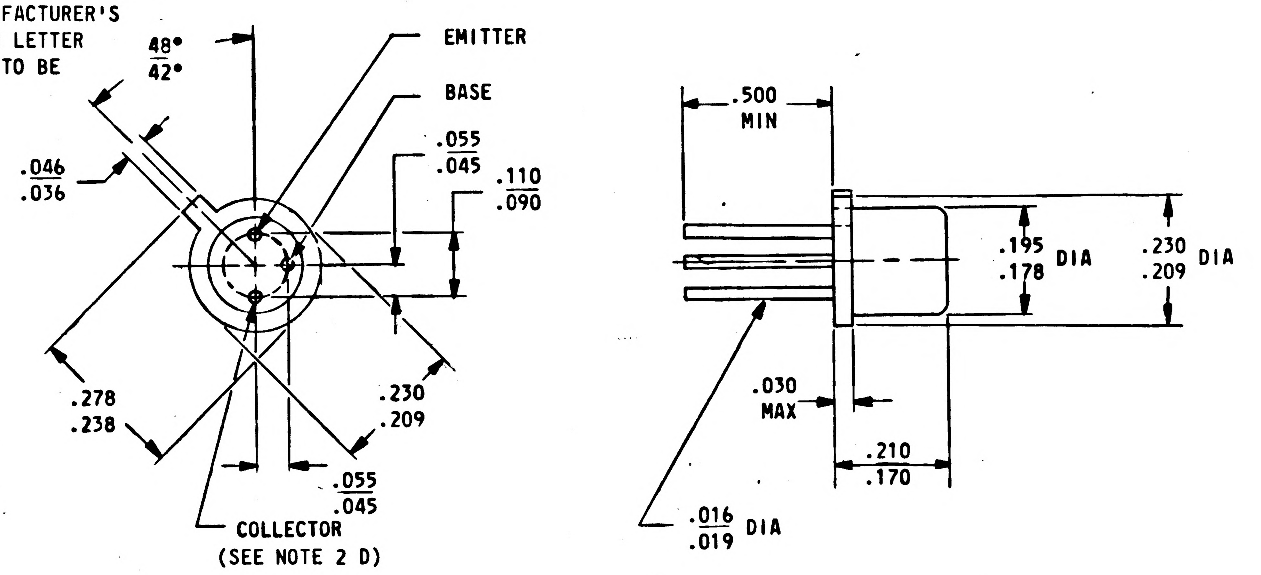
   C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

   D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:

   A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

   B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



A	A	A	A
–	–		
SHEET 1	SHEET 2	SHEET 3	SHEET 4
	REVISION STATUS OF SHEETS		

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST NASA DOCUMENT NO . 002034

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

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DWG. NO. CONTRACT

DRAWN A. Matz DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W J Rhine 2-13-63
MIT APPROVAL 13 Feb 63

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TRANSISTOR, SILICON, TYPE NPN LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006752
SCALE NONE WT SHEET 1 OF 4

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00398	2-18/63	WK

NOTES (CONTINUED):

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHOD: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 1.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72 $^{+8}_{-4}$ HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 327 MILLIWATTS V_{CE} = 11 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±. DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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DWG. NO. CONTRACT
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CHECKED H Maynard 1-25-63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W J Rhine 2-13-63
MIT APPROVAL W Kupfer 13 Feb 63

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HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE; NPN LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006752
SCALE WT SHEET 2 OF 4

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1006752 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00398	2-13-63	

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	TEST CONDITIONS	LIMITS		UNIT	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO = 3	LTPD* = 10 MAX ACC NO = 3
SUBGROUP 2 COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V; I_E = 0		25	nA	100%	LTPD* = 2 (COMBINED) MAX ACC NO = 3
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V; I_E = 0, T_A = +150°C		15	uA		
COLLECTOR BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = 10 uA; I_E = 0	40		Vdc	↓	
EMITTER BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = 10 uA; I_C = 0	5		Vdc		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} (SUST)	I_C = 10 mA (PULSED)	15		Vdc		↓
EMITTER BASE REVERSE CURRENT	I_{EBO}	V_{EB} = 4 V; I_C = 0		0.1	uA		
COLLECTOR-EMITTER CURRENT RESISTANCE RETURN	I_{CER}	V_{CE} = 30 V; R_{BE} = 100 K		1.0	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE} = 0.45 V; V_{CE} = 20 V		1	uA		
DC CURRENT GAIN	h_{FE}	I_C = 100 mA; V_{CE} = 1 V	20		-		
DC CURRENT GAIN	h_{FE}	I_C = 10 mA; V_{CE} = 1 V	30	90	-		
DC CURRENT GAIN	h_{FE}	I_C = 1 mA; V_{CE} = 1 V	20		-		
BASE EMITTER SATURATION VOLTAGE	V_{BE} (SAT)	I_C = 10 mA; I_B = 1 mA	0.70	0.80	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE} (SAT)	I_C = 10 mA; I_B = 1 mA		0.25	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE} (SAT)	I_C = 100 mA; I_B = 10 mA		.70	Vdc		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = 10 V; I_E = 0; f = 140 kc SEE NOTE 3 D (4)		6	pf		
TURNOFF TIME	T_{off}	I_{B1} = 3 mA; I_{B2} = 1 mA V_{CC} = 3 V; R_L = 270 Ω tw ≥ 400 nSEC; 2% DUTY CYCLE		75	nSEC		
CHARGE STORAGE TIME CONSTANT	T_s	I_{B1} = I_{B2} = I_C = 10 mA R_L = 1000; V_{CC} = 10 VDC		25	nSEC		
TURN ON TIME	T_{on}	I_{B1} = 3 mA; V_{BE} = -2 V V_{CC} = 3 V; R_L = 270 Ω tw ≤ 400 nSEC; 2% DUTY CYCLE		40	nSEC		

* LTPD PER MIL-S-19500C, TABLE IV

MASTER

REVISION A THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

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DWG. NO. CONTRACT

DRAWN a. Marts DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL 2-13-63
APPROVAL

NASA APPROVAL W J Rhine 2-13-63

MIT APPROVAL 13 Feb 63

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TRANSISTOR, SILICON, TYPE NPN LOGIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006752

SCALE
WT
SHEET 3 OF 4

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00398	2-13/63	WK

TABLE III

QUALITY DEMONSTRATION TESTS

TEST	TEST CONDITION	LOT	
		1 TO 500	OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2** THERMAL SHOCK SEAL TEST	METHOD 1056, CONDITION B (+200°C TO -65°C, 5 CYCLES) SEE NOTE 3 D (3)		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3** STORAGE LIFE	METHOD 1031 Tstg = 200° ± 5°C, 1000 HOURS		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SHOCK	METHOD 2016, 1500 G, 0.5 MSEC, 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL		
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM.		
CONSTANT ACCELERATION	METHOD 2006, 20,000 G		
SUBGROUP 4 OPERATION LIFE	METHOD 1026 P = 327 MILLIWATTS V_{CE} = 11 VOLTS MINIMUM T_A =+22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		λ^* = 10 MAX ACC NO.= 3
SUBGROUP 5** LEAD TENSION LEAD FATIGUE	SEE NOTE 3 D (2) SEE NOTE 3 D (1)		LTPD = 20 (COMBINED) MAX ACC NO.= 3

* PER MIL-S-19500C TABLE IV

** TESTS TO BE PERFORMED IN SEQUENCE INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V, I_E = 0	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±50% *
DC CURRENT GAIN	hFE	V_{CE} = 1 V, I_C = 10 mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = 1 V, I_C = 10 mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 MILLIMICROAMPERES MAY BE CONSIDERED TO BE 5 MILLIMICROAMPERES FOR CALCULATING PERCENTAGE CHANGE.

REVISION A THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

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DRAWN G. Marto DATE 1-25-63
CHECKED A. Maynard 1-25-63
APPROVAL [illegible] 2-13-63
APPROVAL

NASA APPROVAL W J Rhine 2-13-63

MIT APPROVAL W Kupfer 13 Feb 63

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TRANSISTOR, SILICON, TYPE NPN LOGIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006752
SCALE
WT
SHEET 4 OF 4

B	1006752

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00398		WK
B	REVISED PER TDRR 02815	8/25/63	

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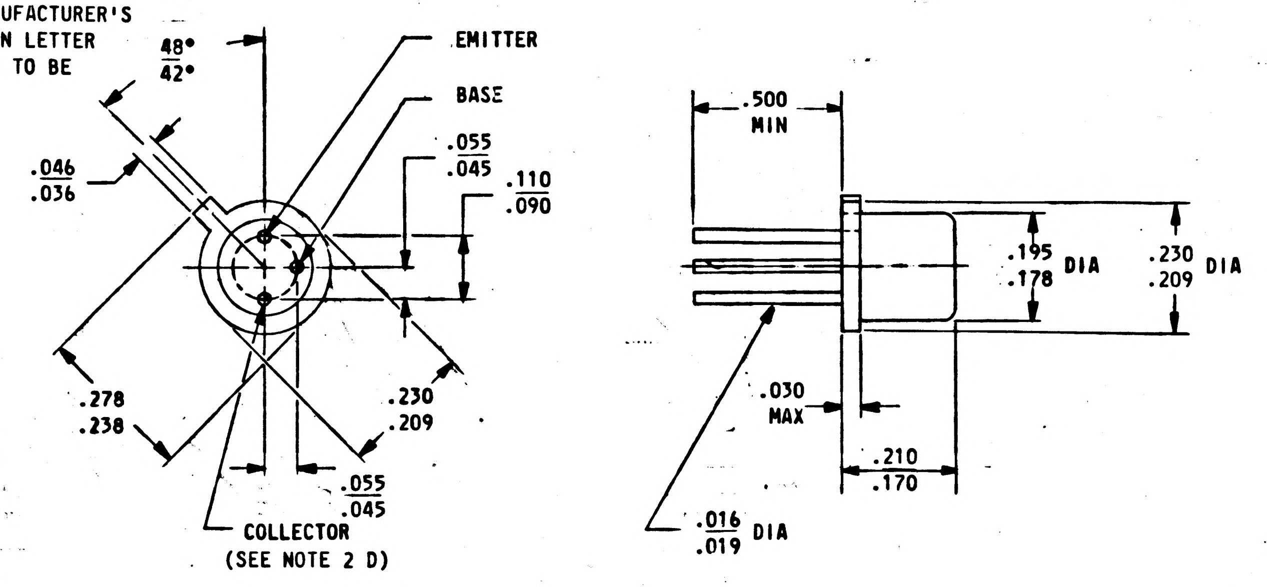
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT +25°C AMBIENT.
     - (1) COLLECTOR TO EMITTER VOLTAGE (VCEO): 15 VOLTS DC
     - (2) COLLECTOR TO BASE VOLTAGE (VCBO): 40 VOLTS DC
     - (3) EMITTER TO BASE VOLTAGE (VEBO): 5 VOLTS DC
     - (4) COLLECTOR CURRENT (IC): 300 MILLIAMPERES
     - (5) POWER DISSIPATION: 1.2 WATTS AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION - CASE, (θ_{JC}): 145° C/WATT.
     - (7) THERMAL RESISTANCE, JUNCTION - AMBIENT, (θ_{JA}): 480° C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER AND THE NUMBER 752. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN,
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-18).
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



B	B	A	A
A	A	A	A
–	–		
SHEET 1	SHEET 2	SHEET 3	SHEET 4

REVISION STATUS OF SHEETS

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT NO 1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

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APPROVAL 2-13-63
APPROVAL

NASA APPROVAL W J Rhine 2-13-63

MIT APPROVAL 13 Feb 63

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TRANSISTOR, SILICON, TYPE NPN LOGIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006752
SCALE NONE
WT
SHEET 1 OF 4

1006752 B

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006752 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00398	2-11/63	WK
B	REVISED PER TDRR 02815	8/28/63	JW

NOTES (CONTINUED):

3. C. **ACCEPTANCE INSPECTION:** PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHOD: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 2.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, $T_{stg} = 300° \pm 5°C$, $72 \begin{smallmatrix}+8\\-4\end{smallmatrix}$ HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 327 MILLIWATTS V_{CE} = 11 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168 \begin{smallmatrix}+12\\-6\end{smallmatrix}$ HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

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CONTRACT

DRAWN A. Marto DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL 13 Feb 63

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TRANSISTOR, SILICON, TYPE; NPN LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006752
SCALE
WT
SHEET 2 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 | 3 | 2 | 1

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1006753	B

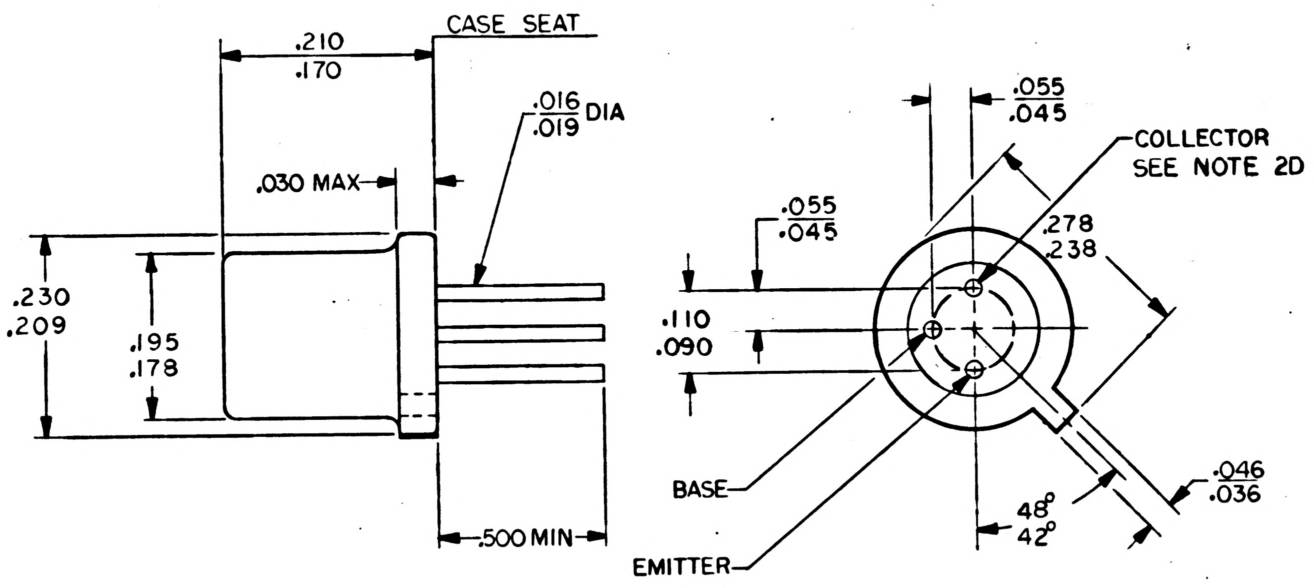
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00399	2-13-65	WK

D

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 15 VOLTS DC.
     - (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 20 VOLTS DC.
     - (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 4 VOLTS DC.
     - (4) COLLECTOR CURRENT (I_C): 500 MILLIAMPERES
     - (5) POWER DISSIPATION: 1.0 WATT AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 175°C/WATT
     - (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 585°C/WATT
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX)
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 753. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

C



2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, PNP.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-18).
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.

B

B	B	B	B
A	A	—	—
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

A

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

MASTER

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APPLICATION	

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
NONE
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NASA APPROVAL W. J. Rhine 2-13-63

MIT APPROVAL 13 Feb 63

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TRANSISTOR, SILICON,
TYPE PNP LOGIC
SPECIFICATION CONTROL DRAWING

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	C	1006753
SCALE NONE	WT	SHEET 1 OF 4

4 | 3 | 2 | 1

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1006753 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	SEE SHEET 2 00061	10-9-62	10/10/62

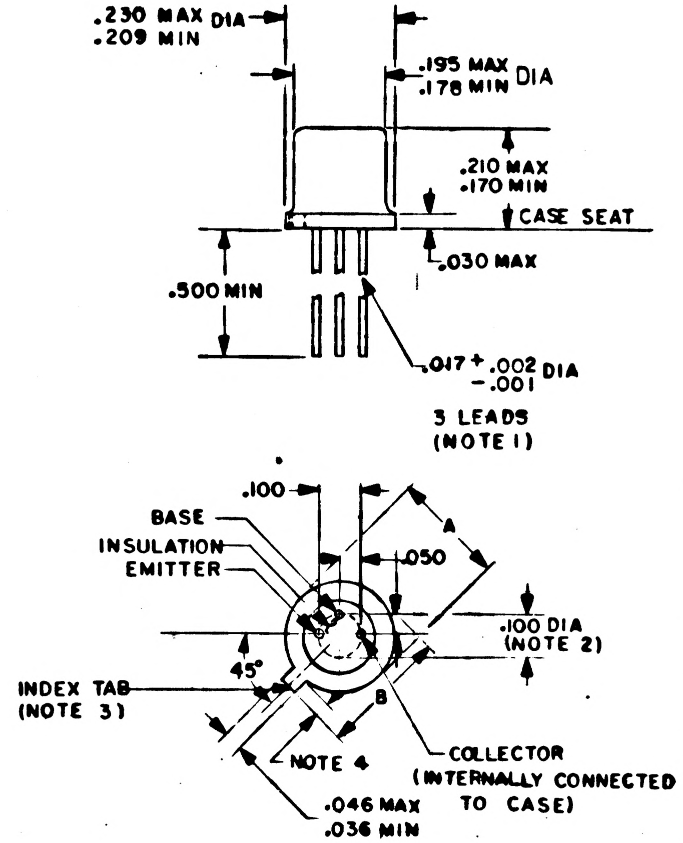
NOTES:

1. GENERAL REQUIREMENTS
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS: SEE SHEET 2.
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, PNP.
   - B. CASE: METAL, SUITABLY PROTECTED TO WITHSTAND ENVIRONMENTAL REQUIREMENTS.
   - C. LEADS: THREE(3) RIGID AND WELDABLE "KOVAR" (PROPRIETARY) CONDUCTORS; GREASE AND OIL FREE, GOLD FLASHED PER ND1002001.

     A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     COLLECTOR: ELECTRICALLY CONNECTED TO CASE (INTERNALLY).

     EACH LEAD SHALL WITHSTAND AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - D. HEADER: SHALL BE HERMETICALLY (GLASS-"KOVAR") SEALED AND IMPERVIOUS TO LIGHT.
   - E. MARKING: PER MIL-S-19500 AND SHALL INCLUDE THE MANUFACTURER'S NAME AND/OR SYMBOL, DATE CODE, AND TYPE NUMBER. THE NASA NO. SHALL APPEAR ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.
3. ENVIRONMENTAL REQUIREMENTS: SHALL MEET THE REQUIREMENTS OF ND1002000.
4. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.



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CLASS B RELEASE TDR No. 00027 **DATE** 9-13-62

REV-A	REV-A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

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LIST OF MATERIALS			

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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FRACTIONS ± — DECIMALS ± — ANGLES ± —
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APPROVAL Eldon C Hall
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00399	2-13-63	WK

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT, WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1×10^{-8} CC/ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 1.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, $T_{stg} = 300° \pm 5°C$, 72^{+8}_{-4} HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 270 MILLIWATTS V_{CE} = -11.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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SIZE C
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00061	10-9-62	WK 10/11/62

DESIGN PARAMETERS AT 25°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
COLLECTOR CUT OFF CURRENT	I_{CBO}	$V_{CB}=15$; $I_E=0$		25	MuA
COLL. CUTOFF CURRENT (150°C)	I_{CBO}	$V_{CB}=15V$; $I_E=0$		15	uA
COLL. BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C=10$ uA; $I_E=0$	20		V
EMITTER BASE REVERSE CURRENT	I_{EBO}	$V_{EB}=3V$; $I_C=0$		0.1	uA
EMITTER BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E=10uA$; $I_C=0$	4		V
COLL. EMITT. SUSTAINING VOLTAGE	V_{CEO} (SUST)	$I_C=10mA$ (PULSED) $I_B=0$	15		V
COLL. EMITT. CURRENT RESISTANCE RETURN	I_{CER}	$V_{CE}=20V$; $R_{BE}=100K$		10	uA
[illegible]		[illegible]			
D.C.CURRENT GAIN	h_{FE}	$I_C=100mA$; $V_{CE}=1V$	20		
D.C.CURRENT GAIN	h_{FE}	$I_C=10mA$; $V_{CE}=1V$	30	90	
D.C.CURRENT GAIN	h_{FE}	$I_C=1mA$; $V_{CE}=1V$	20		
BASE EMITTER SATURATION VOLTAGE	V_{BE} (SAT)	$I_C=10mA$; $I_B=1mA$	0.7	0.9	V
COLL. EMITT. SATURATION VOLTAGE	V_{CE} (SAT)	$I_C=10mA$; $I_B=1mA$		0.25	V
COLL. EMITT. SATURATION VOLTAGE	$V_{CE(SAT)}$	$I_C=300mA$; $I_B=10mA$		0.7	V
THERMAL RESISTANCE	θ_{J-C}			145	°C/W
COLLECTOR CAPACITANCE	C_{ob}	$V_{CB}=10V$; $I_E=0$			
TURN ON TIME	t_{on}	$I_{B1}=1mA$ - $I_{B2}=1mA$ $V_{CC}=3V$; $R_L=300$ $t_W \geq 400nsec.$ 2% duty cycle		65	usec
TURN OFF TIME	t_{off}	$I_{B1}=1mA$ - $I_{B2}=1mA$ $V_{CC}=3V$; $R_L=300$ $t_W \geq 400nsec.$ 2% duty cycle		125	usec

MAXIMUM RATINGS AT 25°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

COLLECTOR TO EMITTER VOLTAGE	$R_{BE}=\infty$	V_{CEO}	15
COLLECTOR TO BASE VOLTAGE		V_{CBO}	20
EMITTER TO BASE VOLTAGE		V_{EBO}	4
D.C. COLLECTOR CURRENT		I_C	0.5
TOTAL POWER DISSIPATION (CASE AT 25°C)		P_T	1.2W
THERMAL RESISTANCE - JUNCTION TO CASE		θ_{J-C}	145°C/W
THERMAL RESISTANCE - JUNCTION TO AMBIENT		θ_{J-A}	480°C/W
JUNCTION TEMPERATURE RANGE, OPERATING			−65°C TO 200°C
JUNCTION TEMPERATURE RANGE, STORAGE			−65°C TO 300°C
LEAD TEMPERATURE (SOLDERING)			+ 300°C

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CLASS B RELEASE TDR No. 00057 DATE 9-13-62

INCHES
0 1 2
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LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING
MATERIAL #
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SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00399	2-13-63	WK

TABLE II

ACCEPTANCE INSPECTION							
TEST	SYMBOL	TEST CONDITIONS	LIMIT		UNITS	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO=3	LTPD* = 10 MAX ACC NO=3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = -15$ V; $I_E = 0$		25	muA	100%	LTPD* = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	$V_{CB} = -15$ V; $I_E = 0$		15	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C = -10$ uA; $I_E = 0$	20		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	$V_{EB} = -3$ V; $I_C = 0$		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E = -10$ uA; $I_C = 0$	4		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	$I_C = -10$ mA PULSED $I_B = 0$					
COLLECTOR-EMITTER CURRENT RES.RETURN	I_{CER}	$V_{CE} = -20$ V; $R_{BE} = 100$ K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	$V_{BE} = -0.45$; $V_{CE} = -15$ V		1	uA		
DC CURRENT GAIN	h_{FE}	$I_C = -100$ mA; $V_{CE} = -1$ V	15				
DC CURRENT GAIN	hFE	$I_C = -10$ mA; $V_{CE} = -1$ V	30	90			
DC CURRENT GAIN	hFE	$I_C = -1$ mA; $V_{CE} = -1$ V	20				
BASE-EMITTER SATURATION VOLTAGE	V_{BE} SAT	$I_C = -10$ mA; $I_B = -1$ mA	0.7	0.9	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE}(sat)$	$I_C = -10$ mA; $I_B = -1$ mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE}(sat)$	$I_C = -100$ mA; $I_V = -10$ mA		0.7	V		
COLLECTOR CAPACITANCE	C_{ob}	$V_{CB} = -10$ V; $I_E = 0$; F=.14 mc SEE NOTE 3 D (4)		10	PF		
TURN ON TIME	t_{on}	$I_{B1} = -1$ mA; $I_{B2} = -1$ mA $V_{CC} = -3$ V; $R_L = 300\ \Omega$ $t_w \geq 400$ nsec 2% DUTY CYCLE		120	NSEC		
TURN OFF TIME	t_{off}	$I_{B1} = -1$ mA; $I_{B2} = -1$ mA $V_{CC} = -3$ V; $R_L = 300\ \Omega$ $t_w \geq 400$ nsec 2% DUTY CYCLE		300	NSEC		

* LTPD PER MIL-S-19500C, TABLE IV

REVISION B THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
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MATERIAL SEE NOTES

HEAT TREATMENT NONE

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SIZE C
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SHEET 3 OF 4

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00399	2-13-63	

TABLE III

QUALITY DEMONSTRATION TESTS

TEST	TEST CONDITION	LOT	
		1 TO 500	OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2** THERMAL SHOCK SEAL TEST	METHOD 1056, CONDITION B (+200°C TO -65°C, 5 CYCLES) SEE NOTE 3 D (3)		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031 Tstg = 200° ± 5°C, 1000 HOURS METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026 $P = 270$ MILLIWATTS $V_{CE} = 11$ VOLTS MINIMUM $T_A = +22°C$ MIN IN FREE AMBIENT AIR $t = 1000$ HOURS		λ* = 10 MAX ACC NO.= 3
SUBGROUP 5** LEAD TENSION LEAD FATIGUE	SEE NOTE 3 D (2) SEE NOTE 3 D (1)		LTPD = 20 (COMBINED) MAX ACC NO.= 3

* PER MIL-S-19500C TABLE IV

** TESTS TO BE PERFORMED IN ORDER INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = -15$ V, $I_C = 0$	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	$V_{EB} = -3$ V, $I_C = 0$	±50% *
DC CURRENT GAIN	hFE	$V_{CE} = -1$ V, $I_C = -10$ mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = -15$ V, $I_E = 0$	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	$V_{EB} = -3$ V, $I_C = 0$	±100% *
DC CURRENT GAIN	hFE	$V_{CE} = -1$ V, $I_C = -10$ mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 MILLIMICROAMPERES MAY BE CONSIDERED TO BE 5 MILLIMICROAMPERES FOR CALCULATING PERCENTAGE CHANGE.

REVISION B THIS SHEET ADDED

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NEXT ASSY	USED ON
APPLICATION	

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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CODE IDENT NO. SIZE C NASA DRAWING NO. 1006753
SCALE WT SHEET 4 OF 4

MASTER

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1006753 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00399	2-13-63	WK
C	REVISED PER TDRR 00633	3-22-63	WK

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

   B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
      (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 15 VOLTS DC.
      (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 20 VOLTS DC.
      (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 4 VOLTS DC.
      (4) COLLECTOR CURRENT (I_C): 500 MILLIAMPERES
      (5) POWER DISSIPATION: 1.0 WATT AT +25°C CASE TEMPERATURE.
      (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 175°C/WATT
      (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 585°C/WATT

   C. TEMPERATURE:
      (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C
      (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C
      (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX)

   D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 753. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:

   A. SEMICONDUCTOR: SILICON, PNP.

   B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-18).

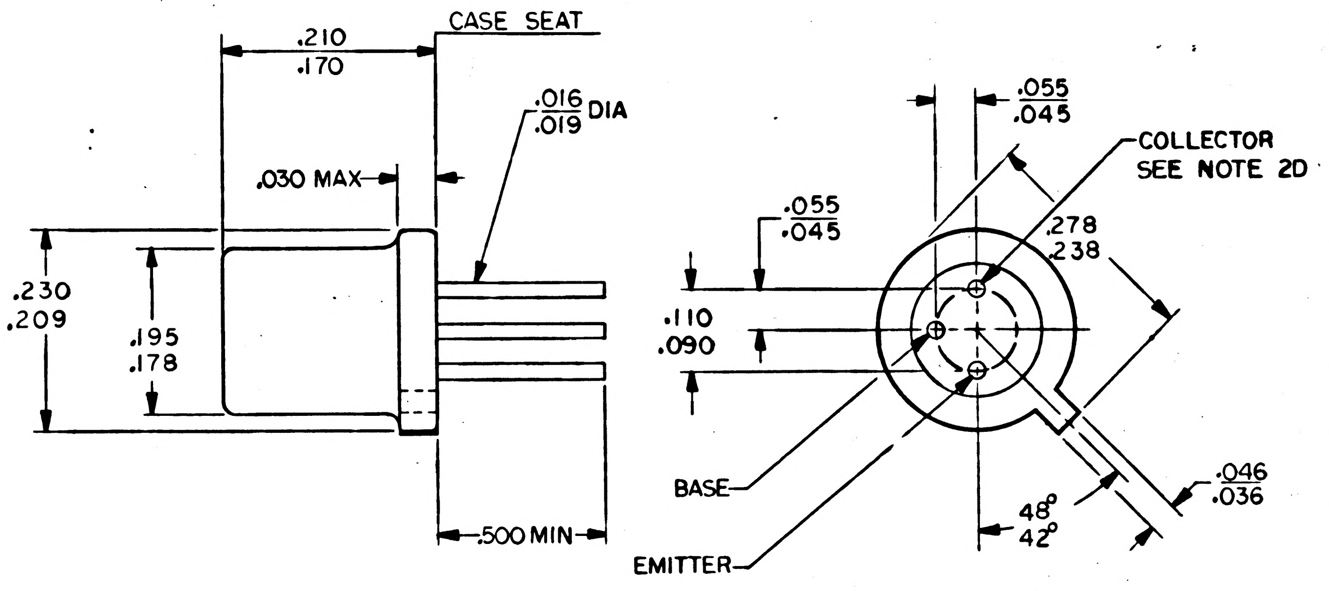
   C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

   D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:

   A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

   B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



C	B	C	B
B	B	B	B
A	A	—	—
SHEET 1	SHEET 2	SHEET 3	SHEET 4

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT NO 1002034

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

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DWG. NO. CONTRACT

DRAWN A. Mats DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL 2-13-63
APPROVAL

NASA APPROVAL W J Rhine 2-13-63

MIT APPROVAL 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE PNP LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006753
SCALE NONE
WT
SHEET 1 OF 4

1006753 C

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00399	2-13-63	WK
C	REVISED PER TDRR 00633	3-20-63	WR

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	TEST CONDITIONS	LIMIT MIN	LIMIT MAX	UNITS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO=3	LTPD* = 10 MAX ACC NO=3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} =-15 V; I_E = 0		25	muA	100%	LTPD* = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} =-15 V; I_E = 0		15	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C =-10 uA; I_E = 0	20		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} =-3 V; I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E =-10 uA; I_C = 0	4		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	I_C =-10 mA PULSED I_B = 0	15				
COLLECTOR-EMITTER CURRENT RES.RETURN	I_{CER}	V_{CE} =-20 V; R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE} =-0.45; V_{CE} = -15 V		1	uA		
DC CURRENT GAIN	h_{FE}	I_C =-100 mA; V_{CE} =-1 V	15				
DC CURRENT GAIN	hFE	I_C =-10 mA; V_{CE} =-1 V	30	90			
DC CURRENT GAIN	hFE	I_C =-1 mA; V_{CE} =-1 V	20				
BASE-EMITTER SATURATION VOLTAGE	V_{BE} SAT	I_C =-10 mA; I_B =-1 mA	0.7	0.9	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE}(sat)	I_C =-10 mA; I_B =-1 mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE}(sat)	I_C =-100 mA; I_Y =-10 mA		0.7	V		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} =-10 V; I_E=0; F=.14 mc SEE NOTE 3 D (4)		10	PF		
TURN ON TIME	t_{on}	I_{B1} =-1 mA; I_{B2} =-1 mA V_{CC} =-3 V; R_L = 300 Ω $t_w \geq$ 400 nsec 2% DUTY CYCLE		120	NSEC		
TURN OFF TIME	t_{off}	I_{B1} =-1 mA; I_{B2} =-1 mA V_{CC} =-3 V; R_L = 300 Ω $t_w \geq$ 400 nsec 2% DUTY CYCLE		300	NSEC		

* LTPD PER MIL-S-19500C, TABLE IV

REVISION B THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

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DRAWN A. Marts DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W J Rhine 2-13-63
MIT APPROVAL 13 Feb 63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006753
SCALE	WT	SHEET 3 OF 4

MASTER

INCHES
0 1 2
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1006753 D

REVISIONS			
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B	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00399	2-13-63	WK
C	REVISED PER TDRR 00633	3-22-63	WK.
D	REVISED PER TDRR 02818	8/28/63	

NOTES:

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(5) POWER DISSIPATION: 1.0 WATT AT +25°C CASE TEMPERATURE.

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(1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C

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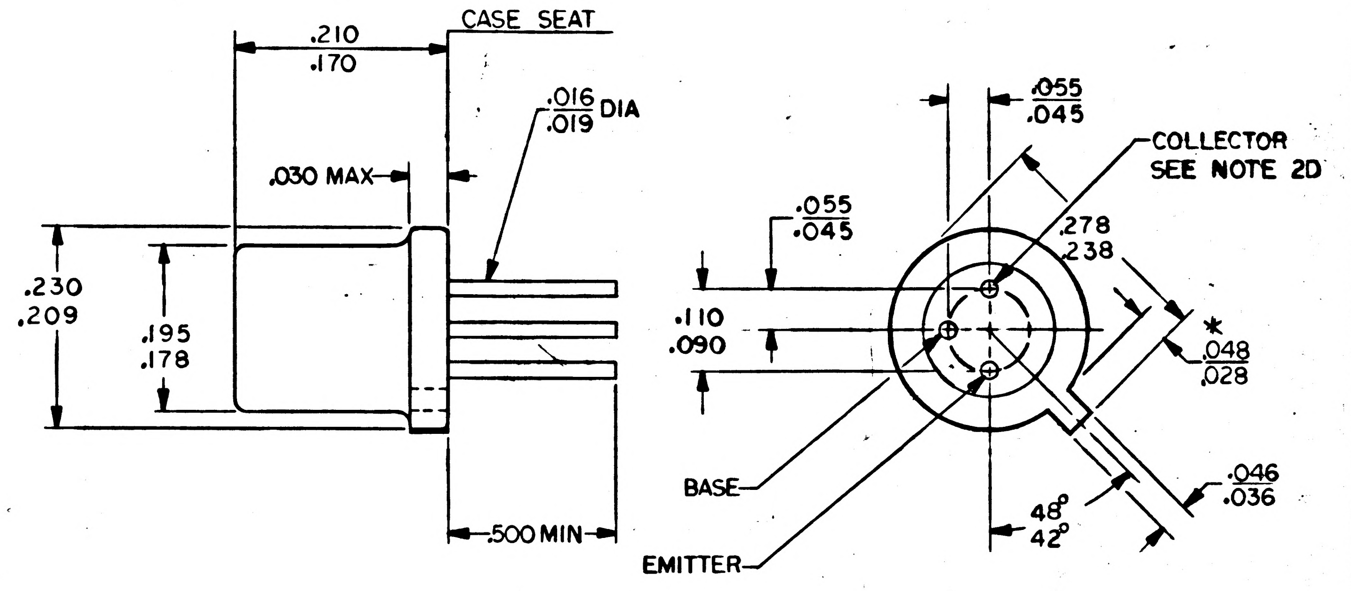

D	D	C	B
C	B	C	B
B	B	B	B
A	A	—	—
SHEET 1	SHEET 2	SHEET 3	SHEET 4

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

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DRAWN A. Martz DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL 2-13-63
APPROVAL

NASA APPROVAL W J Rhine 2-13-63

MIT APPROVAL 13 Feb 63

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SPECIFICATION CONTROL DRAWING

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SIZE C
NASA DRAWING NO. 1006753
SCALE NONE
WT
SHEET 1 OF 4

INCHES
0 1 2
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D	REVISED PER TDRR 02818	8/28/63	

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT, WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1×10^{-8} CC/ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 2.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, $T_{stg} = 300° \pm 5°C$, $72 ^{+8}_{-4}$ HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 270 MILLIWATTS V_{CE} = -11.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168 ^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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TRANSISTOR, SILICON,
TYPE PNP LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006753
SCALE
WT
SHEET 2 OF 4

INCHES
0 1 2
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1006753

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

DESIGN PARAMETERS AT 25°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
COLLECTOR CUT OFF CURRENT	I_{CBO}	$V_{CB}=15$; $I_E=0$		25	MuA
COLL. CUTOFF CURRENT (150°C)	I_{CBO}	$V_{CB}=15V$; $I_E=0$		15	uA
COLL. BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C=10$ uA; $I_E=0$	20		V
EMITTER BASE REVERSE CURRENT	I_{EBO}	$V_{EB}=3V$; $I_C=0$		0.1	uA
EMITTER BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E=10uA$; $I_C=0$	4		V
COLL. EMITT. SUSTAINING VOLTAGE	V_{CEO} (SUST)	$I_C=10mA$ (PULSED) $I_B=0$	15		V
COLL. EMITT. CURRENT RESISTANCE RETURN	I_{CER}	$V_{CE}=20V$; $R_{BE}=100K$		10	uA
D.C.CURRENT GAIN	h_{FE}	$I_C=100mA$; $V_{CE}=1V$	20		
D.C.CURRENT GAIN	h_{FE}	$I_C=10mA$; $V_{CE}=1V$	30	90	
D.C.CURRENT GAIN	h_{FE}	$I_C=1mA$; $V_{CE}=1V$	20		
BASE EMITTER SATURATION VOLTAGE	V_{BE} (SAT)	$I_C=10mA$; $I_B=1mA$	0.7	0.9	V
COLL. EMITT. SATURATION VOLTAGE	V_{CE} (SAT)	$I_C=10mA$; $I_B=1mA$		0.25	V
COLL. EMITT. SATURATION VOLTAGE	$V_{CE(SAT)}$	$I_C=100mA$; $I_B=10mA$		0.7	V
THERMAL RESISTANCE	θ_{J-C}			145	°C/W
COLLECTOR CAPACITANCE	C_{ob}	$V_{CB}=10V$; $I_E=0$			
TURN ON TIME	t_{on}	$I_{B1}=1mA$ - $I_{B2}=1mA$ $V_{CC}=3V$; $R_L=300$ $t_W \geq 400$nsec. 2% duty cycle		65	usec
TURN OFF TIME	t_{off}	$I_{B1}=1mA$ - $I_{B2}=1mA$ $V_{CC}=3V$; $R_L=300$ $t_W \geq 400$nsec, 2% duty cycle		125	usec

MAXIMUM RATINGS AT 25°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

COLLECTOR TO EMITTER VOLTAGE	$R_{BE}=\infty$	V_{CEO}	15
COLLECTOR TO BASE VOLTAGE		V_{CBO}	20
EMITTER TO BASE VOLTAGE		V_{EBO}	4
D.C. COLLECTOR CURRENT		I_C	0.5
TOTAL POWER DISSIPATION (CASE AT 25°C)		P_T	1.2W
THERMAL RESISTANCE - JUNCTION TO CASE		θ_{J-C}	145°C/W
THERMAL RESISTANCE - JUNCTION TO AMBIENT		θ_{J-A}	480°C/W
JUNCTION TEMPERATURE RANGE, OPERATING			− 65°C TO 200°C
JUNCTION TEMPERATURE RANGE, STORAGE			− 65° TO 300°C
LEAD TEMPERATURE (SOLDERING)			+ 300°C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 **DATE** 9-13-62

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DWG. NO. CONTRACT
DRAWN R. CHIN DATE 7-12-62
CHECKED
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL 9-17-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE; PNP LOGIC
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SCALE NONE WT — SHEET 2 OF 2

1006753

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006754 (N)

REVISIONS

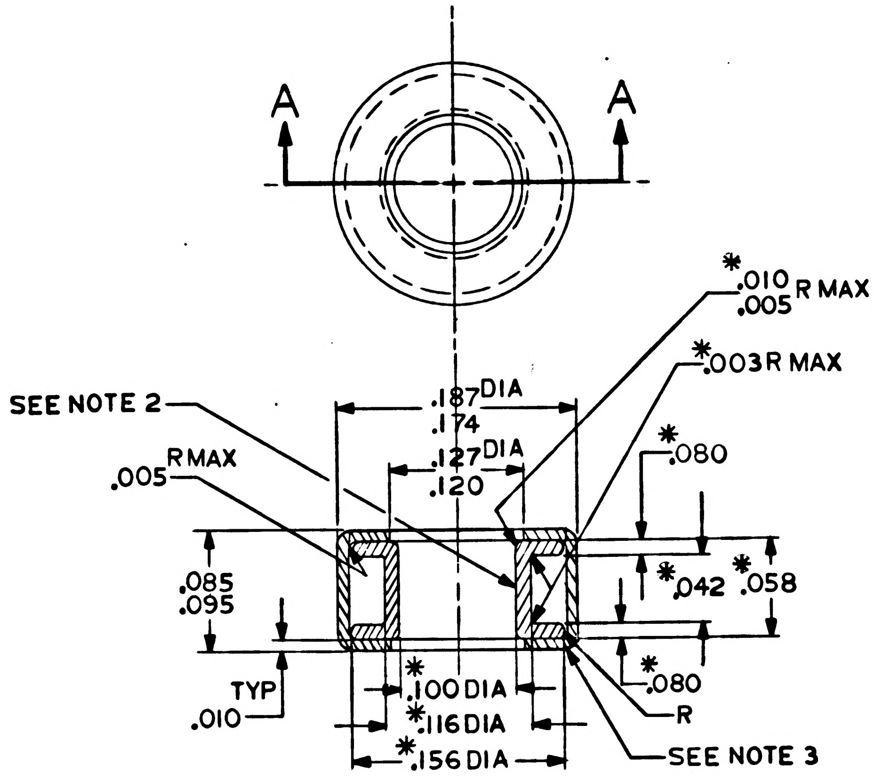
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 4 PER TDRR 00433	2-20-63	wjs wil

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-4-62

REFERENCE:

1. * DENOTES SPOOL DIMENSIONS



NOTES:

1. FOR TEST SPECS SEE NASA DOCUMENT ND1002008
2. MATERIAL: 303 SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. MATERIAL: NYLON PER MIL-P-20693 TYPE IV
4. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

NOMINAL CORE CHARACTERISTICS

RAMP SLOPE	T_p u sec	T_s u sec	V_I mV	V_O mV
200mA / u sec	2.2	1.9	110	—
400mA / u sec	1.3	1.3	160	—
1000mA / u sec	—	—	—	8

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT #
FINAL FINISH #

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN OCONNELL DATE 8-4-62
CHECKED Karl Sharsky 10-3-62
APPROVAL D Duggan
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 10-4-62
MIT APPROVAL W Kupfer 10/4/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, II MAXWELL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006754
SCALE NONE WT SHEET 1 OF 1

1006754

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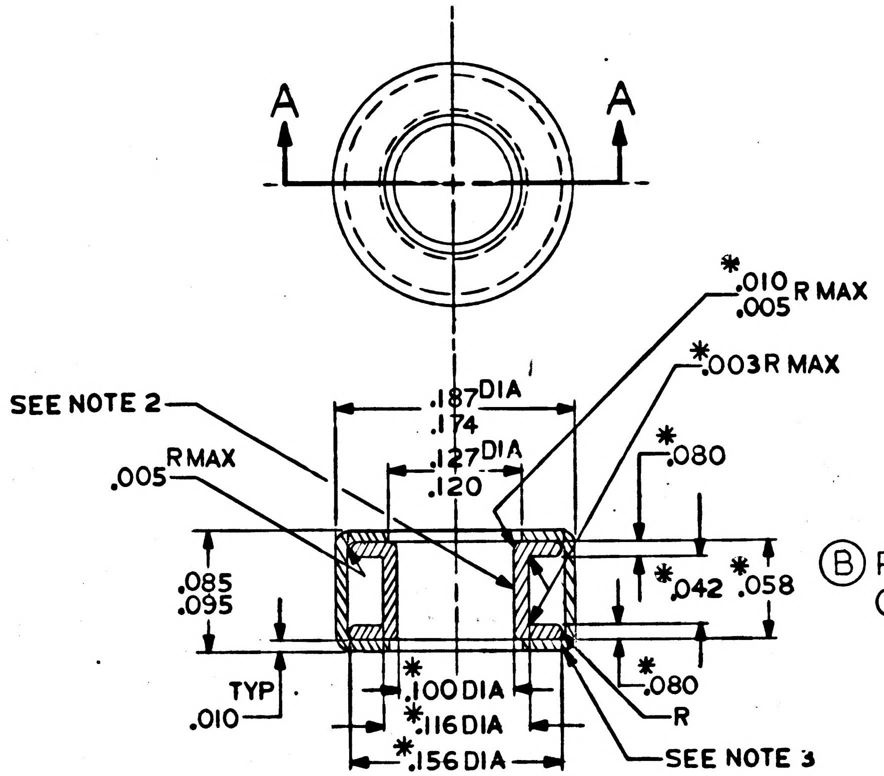
1006754 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 4 PER TDRR 00433	2-20-63	WR
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-4-62

REFERENCE:
1. * DENOTES SPOOL DIMENSIONS



Ⓑ REPLACED WITH CHANGE BY REV C

NOTES:
1. FOR TEST SPECS SEE NASA DOCUMENT ND1002008
2. MATERIAL: 303 SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. MATERIAL: NYLON PER MIL-P-20693 TYPE IV
4. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

NOMINAL CORE CHARACTERISTICS

RAMP SLOPE	T_p u sec	T_s u sec	V_1 mV	V_0 mV
200mA / u sec	2.2	1.9	110	—
400mA / u sec	1.3	1.3	160	—
1000mA / u sec	—	—	—	8

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±# DECIMALS ±# ANGLES ±#
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT #
FINAL FINISH #

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN OCONNELL DATE 8-4-62
CHECKED 10-8-62
APPROVAL
APPROVAL
NASA APPROVAL 10-4-62
MIT APPROVAL 10/4/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, II MAXWELL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006754
SCALE NONE WT SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006754

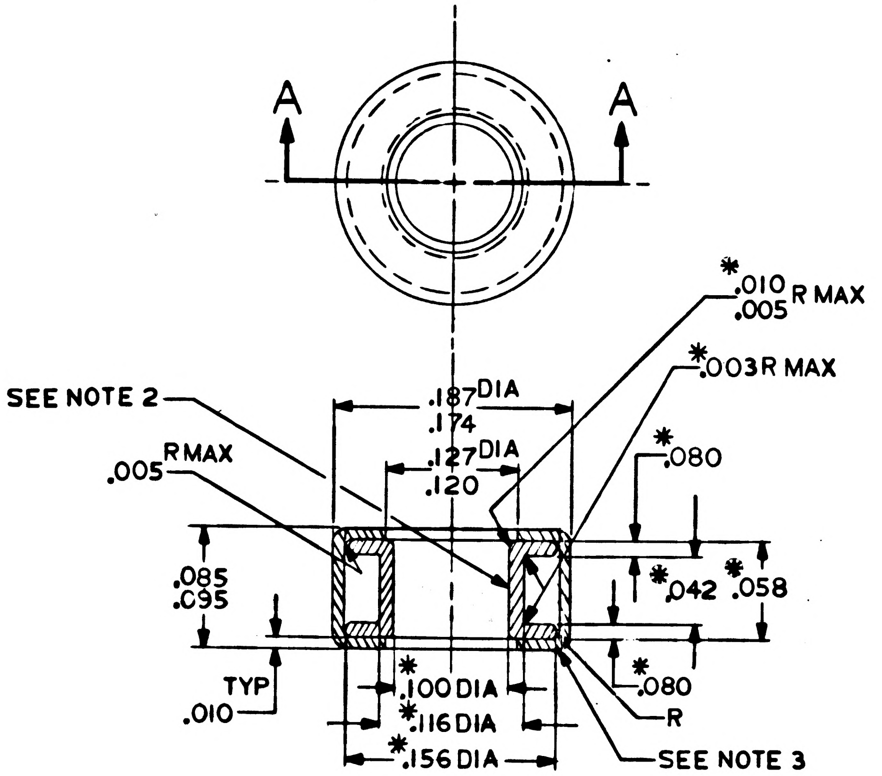
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-4-62

REFERENCE:
1. * DENOTES SPOOL DIMENSIONS

NOTES:
1. FOR TEST SPECS SEE NASA DOCUMENT ND 1002008
2. MATERIAL: 303 SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. MATERIAL: NYLON PER MIL-P-20693 TYPE IV



NOMINAL CORE CHARACTERISTICS

RAMP SLOPE	Tp u sec	Ts u sec	V1 mV	V0 mV
200mA / u sec	2.2	1.9	110	—
400mA / u sec	1.3	1.3	160	—
1000mA / u sec	—	—	—	8

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN OCONNELL DATE 8-4-62
CHECKED 10-3-62
APPROVAL
APPROVAL Eldon C. Hall
NASA APPROVAL 10-4-62
MIT APPROVAL 10/4/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, II MAXWELL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006754
SCALE NONE WT SHEET 1 C

1006754

1006755

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	TAKEN FROM BUWEPS DWG. 2318867		
A	ADDED PROCUREMENT NOTE 7 PER TDRR 00433	2-2063	WR

(M)

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SPRAGUE TYPE 250 D PER DATA SOURCE NOTED EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ELECTRICAL RATINGS: PER TABLE II ON SHEET 2.
   - C. CAPACITANCE AT 120 CPS @ 25°C: PER SHEET 2.
     CAPACITANCE TOLERANCE: ± 10% @ 120 CPS @ 25°C.
   - D. MAXIMUM DISSIPATION FACTOR
     - AT -80°C: 0.08
     - AT +25°C: 0.06
     - AT +85°C: 0.08
     - AT +125°C: 0.09
   - E. OPERATING TEMPERATURE RANGE: -80°C TO +85°C.
   - F. MAX D.C. LEAKAGE CURRENT: .05 UA/UF - VOLT, BUT IN NO CASE NEED THE LEAKAGE CURRENT BE LESS THAN 1 UA.
2. CONSTRUCTION REQUIREMENTS:
   - A. INSULATING SLEEVE: MYLAR, CAPABLE OF WITHSTANDING 2000 VDC FOR 1 MIN ± 5 SEC.
   - B. LEADS: UNITS SHALL HAVE WELDABLE NICKEL LEADS PER ND 1015400.

     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS, UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - C. DIMENSIONS AND TOLERANCES: PER TABLE I ON SHEET 1 AND SKETCH.
   - D. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, VOLTAGE AND CAPACITANCE RATING AND POLARITY.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA NUMBER, DASH NUMBER AND REVISION LETTER.
3. ENVIRONMENTAL REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE ENVIRONMENTAL REQUIREMENTS OF ND1002000.
4. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS OF ND1015404 SECTION .
5. BURN-IN (BY SUPPLIER):
   - A. ALL CAPACITORS SHALL BE SUBJECTED TO A 250 HOUR BURN-IN PERIOD AT RATED VOLTAGE AND +85°C. UNDER THESE CONDITIONS THE FOLLOWING RESULTS SHALL BE OBTAINED. PRE AND POST BURN-IN DATA REPRESENTED BY THESE RESULTS SHALL BE SUPPLIED WITH ALL CAPACITORS SHIPPED. DATA SHALL CONSIST OF MEASUREMENTS FOR EACH UNIT OF THE LOT.
     - (1) THE CAPACITANCE SHALL NOT EXCEED THE INITIAL REQUIREMENTS OF THE APPLICABLE DRAWING.
     - (2) THE LEAKAGE CURRENT AND DISSIPATION FACTOR SHALL NOT EXCEED THE INITIAL LIMITS SPECIFIED BY THE APPLICABLE DRAWING.
6. INTERPRET DRAWING PER MIL-D-70327.
7. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

REV- A	REV-	REV-
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

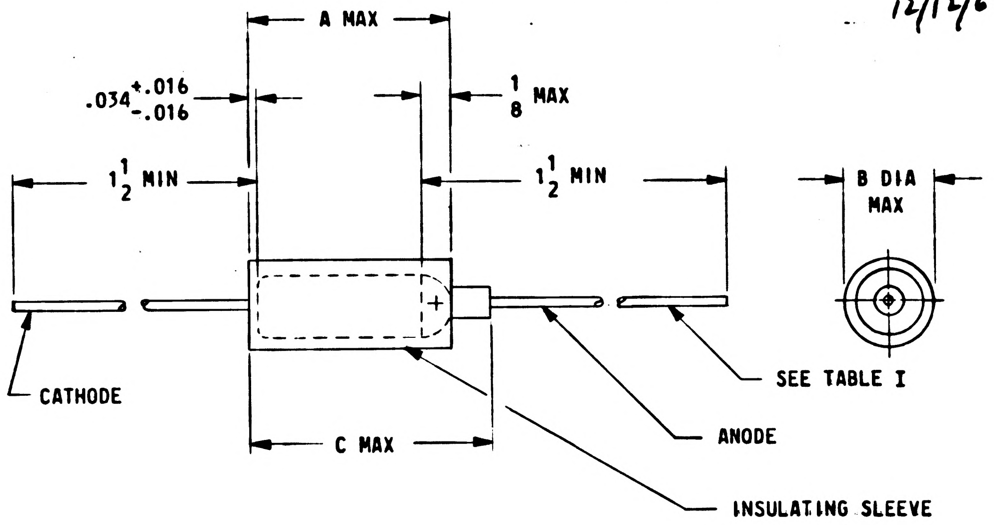

TABLE I

CASE SIZE	NOM LEAD SIZE		DIMENSIONS		
	AWG	DIA	A MAX	B MAX	C MAX
A	24	.020	.353	.151	.503
B	24	.020	.541	.201	.691
C	22	.0253	.753	.305	.903
D	22	.0253	.853	.367	1.003

ORIGINAL SOURCE OF SUPPLY:

SPRAGUE ELECTRIC COMPANY
NORTH ADAMS, MASSACHUSETTS
CODE IDENT NO. 56289

DATA SOURCE:

SPRAGUE SPECIFICATION
NO'S DV-102A AND DV-103
DATED APRIL 14, 1961

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 29 Nov 62
CHECKED H. Maynard 4 DEC 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 1 OF 3

1006755

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
(M) –	TAKEN FROM BUWEPS DWG. 2318867		
(1) A	ADDED PROCUREMENT NOTE 7 PER TDRR 00433	2-20-63	WR
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WR

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SPRAGUE TYPE 250 D PER DATA SOURCE NOTED EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ELECTRICAL RATINGS: PER TABLE II ON SHEET 2.
   - C. CAPACITANCE AT 120 CPS @ 25°C: PER SHEET 2.
CAPACITANCE TOLERANCE: ± 10% @ 120 CPS @ 25°C.
   - D. MAXIMUM DISSIPATION FACTOR

     AT -80°C: 0.08
     AT +25°C: 0.06
     AT +85°C: 0.08
     AT +125°C: 0.09
   - E. OPERATING TEMPERATURE RANGE: -80°C TO +85°C.
   - F. MAX D.C. LEAKAGE CURRENT: .05 UA/UF - VOLT, BUT IN NO CASE NEED THE LEAKAGE CURRENT BE LESS THAN 1 UA.
2. CONSTRUCTION REQUIREMENTS:
   - A. INSULATING SLEEVE: MYLAR, CAPABLE OF WITHSTANDING 2000 VDC FOR 1 MIN ± 5 SEC.
   - B. LEADS: UNITS SHALL HAVE WELDABLE NICKEL LEADS PER ND 1015400.

     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS, UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - C. DIMENSIONS AND TOLERANCES: PER TABLE I ON SHEET 1 AND SKETCH.
   - D. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, VOLTAGE AND CAPACITANCE RATING AND POLARITY.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA NUMBER, DASH NUMBER AND REVISION LETTER.
3. ENVIRONMENTAL REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE ENVIRONMENTAL REQUIREMENTS OF ND1002000.
4. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS OF ND1015404 SECTION .
5. BURN-IN (BY SUPPLIER):
   - A. ALL CAPACITORS SHALL BE SUBJECTED TO A 250 HOUR BURN-IN PERIOD AT RATED VOLTAGE AND +85°C. UNDER THESE CONDITIONS THE FOLLOWING RESULTS SHALL BE OBTAINED. PRE AND POST BURN-IN DATA REPRESENTED BY THESE RESULTS SHALL BE SUPPLIED WITH ALL CAPACITORS SHIPPED. DATA SHALL CONSIST OF MEASUREMENTS FOR EACH UNIT OF THE LOT.
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6. INTERPRET DRAWING PER MIL-D-70327.
7.
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REV-B	REV-	REV-
REV- A	REV-	REV-
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

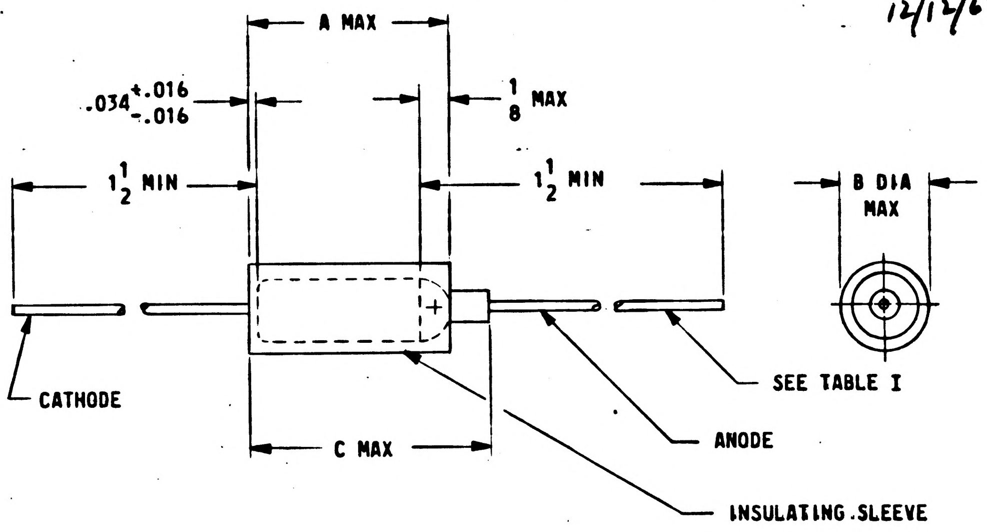

TABLE I

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	AWG	DIA	A MAX	B MAX	C MAX
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B	24	.020	.541	.201	.691
C	22	.0253	.753	.305	.903
D	22	.0253	.853	.367	1.003

ORIGINAL SOURCE OF SUPPLY:

SPRAGUE ELECTRIC COMPANY
NORTH ADAMS, MASSACHUSETTS
CODE IDENT NO. 56289

DATA SOURCE:

SPRAGUE SPECIFICATION
NO'S DV-102A AND DV-103
DATED APRIL 14, 1961

MASTER

(B) REPLACED WITH CHANGE BY REV C

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Gary Wheeler DATE 29 Nov 62
CHECKED H. Maynard 4 DEC 62
APPROVAL E C Hall 11 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006755

SCALE NONE WT SHEET 1 OF 3

1006755 C

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

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   - C. CAPACITANCE AT 120 CPS @ 25°C: PER SHEET 2.
     CAPACITANCE TOLERANCE: ± 10% @ 120 CPS @ 25°C.
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     - AT -80°C: 0.08
     - AT +25°C: 0.06
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     - AT +125°C: 0.09
   - E. OPERATING TEMPERATURE RANGE: -80°C TO +85°C.
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   - D. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, VOLTAGE AND CAPACITANCE RATING AND POLARITY.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA NUMBER, DASH NUMBER AND REVISION LETTER.
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4. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS OF ND1015404 SECTION
5. BURN-IN (BY SUPPLIER):
   - A. ALL CAPACITORS SHALL BE SUBJECTED TO A 250 HOUR BURN-IN PERIOD AT RATED VOLTAGE AND +85°C. UNDER THESE CONDITIONS THE FOLLOWING RESULTS SHALL BE OBTAINED. PRE AND POST BURN-IN DATA REPRESENTED BY THESE RESULTS SHALL BE SUPPLIED WITH ALL CAPACITORS SHIPPED. DATA SHALL CONSIST OF MEASUREMENTS FOR EACH UNIT OF THE LOT.
     - (1) THE CAPACITANCE SHALL NOT EXCEED THE INITIAL REQUIREMENTS OF THE APPLICABLE DRAWING.
     - (2) THE LEAKAGE CURRENT AND DISSIPATION FACTOR SHALL NOT EXCEED THE INITIAL LIMITS SPECIFIED BY THE APPLICABLE DRAWING.
6. INTERPRET DRAWING PER MIL-D-70327.

REV-C	REV-	REV-
REV- A	REV-	REV-
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

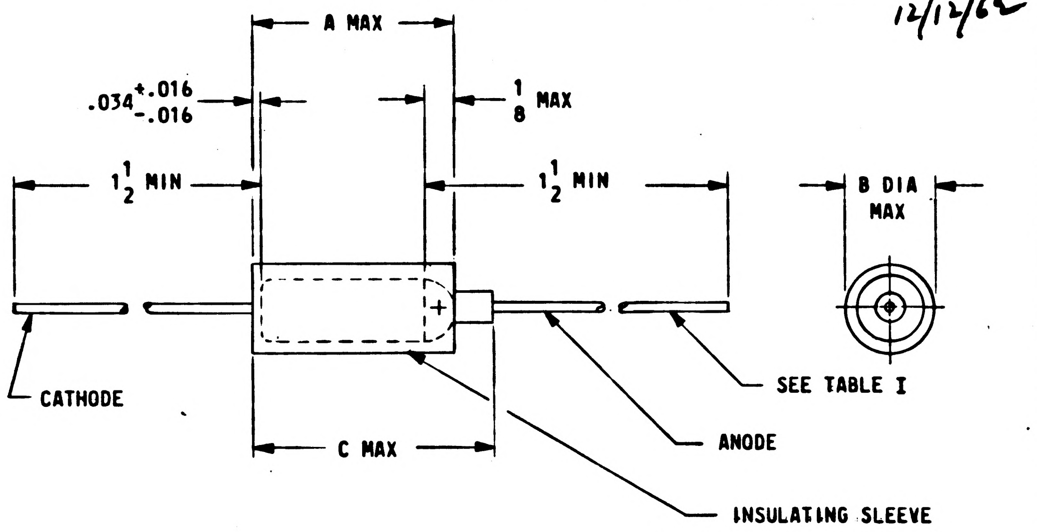

TABLE I

CASE SIZE	NOM LEAD SIZE		DIMENSIONS		
	AWG	DIA	A MAX	B MAX	C MAX
A	24	.020	.353	.151	.503
B	24	.020	.541	.201	.691
C	22	.0253	.753	.305	.903
D	22	.0253	.853	.367	1.003

ORIGINAL SOURCE OF SUPPLY:

SPRAGUE ELECTRIC COMPANY
NORTH ADAMS, MASSACHUSETTS
CODE IDENT NO. 56289

DATA SOURCE:

SPRAGUE SPECIFICATION
NO'S DV-102A AND DV-103
DATED APRIL 14, 1961

MASTER

Ⓒ REPLACES REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ~~#~~ DECIMALS ± ~~#~~ ANGLES ± ~~#~~
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 29 Nov 62
CHECKED A. Maynard 4 DEC 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL [illegible] 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 1 OF 3

MASTER

1006755 C

D	1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REPLACED BY REV E WITH CHANGES PER TDRR 01161	6 May 63	

(M)

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. SPRAGUE TYPE 250 D PER DATA SOURCE NOTED EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ELECTRICAL RATINGS: PER TABLE II ON SHEET 2.
   - C. CAPACITANCE AT 120 CPS @ 25°C: PER SHEET 2. CAPACITANCE TOLERANCE: ± 10% @ 120 CPS @ 25°C.
   - D. MAXIMUM DISSIPATION FACTOR

     AT -80°C: 0.08
     AT +25°C: 0.06
     AT +85°C: 0.08
     AT +125°C: 0.09
   - E. OPERATING TEMPERATURE RANGE: -80°C TO +85°C.
   - F. MAX D.C. LEAKAGE CURRENT: .05 UA/UF - VOLT, BUT IN NO CASE NEED THE LEAKAGE CURRENT BE LESS THAN 1 UA.
2. CONSTRUCTION REQUIREMENTS:
   - A. INSULATING SLEEVE: MYLAR, CAPABLE OF WITHSTANDING 2000 VDC FOR 1 MIN ± 5 SEC.
   - B. LEADS: UNITS SHALL HAVE WELDABLE NICKEL LEADS PER ND 1015400.

     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS, UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - C. DIMENSIONS AND TOLERANCES: PER TABLE I ON SHEET 1 AND SKETCH.
   - D. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, VOLTAGE AND CAPACITANCE RATING AND POLARITY.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA NUMBER, DASH NUMBER AND REVISION LETTER.
3. ENVIRONMENTAL REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE ENVIRONMENTAL REQUIREMENTS OF ND1002000.
4. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS OF ND1015404 SECTION
5. BURN-IN (BY SUPPLIER):
   - A. ALL CAPACITORS SHALL BE SUBJECTED TO A 250 HOUR BURN-IN PERIOD AT RATED VOLTAGE AND +85°C. UNDER THESE CONDITIONS THE FOLLOWING RESULTS SHALL BE OBTAINED. PRE AND POST BURN-IN DATA REPRESENTED BY THESE RESULTS SHALL BE SUPPLIED WITH ALL CAPACITORS SHIPPED. DATA SHALL CONSIST OF MEASUREMENTS FOR EACH UNIT OF THE LOT.
     - (1) THE CAPACITANCE SHALL NOT EXCEED THE INITIAL REQUIREMENTS OF THE APPLICABLE DRAWING.
     - (2) THE LEAKAGE CURRENT AND DISSIPATION FACTOR SHALL NOT EXCEED THE INITIAL LIMITS SPECIFIED BY THE APPLICABLE DRAWING.
6. INTERPRET DRAWING PER MIL-D-70327.

REV-C	REV-	REV-
REV- A	REV-	REV-
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 **DATE** 12/12/62

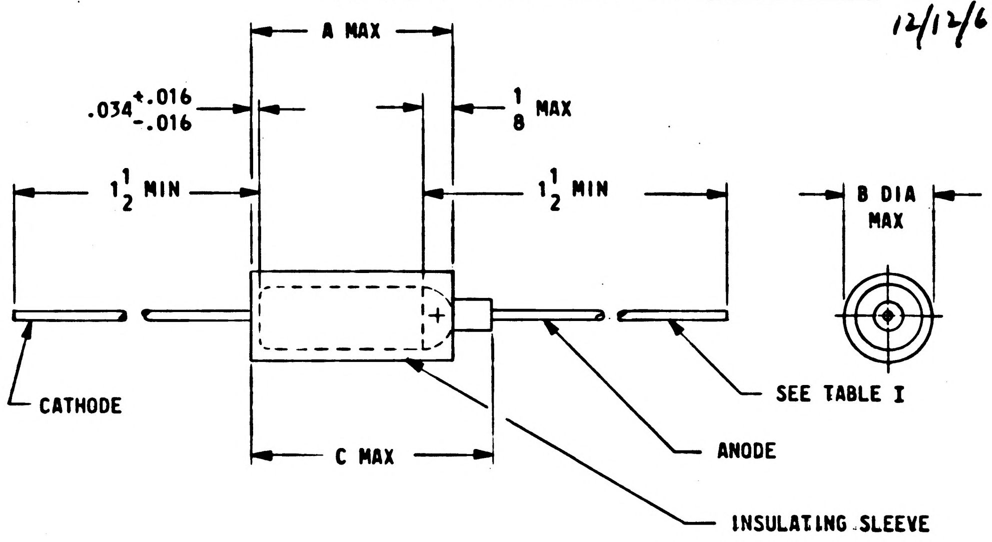

TABLE I

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	AWG	DIA	A MAX	B MAX	C MAX
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B	24	.020	.541	.201	.691
C	22	.0253	.753	.305	.903
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NORTH ADAMS, MASSACHUSETTS
CODE IDENT NO. 56289

DATA SOURCE:

SPRAGUE SPECIFICATION
NO'S DV-102A AND DV-103
DATED APRIL 14, 1961

(D) REPLACED BY REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 29 Nov 62
CHECKED A. Maynard 4 DEC 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006755
SCALE NONE	WT	SHEET 1 OF 3

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006755 D

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
D	REPLACED BY REV E WITH CHANGES PER TDRR 01161	8 May 63	WK

DASH NO.	CAPACITANCE UF ±10%	CASE STYLE	RATED WORKING VOLTAGE DC AT 25°C	RATED VAC 1/ AT 120 CPS	SPRAGUE PART NUMBER
1	5.6	A	6	.5	250D565X9006A2
2	6.8	A	6	.5	250D685X9006A2
3	47.0	B	6	.5	250D476X9006B2
4	56.0	B	6	.5	250D566X9006B2
5	150.0	C	6	.5	250D157X9006R2
6	180.0	C	6	.5	250D187X9006R2
7	270.0	D	6	.5	250D277X9006S2
8	330.0	D	6	.5	250D337X9006S2
9	3.9	A	10	1.0	250D395X9010A2
10	4.7	A	10	1.0	250D475X9010A2
11	27.0	B	10	1.0	250D276X9010B2
12	33.0	B	10	1.0	250D336X9010B2
13	39.0	B	10	1.0	250D396X9010B2
14	100.0	C	10	1.0	250D107X9010R2
15	120.0	C	10	1.0	250D127X9010R2
16	180.0	D	10	1.0	250D187X9010S2
17	220.0	D	10	1.0	250D227X9010S2
18	2.7	A	15	1.4	250D275X9015A2
19	3.3	A	15	1.4	250D335X9015A2
20	18.0	B	15	1.4	250D186X9015B2
21	22.0	B	15	1.4	250D226X9015B2
22	56.0	C	15	1.4	250D566X9015R2
23	68.0	C	15	1.4	250D686X9015R2
24	82.0	D	15	1.4	250D826X9015S2
25	150.0	D	15	1.4	250D157X9015S2
26	1.2	A	20	2.5	250D125X9020A2
27	1.5	A	20	2.5	250D155X9020A2
28	1.8	A	20	2.5	250D185X9020A2
29	2.2	A	20	2.5	250D225X9020A2
30	8.2	B	20	2.5	250D825X9020B2
31	10.0	B	20	2.5	250D106X9020B2
32	12.0	B	20	2.5	250D126X9020B2
33	15.0	B	20	2.5	250D156X9020B2
34	33.0	C	20	2.5	250D336X9020R2
35	39.0	C	20	2.5	250D396X9020R2
36	47.0	C	20	2.5	250D476X9020R2

DASH NO.	CAPACITANCE UF ±10%	CASE STYLE	RATED WORKING VOLTAGE DC AT 25°C	RATED VAC 1/ AT 120 CPS	SPRAGUE PART NUMBER
37	56.0	D	20	2.5	250D566X9020S2
38	68.0	D	20	2.5	250D686X9020S2
39	82.0	D	20	2.5	250D826X9020S2
40	100.0	D	20	2.5	250D107X9020S2
41	.0047	A	35	3.0	250D472X9035A2
42	.0056	A	35	3.0	250D562X9035A2
43	.0068	A	35	3.0	250D682X9035A2
44	.0082	A	35	3.0	250D822X9035A2
45	.01	A	35	3.0	250D103X9035A2
46	.012	A	35	3.0	250D123X9035A2
47	.015	A	35	3.0	250D153X9035A2
48	.018	A	35	3.0	250D183X9035A2
49	.022	A	35	3.0	250D223X9035A2
50	.027	A	35	3.0	250D273X9035A2
51	.033	A	35	3.0	250D333X9035A2
52	.039	A	35	3.0	250D393X9035A2
53	.047	A	35	3.0	250D473X9035A2
54	.056	A	35	3.0	250D563X9035A2
55	.068	A	35	3.0	250D683X9035A2
56	.082	A	35	3.0	250D823X9035A2
57	0.1	A	35	3.0	250D104X9035A2
58	0.12	A	35	3.0	250D124X9035A2
59	0.15	A	35	3.0	250D154X9035A2
60	0.18	A	35	3.0	250D184X9035A2
61	0.22	A	35	3.0	250D224X9035A2
62	0.27	A	35	3.0	250D274X9035A2
63	0.33	A	35	3.0	250D334X9035A2
64	0.39	A	35	3.0	250D394X9035A2
65	0.47	A	35	3.0	250D474X9035A2
66	0.56	A	35	3.0	250D564X9035A2
67	0.68	A	35	3.0	250D684X9035A2
68	0.82	A	35	3.0	250D824X9035A2
69	1.0	A	35	3.0	250D105X9035A2
70	1.2	B	35	3.0	250D125X9035B2
71	1.5	B	35	3.0	250D155X9035B2
72	1.8	B	35	3.0	250D185X9035B2

1/ BIAS TO PREVENT VOLTAGE REVERSAL. PEAK AC INCLUDING SURGES + DC NOT TO EXCEED DC RATINGS AT 25°C.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

Ⓓ REPLACED BY REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 29 Nov 62
CHECKED Maynard 4 DEC 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006755
SCALE NONE | WT | SHEET 2 OF 3

1006755 D

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006755 D

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
D	OBSOLETE PER TDRR 01161	8 May 63	aH.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

DASH NO.	CAPACITANCE UF ±10%	CASE STYLE	RATED WORKING VOLTAGE DC AT 25°C	RATED VAC 1/ AT 120 CPS	SPRAGUE PART NUMBER
73	2.2	B	35	3.0	250D225X9035B2
74	2.7	B	35	3.0	250D275X9035B2
75	3.3	B	35	3.0	250D335X9035B2
76	3.9	B	35	3.0	250D395X9035B2
77	4.7	B	35	3.0	250D475X9035B2
78	5.6	B	35	3.0	250D565X9035B2
79	6.8	B	35	3.0	250D685X9035B2
80	8.2	C	35	3.0	250D825X9035R2
81	10.0	C	35	3.0	250D106X9035R2
82	12.0	C	35	3.0	250D126X9035R2
83	15.0	C	35	3.0	250D156X9035R2
84	18.0	C	35	3.0	250D186X9035R2
85	22.0	C	35	3.0	250D226X9035R2
86	27.0	D	35	3.0	250D276X9035S2
87	33.0	D	35	3.0	250D336X9035S2
88	39.0	D	35	3.0	250D396X9035S2
89	47.0	D	35	3.0	250D476X9035S2

1/ BIAS TO PREVENT VOLTAGE REVERSAL. PEAK AC INCLUDING SURGES + DC NOT TO EXCEED DC RATINGS AT 25°C.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 **DATE** 12/12/62

REV D OBSOLETE, THIS SHEET ONLY

MASTER

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LIST OF MATERIALS

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 29 Nov 62
CHECKED 11 Dec 62
APPROVAL E C Hall 11 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL 12/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006755

SCALE NONE | WT | SHEET 3 OF 3

INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV. D WITH CHANGES AND UPGRADED TO A RELEASE PER TDRR 01161	8 May 63	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655/1B FOR STYLE CS15 CHARACTERISTIC B, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404 CLASS 2.

(1) PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.

D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.

B. LEAD MATERIAL MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS1015400. CERTIFICATION OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

(1) LEADS SHALL WITHSTAND A 4 POUND PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.

(2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

C. MARKING:

(1) EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NO. DASH NO. AND REVISION LETTER.

D. DOCUMENTATION:

(1) ALL PARTS SHALL BE SERIALIZED. ALL TEST DATA AND X-RAY NEGATIVES SHALL BE FORWARDED WITH PARTS. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

E. ELECTRICAL REQUIREMENTS:

(1) RATED VOLTAGE PER TABLE II.

(2) CAPACITANCE VALUE PER TABLE II.

3. DESIGN REQUIREMENTS:

A. THE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-26655/1B FOR:

(1) DISSIPATION FACTOR.

(2) STABILITY AT HIGH AND LOW TEMPERATURES.

(3) OPERATING TEMPERATURE RANGE (-55°C TO +85°C AND 125°C OPERATION WITH DERATING PER MIL-C-26655/1B).

(4) SURGE VOLTAGE.

4. SPECIAL CONDITIONING BY SUPPLIER:

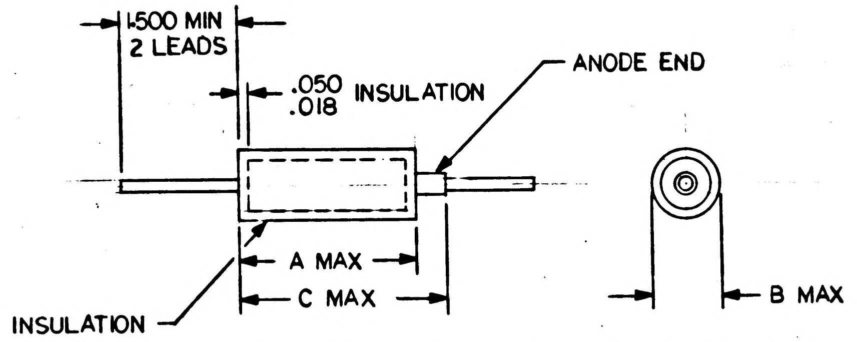
EVERY SHIPMENT SHALL BE TESTED ON A 100% BASIS, BY THE METHODS SPECIFIED TO ELIMINATE ALL SUBSTANDARD OR POTENTIALLY SUBSTANDARD UNITS.

X-RAY INSPECTION SHALL BE PER MIL-STD-202 METHOD 209, AND SHALL BE ACCOMPLISHED PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. THIS INSPECTION SHALL ELIMINATE ANY CAPACITORS HAVING LOOSE SOLDER PARTICLES OR HAVING INADEQUATE ANODE ANCHORAGE AND CONNECTION OR POOR ALIGNMENT.

BURN-IN: TO ELIMINATE ALL DEFECTIVE COMPONENTS.

EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A 1 AMP FUSE: UNITS SHALL THEN BE TESTED AT RATED VOLTAGE AT 125°C MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT, WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.

CASE SIZE	NOMINAL LEAD SIZE	DIMENSIONS		
		A	B	C
A	NO. 24 AWG	.384	.151	.422
B	(.020 DIA)	.572	.201	.610
C	NO. 22 AWG	.784	.305	.822
D	(.025 DIA)	.884	.367	.922



Ⓔ REPLACES REV D WITH CHANGES

E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Louis Mack DATE 5-4-63
CHECKED Geo J Ruez 5/7/63
APPROVAL
APPROVAL
NASA APPROVAL Jack Barman
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED ELECTROLYTIC
SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE —
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006755 | E

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	8 May 63	WK

TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C														
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.1	A
.0056													- 42	.1	A
.0068													- 43	.1	A
.0082													- 44	.1	A
.010													- 45	.1	A
.012													- 46	.1	A
.015													- 47	.1	A
.018													- 48	.1	A
.022													- 49	.1	A
.027													- 50	.1	A
.033													- 51	.1	A
.039													- 52	.1	A
.047													- 53	.1	A
.056													- 54	.1	A
.068													- 55	.1	A
.082													- 56	.1	A
.10													- 57	1	A
.12													- 58	1	A
.15													- 59	1	A
.18													- 60	1	A
.22													- 61	1	A
.27													- 62	1	A
.33													- 63	1	A
.39													- 64	1	A
.47													- 65	1	A
.56													- 66	1	A
.68													- 67	1	A
.82													- 68	1	A
1.0													- 69	1	A
1.2										- 26	1	A	- 70	1	B
1.5										- 27	1	A	- 71	1	B
1.8										- 28	1	A	- 72	1	B
2.2										- 29	1	A	- 73	1	B
2.7							- 18	1	A				- 74	1	B
3.3							- 19	1	A				- 75	1	B
3.9				- 9	1	A							- 76	1	B
4.7				- 10	1	A							- 77	1	B
5.6	- 1	1	A										- 78	1	B
6.8	- 2	1	A										- 79	2	B
8.2										- 30	1	B	- 80	3	C
10										- 31	1	B	- 81	3	C
12										- 32	1	B	- 82	3	C
15										- 33	2	B	- 83	3	C
18							- 20	3	B				- 84	3	C
22							- 21	3	B				- 85	6	C
27				- 11	2	B							- 86	6	D
33				- 12	2	B				- 34	3	C	- 87	6	D
39				- 13	2	B				- 35	3	C	- 88	6	D
47	- 3	2	B							- 36	6	C	- 89	10	D
56	- 4	2	B				- 22	6	C	- 37	6	D			
68							- 23	6	C	- 38	6	D			
82							- 24	6	D	- 39	6	D			
100				- 14	6	C				- 40	10	D			
120				- 15	6	C									
150	- 5	6	C				- 25	10	D						
180	- 6	6	C	- 16	10	D									
220				- 17	10	D									
270	- 7	6	D												
330	- 8	10	D												

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES

**S_C = CASE SIZE - SEE TABLE I

Ⓔ REPLACES REV D WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. La Cote DATE 2 Mar 63
CHECKED D. M. Sleeper 5 MAR 63
APPROVAL
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 2 OF 2

1006755 E

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006755 F

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO A RELEASE PER TDRR 01161	5 May 63	WK
F	REVISED PER TDRR 01560	12 June 63	P.K.B

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655/1B FOR STYLE CS15 CHARACTERISTIC B, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404 CLASS 2.

      (1) PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.

   D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

   A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.

   B. LEAD MATERIAL MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS1015400. CERTIFICATION OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

      (1) LEADS SHALL WITHSTAND A 4 POUND PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.

      (2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

   C. MARKING:

      (1) EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE; VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NO. DASH NO. AND REVISION LETTER.

   D. DOCUMENTATION:

      (1) ALL PARTS SHALL BE SERIALIZED. ALL TEST DATA AND X-RAY NEGATIVES SHALL BE FORWARDED WITH PARTS. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

   E. ELECTRICAL REQUIREMENTS:

      (1) RATED VOLTAGE PER TABLE II.

      (2) CAPACITANCE VALUE PER TABLE II.

3. DESIGN REQUIREMENTS:

   A. THE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-26655/1B FOR:

      (1) DISSIPATION FACTOR.

      (2) STABILITY AT HIGH AND LOW TEMPERATURES.

      (3) OPERATING TEMPERATURE RANGE (-55°C TO +85°C AND 125°C OPERATION WITH DERATING PER MIL-C-26655/1B).

      (4) SURGE VOLTAGE.

4. SPECIAL CONDITIONING BY SUPPLIER:

   A. EVERY SHIPMENT SHALL BE TESTED ON A 100% BASIS, BY THE METHODS SPECIFIED TO ELIMINATE ALL SUBSTANDARD OR POTENTIALLY SUBSTANDARD UNITS.
   X-RAY INSPECTION SHALL BE PER MIL-STD-202 METHOD 209, AND SHALL BE ACCOMPLISHED PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. THIS INSPECTION SHALL ELIMINATE ANY CAPACITORS HAVING LOOSE SOLDER PARTICLES OR HAVING INADEQUATE ANODE ANCHORAGE AND CONNECTION OR POOR ALIGNMENT.

   B. BURN-IN: TO ELIMINATE ALL DEFECTIVE COMPONENTS.

      EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A 1 AMP FUSE: UNITS SHALL THEN BE TESTED AT RATED VOLTAGE AT 125°C MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT, WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.

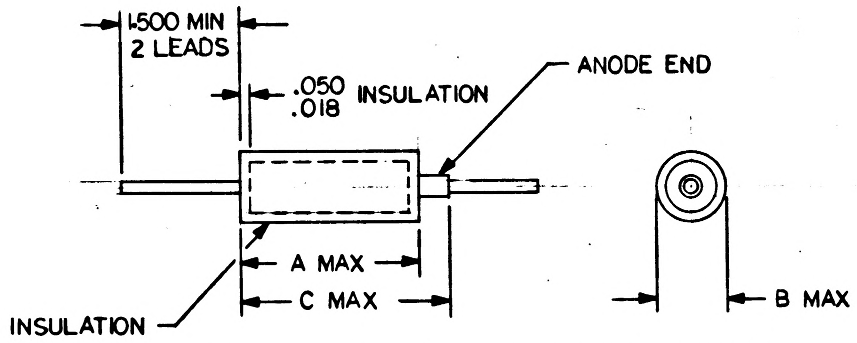
   C. EQUIVALENT SERIES RESISTANCE AT 25°C:
   UNITS SPECIFIED IN TABLE I SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left|\left[\frac{E_{C1}R_1}{E_{R1}}\right]\left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2\,E_{R1}\,E_{C1}}\right]\right|$$

WHERE

E_{C1} = AC COMPONENT ACROSS C_1 (RMS)
E_{R1} = AC COMPONENT ACROSS R_1 (RMS)
E_A = AC VOLTAGE APPLIED (RMS)
R_1 = VALUE FROM TABLE I

CASE SIZE	NOMINAL LEAD SIZE	DIMENSIONS		
		A	B	C
A	NO. 24 AWG (.020 DIA)	.384	.151	.422
B		.572	.201	.610
C	NO. 22 AWG (.025 DIA)	.784	.305	.822
D		.884	.367	.922



F	F
E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓔ REPLACES REV D WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Louis Nack DATE 5-4-63
CHECKED Geo J Russ 5/7/63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED ELECTROLYTIC
SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE —
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHA~~NGES PER TDRR 01161	8 May 63	WK
F	REVISED PER TDRR 01560	12 Jun 63	P.K.B

Ⓜ

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TABLE II

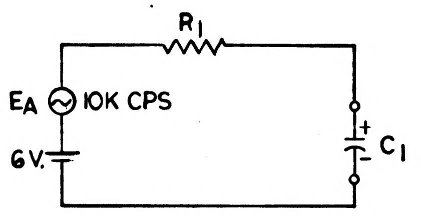
CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
.015													- 47	.6	A	- 96	0.1	A
.018													- 48	.6	A	- 97	0.1	A
.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
.033													- 51	.6	A	- 100	0.1	A
.039													- 52	.6	A	- 101	0.1	A
.047													- 53	.6	A	- 102	0.1	A
.056													- 54	.6	A	- 103	0.1	A
.068													- 55	.6	A	- 104	0.1	A
.082													- 56	.6	A	- 105	0.1	A
.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
.15													- 59	.6	A	- 108	1.0	A
.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
.39													- 64	.6	A	- 113	1.0	A
.47													- 65	.6	A	- 114	1.0	A
.56													- 66	.6	A	- 115	1.0	A
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3							- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3.	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES

** S_C = CASE SIZE - SEE TABLE I

TABLE I

C_1	R_1	E_{R1}	ESR, MAX
1006755-134	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION	

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TOLERANCES ON
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MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. La Cote AP DATE 2 Mar 63
CHECKED D.M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 2 OF 2

1006755 E

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

00165 12-12-62

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO A RELEASE PER TDRR 01161	5 May 63	WK
F	REVISED PER TDRR 01560	12 June 63	P.K.B
G	REPLACED BY REV H WITH CHANGES PER TDRR 03168	9/17/63	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655/1B FOR STYLE CS15 CHARACTERISTIC B, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404 CLASS 2.

(1) PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.

D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.

B. LEAD MATERIAL MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS1015400. CERTIFICATION OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

(1) LEADS SHALL WITHSTAND A 4 POUND PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.

(2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

C. MARKING:

(1) EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NO. DASH NO. AND REVISION LETTER.

D. DOCUMENTATION:

(1) ALL PARTS SHALL BE SERIALIZED. ALL TEST DATA AND X-RAY NEGATIVES SHALL BE FORWARDED WITH PARTS. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

E. ELECTRICAL REQUIREMENTS:

(1) RATED VOLTAGE PER TABLE II.

(2) CAPACITANCE VALUE PER TABLE II.

3. DESIGN REQUIREMENTS:

A. THE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-26655/1B FOR:

(1) DISSIPATION FACTOR.

(2) STABILITY AT HIGH AND LOW TEMPERATURES.

(3) OPERATING TEMPERATURE RANGE (-55°C TO +85°C AND 125°C OPERATION WITH DERATING PER MIL-C-26655/1B).

(4) SURGE VOLTAGE.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. EVERY SHIPMENT SHALL BE TESTED ON A 100% BASIS, BY THE METHODS SPECIFIED TO ELIMINATE ALL SUBSTANDARD OR POTENTIALLY SUBSTANDARD UNITS.
X-RAY INSPECTION SHALL BE PER MIL-STD-202 METHOD 209, AND SHALL BE ACCOMPLISHED PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. THIS INSPECTION SHALL ELIMINATE ANY CAPACITORS HAVING LOOSE SOLDER PARTICLES OR HAVING INADEQUATE ANODE ANCHORAGE AND CONNECTION OR POOR ALIGNMENT.

B. BURN-IN: TO ELIMINATE ALL DEFECTIVE COMPONENTS.

EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A 1 AMP FUSE: UNITS SHALL THEN BE TESTED AT ~~RATED~~ VOLTAGE AT 125°C MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT, WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.

C. EQUIVALENT SERIES RESISTANCE AT 25°C:
UNITS SPECIFIED IN TABLE I SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left|\left[\frac{E_{C1} R_1}{E_{R1}}\right]\left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2 E_{R1} E_{C1}}\right]\right|$$

WHERE

E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

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R_1 = VALUE FROM TABLE I

Ⓖ REPLACED BY REV H WITH CHANGES

TABLE I

CASE SIZE	NOMINAL LEAD SIZE	DIMENSIONS		
		A	B	C
A	NO. 24 AWG	.384	.151	.422
B	(.020 DIA)	.572	.201	.610
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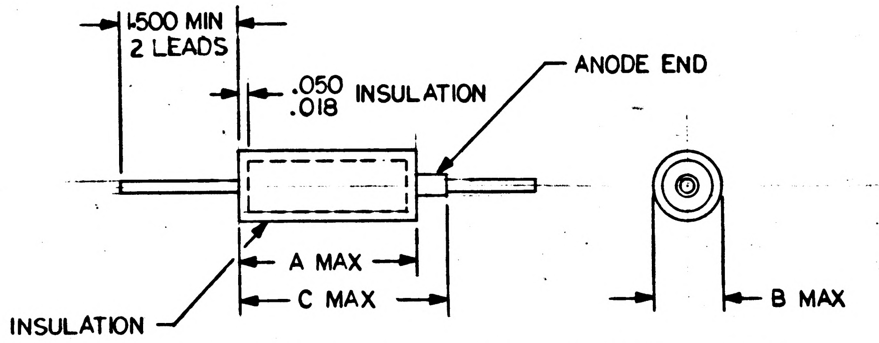

Ⓔ REPLACES REV D WITH CHANGES

G	H
F	F
E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Louis Black DATE 5-4-63
CHECKED 5/7/63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED ELECTROLYTIC
SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE —
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H	1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	

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REQUIREMENTS:

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D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.

B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

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E. ELECTRICAL REQUIREMENTS: @ 25°C
(1) CAPACITANCE VALUE PER TABLE
(2) DISSIPATION FACTOR PER TABLE
(3) LEAKAGE CURRENT PER TABLE

F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:

(1) TEMPERATURE: 85°C
(2) VOLTAGE: FULL RATED VOLTAGE
(3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE
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UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left| \left[\frac{E_{C1} R_1}{E_{R1}} \right] \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2\, E_{R1}\, E_{C1}} \right] \right|$$

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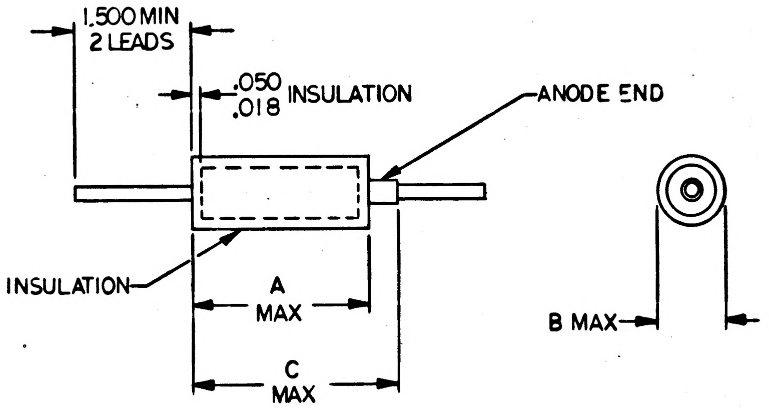

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HEAT TREATMENT ___
FINAL FINISH ___

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 16 Sept 63
CHECKED 16 Sept 63
APPROVAL
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H | 1006755

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	8 Aug 63	WK
F	REVISED PER TDRR 01560	12 June 63	P.K.B
H	REVISED PER TDRR 03168	9/17/63	

TABLE II

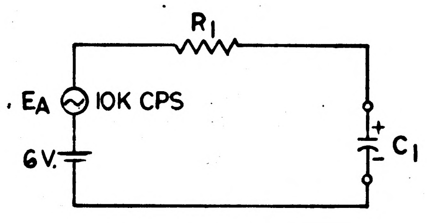
CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
.015													- 47	.6	A	- 96	0.1	A
.018													- 48	.6	A	- 97	0.1	A
.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
.033													- 51	.6	A	- 100	0.1	A
.039													- 52	.6	A	- 101	0.1	A
.047													- 53	.6	A	- 102	0.1	A
.056													- 54	.6	A	- 103	0.1	A
.068													- 55	.6	A	- 104	0.1	A
.082													- 56	.6	A	- 105	0.1	A
.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
.15													- 59	.6	A	- 108	1.0	A
.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
.39													- 64	.6	A	- 113	1.0	A
.47													- 65	.6	A	- 114	1.0	A
.56													- 66	.6	A	- 115	1.0	A
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3							- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES

** S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

Ⓔ REPLACES REV D WITH CHANGES

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FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. La Cote DATE 2 Mar 63
CHECKED D. M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Kupfer 8 Aug 63

MANNED SPACECRAFT CENTER
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CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006755
SCALE NONE | WT | SHEET 2 OF 2

INCHES
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SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK

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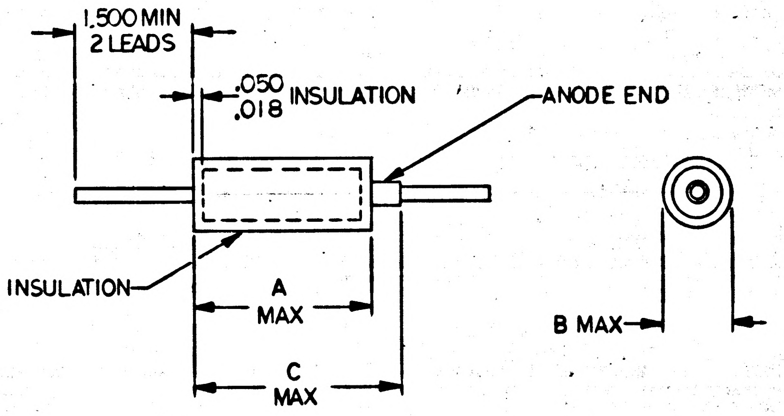

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Ⓜ	F	REVISED PER TDRR 01560	12 Jun 63	P.C.B
Ⓜ	H	REVISED PER TDRR 03168	9/17/63	
	J	REVISED PER TDRR 03705	8 Oct 63	WK

TABLE II

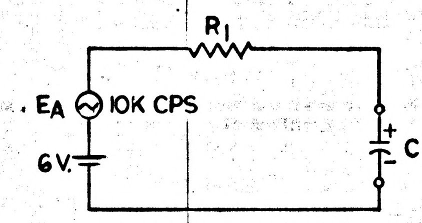
CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
.015													- 47	.6	A	- 96	0.1	A
.018													- 48	.6	A	- 97	0.1	A
.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
.033													- 51	.6	A	- 100	0.1	A
.039													- 52	.6	A	- 101	0.1	A
.047													- 53	.6	A	- 102	0.1	A
.056													- 54	.6	A	- 103	0.1	A
.068													- 55	.6	A	- 104	0.1	A
.082													- 56	.6	A	- 105	0.1	A
.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
.15													- 59	.6	A	- 108	1.0	A
.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
.39													- 64	.6	A	- 113	1.0	A
.47													- 65	.6	A	- 114	1.0	A
.56													- 66	.6	A	- 115	1.0	A
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3				-135	.1	A	- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3.	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES

** S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. La Cote DATE 28 Feb 63
CHECKED D. M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Ellen C Hall 10 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006755 K

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	BPK WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.
   - D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.
   - B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.
   - C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER. PER MIL-STD-129.
   - D. ALL PARTS SHALL BE SERIALIZED. COPIES OF ALL TEST DATA AND X-RAY NEGATIVES SHALL BE FORWARDED WITH PARTS. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.
   - E. ELECTRICAL REQUIREMENTS: @ 25°C
     - (1) CAPACITANCE VALUE PER TABLE
     - (2) DISSIPATION FACTOR 4% MAXIMUM
     - (3) LEAKAGE CURRENT PER TABLE
   - F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:
     - (1) TEMPERATURE: 85°C
     - (2) VOLTAGE: FULL RATED VOLTAGE
     - (3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE
     - (4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

     FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE: (1) THE TYPE OF INSULATION SLEEVING OR (2) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT. A CERTIFICATE OF COMPLIANCE WITH THE FAILURE RATE REQUIREMENTS DERIVED FROM THE MOST CURRENT TEST DATA OF THE PRODUCT LINE SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.
   - B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.
   - C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.
   - D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.
   - E. LEAD BEND AND PULL TEST (DESTRUCTIVE):
     - (1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.
     - (2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)
   - A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.
   - B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +125°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.

     TEST READINGS FOR EACH CAPACITOR TAKEN BEFORE AND AFTER BURN-IN FOR CAPACITANCE, DISSIPATION FACTOR AND LEAKAGE CURRENT SHALL BE SUBMITTED WITH EACH LOT.
   - C. EQUIVALENT SERIES RESISTANCE AT 25°C:

     UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left| \left[\frac{E_{C1} R_1}{E_{R1}} \right] \left[\frac{E_{R1}{}^2 + E_{C1}{}^2 - E_A{}^2}{2\, E_{R1}\, E_{C1}} \right] \right|$$

WHERE

E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

E_{R1} = AC COMPONENT ACROSS R_1 (RMS)

E_A = AC VOLTAGE APPLIED (RMS)

R_1 = VALUE FROM TABLE I

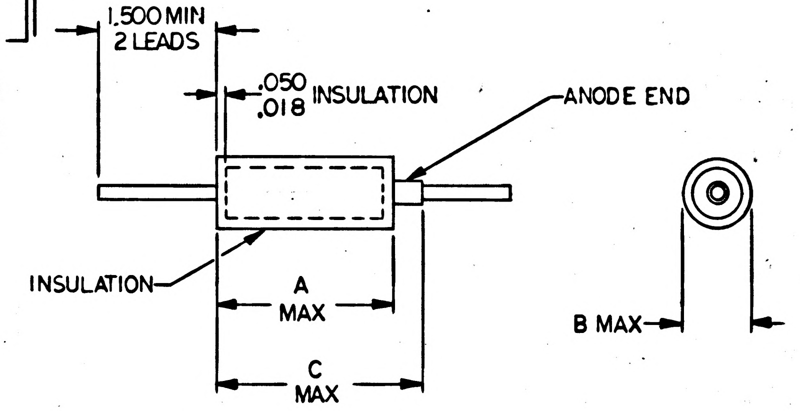


TABLE I

CASE SIZE	NOMINAL LEAD SIZE	DIMENSIONS A	B	C
A	NO. 24 AWG	.384	.151	.422
B	(.020 DIA)	.572	.201	.610
C	NO. 22 AWG	.784	.305	.822
D	(.025 DIA)	.884	.367	.922

K	K
J	J
H	H
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓗ REPLACES REV G WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 Sept 63
CHECKED 16 Sept 63
APPROVAL
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006755	K

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	8 May 63	WK
F	REVISED PER TDRR 01560	12 Jun 63	P.K.B
H	REVISED PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	WK

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TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
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.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
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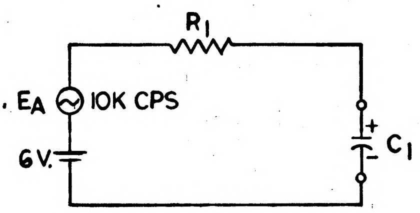
.047													- 53	.6	A	- 102	0.1	A
.056													- 54	.6	A	- 103	0.1	A
.068													- 55	.6	A	- 104	0.1	A
.082													- 56	.6	A	- 105	0.1	A
.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
.15													- 59	.6	A	- 108	1.0	A
.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
.39													- 64	.6	A	- 113	1.0	A
.47													- 65	.6	A	- 114	1.0	A
.56													- 66	.6	A	- 115	1.0	A
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3				-135	.6	A	- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES

**S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. La Corte DATE 2 Mar 63
CHECKED D.M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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L	1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/7/64	BOK WK
L	REVISED PER TDRR 13664	4 Nov 64	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.

D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING,

B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400. A CERTIFICATE OF COMPLIANCE SHALL ACCOMPANY EACH SHIPMENT.

C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER. PER MIL-STD-129.

D. ALL PARTS SHALL BE SERIALIZED. COPIES OF ALL TEST DATA AND X-RAY NEGATIVES SHALL BE FORWARDED WITH PARTS. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

E. ELECTRICAL REQUIREMENTS: @ 25°C

(1) CAPACITANCE VALUE PER TABLE

(2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS.
4% MAXIMUM FOR ALL OTHER VOLTAGE RATINGS.

F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:

(1) TEMPERATURE: 85°C

(2) VOLTAGE: FULL RATED VOLTAGE

(3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE

(4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE:

(1) THE TYPE OF INSULATION SLEEVING OR (2) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT. A CERTIFICATE OF COMPLIANCE WITH THE FAILURE RATE REQUIREMENTS DERIVED FROM THE MOST CURRENT TEST DATA OF THE PRODUCT LINE SHALL ACCOMPANY EACH SHIPMENT.

3. DESIGN REQUIREMENTS:

A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.

B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.

C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.

D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.

E. LEAD BEND AND PULL TEST (DESTRUCTIVE):

(1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.

(2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)

A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.

B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +125°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.
TEST READINGS FOR EACH CAPACITOR TAKEN BEFORE AND AFTER BURN-IN FOR CAPACITANCE, DISSIPATION FACTOR AND LEAKAGE CURRENT SHALL BE SUBMITTED WITH EACH LOT.

C. EQUIVALENT SERIES RESISTANCE AT 25°C:
UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left| \left[\frac{E_{C1} R_1}{E_{R1}} \right] \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2 E_{R1} E_{C1}} \right] \right|$$

WHERE

E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

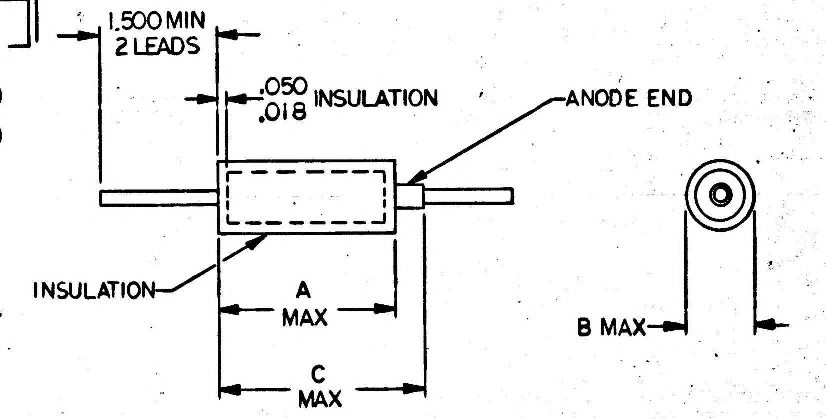
E_{R1} = AC COMPONENT ACROSS R_1 (RMS)

E_A = AC VOLTAGE APPLIED (RMS)

R_1 = VALUE FROM TABLE I

TABLE I

CASE SIZE	NOMINAL LEAD SIZE	DIMENSIONS		
		A	B	C
A	NO. 24 AWG	.384	.151	.422
B	(.020 DIA)	.572	.201	.610
C	NO. 22 AWG	.784	.305	.822
D	(.025 DIA)	.884	.367	.922



Ⓗ REPLACES REV G WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 Sept 63
CHECKED 16 Sept 63
APPROVAL
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL R Nagel 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006755 | L

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	8 May 63	WK
Ⓜ F	REVISED PER TDRR 01560	12 Jun 63	P.K.B
Ⓜ H	REVISED PER TDRR 03168	9/17/63	
Ⓜ J	REVISED PER TDRR 03705	8 Oct 63	WK
Ⓜ K	REVISED PER TDRR 06011	2/4/64	RPK WK
L	REVISED PER TDRR 13664		WK

TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
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.015													- 47	.6	A	- 96	0.1	A
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.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
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.47													- 65	.6	A	- 114	1.0	A
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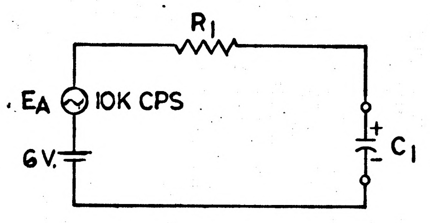
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3				-135	.6	A	- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3.	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES

** S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. La Costa DATE 8 Mar 63
CHECKED D. M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — | SIZE C | NASA DRAWING NO. 1006755
SCALE NONE | WT | SHEET 2 OF 2

1006755

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006755 M

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	BPK WK
L	REVISED PER TDRR 13664	4 Nov 64	WK
M	REVISED PER TDRR 16050	2/9/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.

D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.

B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400.

C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.

D. ALL PARTS SHALL BE SERIALIZED. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

E. ELECTRICAL REQUIREMENTS: @ 25°C
- (1) CAPACITANCE VALUE PER TABLE
- (2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS. 4% MAX. FOR ALL OTHER VOLTAGE RATINGS.
- (3) LEAKAGE CURRENT: PER TABLE II

F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:
- (1) TEMPERATURE: 85°C
- (2) VOLTAGE: FULL RATED VOLTAGE
- (3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE
- (4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE: (a) THE TYPE OF INSULATION SLEEVING OR (b) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT.

3. DESIGN REQUIREMENTS:

A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.

B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.

C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.

D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.

E. LEAD BEND AND PULL TEST (DESTRUCTIVE):
- (1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.
- (2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)

A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.

B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +125°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.

C. EQUIVALENT SERIES RESISTANCE AT 25°C:

UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left\| \left[\frac{E_{C1} R_1}{E_{R1}}\right] \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2 E_{R1} E_{C1}}\right] \right\|$$

WHERE

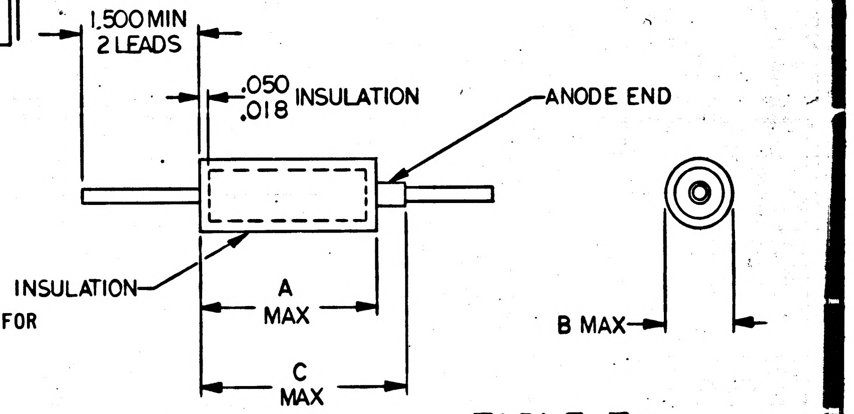
E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

E_{R1} = AC COMPONENT ACROSS R_1 (RMS)

E_A = AC VOLTAGE APPLIED (RMS)

R_1 = VALUE FROM TABLE I

5. VENDOR SUPPLIED DOCUMENTATION:
- A. CERTIFICATE OF COMPLIANCE WITH PS1015400.
- B. BEFORE-AND-AFTER BURN-IN READINGS FOR
  - (1) CAPACITANCE
  - (2) DISSIPATION FACTOR
  - (3) LEAKAGE CURRENT
- C. X-RAY NEGATIVES OF SHIPPED PARTS.
- D. TEST DATA TO SUBSTANTIATE REQUIRED FAILURE RATE.
- E. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION
  - (1) PURCHASE ORDER NUMBER
  - (2) NASA PART NUMBER
  - (3) QUANTITY AND DATE OF SHIPMENT
  - (4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR PURCHASE ORDER



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CASE SIZE	NOMINAL LEAD SIZE	DIMENSIONS A	DIMENSIONS B	DIMENSIONS C
A	NO. 24 AWG.	.384	.151	.422
B	(.020 DIA)	.572	.201	.610
C	NO. 22 AWG	.784	.305	.822
D	(.025 DIA)	.884	.367	[illegible]

Ⓗ REPLACES REV G WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIN NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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HEAT TREATMENT
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC
SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 1 OF 2

MASTE

1006755 M

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REVISIONS

	SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ	E	REPLACES REV D WITH CHANGES PER TDRR 01161	8 May 63	WK
Ⓜ	F	REVISED PER TDRR 01560	12 Jan 63	R.K.B
Ⓜ	H	REVISED PER TDRR 03168	9/17/63	[illegible]
Ⓜ	J	REVISED PER TDRR 03705	8 Oct 63	WK
Ⓜ	K	REVISED PER TDRR 06011	2/4/64	RPK WK
Ⓜ	L	REVISED PER TDRR 13664	4 Nov 64	WK
	M	REVISED PER TDRR 16050	2/9/65	WK

TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
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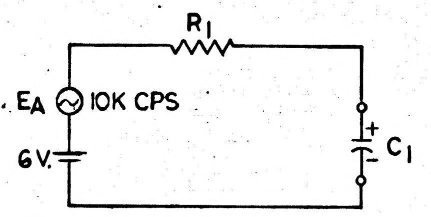
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3				-135	.6	A	- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3.	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES

**S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

Ⓔ REPLACES REV. D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. La Coste DATE 2 Mar 63
CHECKED D.M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63

NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	DH
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	EPK WK
L	REVISED PER TDRR 13664	4 Nov 64	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	6/1/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.

D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.

B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400.

C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER. PER MIL-STD-129.

D. ALL PARTS SHALL BE SERIALIZED.

PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

E. ELECTRICAL REQUIREMENTS: @ 25°C

(1) CAPACITANCE VALUE PER TABLE

(2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS. 4% MAX. FOR ALL OTHER VOLTAGE RATINGS.

(3) LEAKAGE CURRENT: PER TABLE II

F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:

(1) TEMPERATURE: 85°C

(2) VOLTAGE: FULL RATED VOLTAGE

(3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE

(4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE:

(a) THE TYPE OF INSULATION SLEEVING OR (b) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT.

3. DESIGN REQUIREMENTS:

A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.

B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.

C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.

D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.

E. LEAD BEND AND PULL TEST (DESTRUCTIVE):

(1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.

(2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)

A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.

B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +125°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.

[illegible]

C. EQUIVALENT SERIES RESISTANCE AT 25°C:

UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left| \left[\frac{E_{C1} R_1}{E_{R1}}\right] \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2\, E_{R1}\, E_{C1}}\right] \right|$$

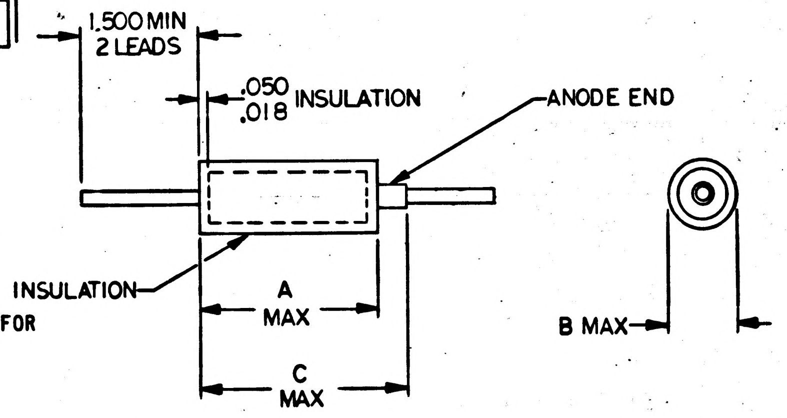
WHERE

E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

E_{R1} = AC COMPONENT ACROSS R_1 (RMS)

E_A = AC VOLTAGE APPLIED (RMS)

R_1 = VALUE FROM TABLE I



5. VENDOR SUPPLIED DOCUMENTATION:

A. CERTIFICATE OF COMPLIANCE WITH PS1015400.

B. BEFORE-AND-AFTER BURN-IN READINGS FOR
   (1) CAPACITANCE
   (2) DISSIPATION FACTOR
   (3) LEAKAGE CURRENT

C. X-RAY NEGATIVES OF SHIPPED PARTS.

D. TEST DATA TO SUBSTANTIATE REQUIRED FAILURE RATE.

E. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION
   (1) PURCHASE ORDER NUMBER
   (2) NASA PART NUMBER
   (3) QUANTITY AND DATE OF SHIPMENT
   (4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR PURCHASE ORDER

Ⓗ REPLACES REV G WITH CHANGES

MASTE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN R. Kane DATE 16 Sept. 63
CHECKED 16 Sept 63
APPROVAL
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL L Nagel 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 1 OF 2

N 1006755

SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	8 May 63	WK
F	REVISED PER TDRR 01560	12 Jan 63	P.K.B
H	REVISED PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	RPR WK
L	REVISED PER TDRR 13664	4 Nov 64	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	4/1/65	WK

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NOTE: DASH NUMBERS SHOWN ARE FOR CAPACITORS WITH INSULATED CASES (PLASTIC OVERSLEEVING). FOR UNINSULATED EQUIVALENTS, ADD 200 TO THE DASH NO.
E.G. 5.6 uf, 6V DC INSULATED CASE = -1
5.6 uf, yV DC UNINSULATED CASE = -201

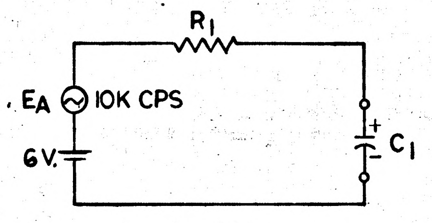
TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
.015													- 47	.6	A	- 96	0.1	A
.018													- 48	.6	A	- 97	0.1	A
.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
.033													- 51	.6	A	- 100	0.1	A
.039													- 52	.6	A	- 101	0.1	A
.047													- 53	.6	A	- 102	0.1	A
.056													- 54	.6	A	- 103	0.1	A
.068													- 55	.6	A	- 104	0.1	A
.082													- 56	.6	A	- 105	0.1	A
.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
.15													- 59	.6	A	- 108	1.0	A
.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
.39													- 64	.6	A	- 113	1.0	A
.47													- 65	.6	A	- 114	1.0	A
.56													- 66	.6	A	- 115	1.0	A
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3				-135	.6	A	- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3.	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES
** S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134 & -334	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128 & -328	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118 & -318	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

CASE SIZE	NOMINAL LEAD SIZE	INSULATED CASE DIMENSIONS			UNINSULATED CASE DIMENSIONS		
		A	B	C	A	B	C
A	NO. 24 AWG	.384	.151	.422	.281	.130	.372
B	.020 DIA	.572	.201	.610	.469	.180	.560
C	NO. 22 AWG	.784	.305	.822	.681	.284	.772
D	.025 DIA	.884	.367	.922	.781	.346	.872

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. La Cote DATE 2 Mar 63
CHECKED D.M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 2 OF 2

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P	1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	BPK WK
L	REVISED PER TDRR 13664	4 Nov 64	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	4/1/65	WK
P	REVISED PER TDRR 21593	8/31/65	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.
   - D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.
   - B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400.
   - C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER. PER MIL-STD-129.
   - D. ALL PARTS SHALL BE SERIALIZED.

     PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.
   - E. ELECTRICAL REQUIREMENTS: @ 25°C
     - (1) CAPACITANCE VALUE PER TABLE
     - (2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS. 4% MAX. FOR ALL OTHER VOLTAGE RATINGS.
     - (3) LEAKAGE CURRENT: PER TABLE II
   - F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:
     - (1) TEMPERATURE: 85°C
     - (2) VOLTAGE: FULL RATED VOLTAGE
     - (3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE
     - (4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

     FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE:

     (a) THE TYPE OF INSULATION SLEEVING OR (b) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT.
3. DESIGN REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.
   - B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.
   - C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.
   - D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.
   - E. LEAD BEND AND PULL TEST (DESTRUCTIVE):
     - (1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.
     - (2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.
4. SPECIAL CONDITIONING BY SUPPLIER: (100%)
   - A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.
   - B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +85°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.
   - C. EQUIVALENT SERIES RESISTANCE AT 25°C:

     UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left\| \left[\frac{E_{C1}R_1}{E_{R1}}\right] \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2\,E_{R1}\,E_{C1}}\right] \right\|$$

WHERE

E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

E_{R1} = AC COMPONENT ACROSS R_1 (RMS)

E_A = AC VOLTAGE APPLIED (RMS)

R_1 = VALUE FROM TABLE I

5. VENDOR SUPPLIED DOCUMENTATION:
   - A. CERTIFICATE OF COMPLIANCE WITH PS1015400.
   - B. BEFORE-AND-AFTER BURN-IN READINGS FOR
     - (1) CAPACITANCE
     - (2) DISSIPATION FACTOR
     - (3) LEAKAGE CURRENT
   - C. X-RAY NEGATIVES OF SHIPPED PARTS.
   - D. TEST DATA TO SUBSTANTIATE REQUIRED FAILURE RATE.
   - E. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION
     - (1) PURCHASE ORDER NUMBER
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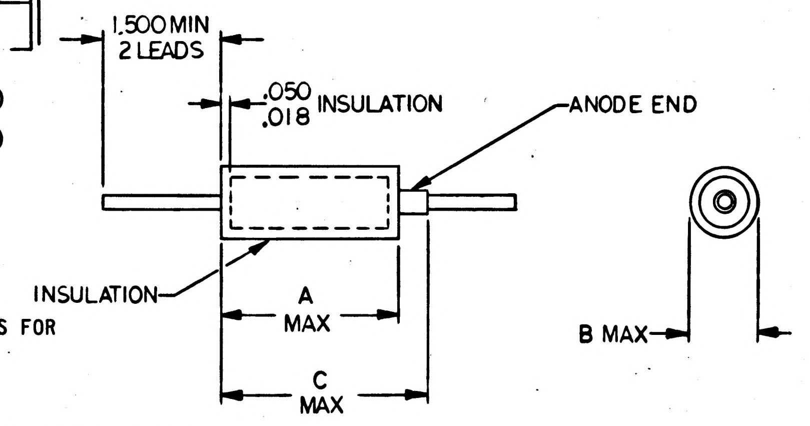

Ⓗ REPLACES REV G WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT ___

FINAL FINISH ___

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 Sept 63
CHECKED 16 Sept 63
APPROVAL ___
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
___	C	1006755

SCALE NONE | WT | SHEET 1 OF 2

1006755	P

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	[illegible] 63	WK
F	REVISED PER TDRR 01560	12 Jan 63	P.K.B
H	REVISED PER TDRR 03168	9/17/63	[illegible]
J	REVISED PER TDRR 03705	30 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	RPR WK
L	REVISED PER TDRR 13664	[illegible]	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	4/1/65	WK
P	REVISED PER TDRR 21593	8/31/65	WK

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NOTE: DASH NUMBERS SHOWN ARE FOR CAPACITORS WITH INSULATED CASES (PLASTIC OVERSLEEVING). FOR UNINSULATED EQUIVALENTS, ADD 200 TO THE DASH NO.
E.G. 5.6 uf, 6V DC INSULATED CASE = -1
5.6 uf, yV DC UNINSULATED CASE = -201

TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
.015													- 47	.6	A	- 96	0.1	A
.018													- 48	.6	A	- 97	0.1	A
.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
.033													- 51	.6	A	- 100	0.1	A
.039													- 52	.6	A	- 101	0.1	A
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.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
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.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
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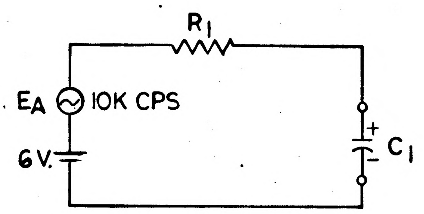
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3				-135	.6	A	- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3.	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES
**S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134 & -334	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128 & -328	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118 & -318	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

TABLE I

CASE SIZE	NOMINAL LEAD SIZE	INSULATED CASE DIMENSIONS			UNINSULATED CASE DIMENSIONS		
		A	B	C	A	B	C
A	NO. 24 AWG .020 DIA	.384	.151	.422	.281	.141	.422
B		.572	.201	.610	.469	.191	.610
C	NO. 22 AWG .025 DIA	.784	.305	.822	.681	.295	.822
D		.884	.367	.922	.781	.357	.922

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. La Corte AP DATE 2 Mar 63
CHECKED D.M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Kupfer 8 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC,
SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	[illegible]
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	WK
L	REVISED PER TDRR 13664	[illegible]	WK
M	REVISED PER TDRR 16050	2/5/65	WK
N	REVISED PER TDRR 17479	6/1/65	WK
P	REVISED PER TDRR 21593	8/31/65	WK
R	REVISED PER TDRR 23469	[illegible]/65	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.
   - D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.
   - B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400.
   - C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER. PER MIL-STD-129.
   - D. ALL PARTS SHALL BE SERIALIZED. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.
   - E. ELECTRICAL REQUIREMENTS: @ 25°C
     - (1) CAPACITANCE VALUE PER TABLE II AND IV
     - (2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS. 4% MAX. FOR ALL OTHER VOLTAGE RATINGS.
     - (3) LEAKAGE CURRENT: PER TABLE II AND IV
   - F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:
     - (1) TEMPERATURE: 85°C
     - (2) VOLTAGE: FULL RATED VOLTAGE
     - (3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE
     - (4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

     FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE:

     (a) THE TYPE OF INSULATION SLEEVING OR (b) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT.

3. DESIGN REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.
   - B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.
   - C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.
   - D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.
   - E. LEAD BEND AND PULL TEST (DESTRUCTIVE):
     - (1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.
     - (2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)
   - A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.
   - B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +85°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.
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WHERE

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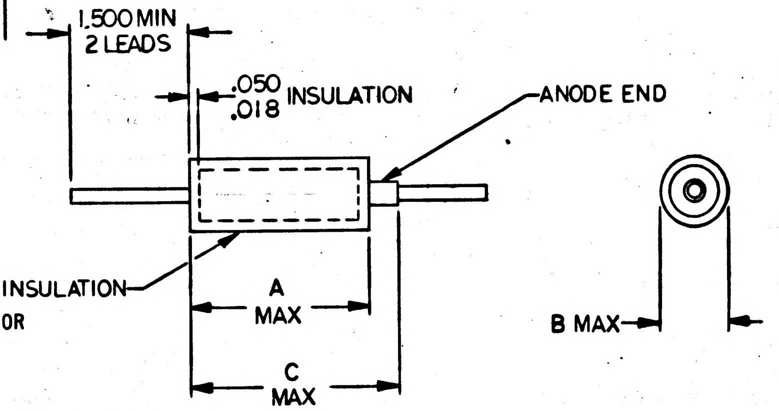

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MASTE

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LIST OF MATERIALS

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HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 16 Sept 63
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APPROVAL
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL
MIT APPROVAL [illegible] 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 1 OF 2

1006755 R

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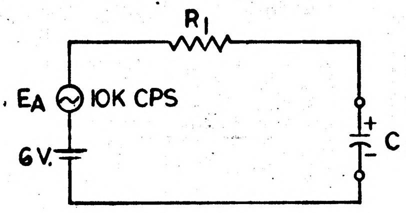
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES
** S_C = CASE SIZE - SEE TABLE I

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	~~REPLACES REV D WITH CHANGES~~ PER TDRR 01161	8/15/63	WK
F	REVISED PER TDRR 01560	12 Jan 63	P.R.B
H	REVISED PER TDRR 03168	9/17/63	[illegible]
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	RPR WK
L	REVISED PER TDRR 13664	[illegible]	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	4/1/65	WK
P	REVISED PER TDRR 21593	8/31/65	WK
R	REVISED PER TDRR 23469	11/2/65	WK

TABLE III			
C_1	R_1	E_{R1}	ESR, MAX
1006755-134 & -334	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128 & -328	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118 & -318	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

TABLE I							
CASE SIZE	NOMINAL LEAD SIZE	INSULATED CASE DIMENSIONS			UNINSULATED CASE DIMENSIONS		
		A	B	C	A	B	C
A	NO. 24 AWG	.384	.151	.422	.281	.141	.422
B	.020 DIA	.572	.201	.610	.469	.191	.610
C	NO. 22 AWG	.784	.305	.822	.681	.295	.822
D	.025 DIA	.884	.367	.922	.781	.357	.922

TABLE IV

CAPACITOR VALUE UF ± 10%	RATED CONTINUOUS DC VOLTAGE AT 25°C		
	20 VDC		
	DASH NO.	I_L AT 75°C	S_C
33	135	1UA MAX	C

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. La Cote AP DATE 28 Feb 63
CHECKED D.M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

S 1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	WK
L	REVISED PER TDRR 13664	4 Nov 64	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	[illegible]/1/65	WK
P	REVISED PER TDRR 21593	8/31/65	WK
R	REVISED PER TDRR 23469	[illegible]/2/65	WK
S	REVISED PER TDRR 25530	2/15/66	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.
   - D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.
   - B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400.
   - C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER. PER MIL-STD-129.
   - D. ALL PARTS SHALL BE SERIALIZED. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.
   - E. ELECTRICAL REQUIREMENTS: @ 25°C
     - (1) CAPACITANCE VALUE PER TABLE II AND IV
     - (2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS. 4% MAX. FOR ALL OTHER VOLTAGE RATINGS.
     - (3) LEAKAGE CURRENT: PER TABLE II AND IV
   - F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:
     - (1) TEMPERATURE: 85°C
     - (2) VOLTAGE: FULL RATED VOLTAGE
     - (3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE
     - (4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

     FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE:

     (a) THE TYPE OF INSULATION SLEEVING OR (b) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT.

3. DESIGN REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.
   - B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.
   - C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.
   - D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.
   - E. LEAD BEND AND PULL TEST (DESTRUCTIVE):
     - (1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.
     - (2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)
   - A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.
   - B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +85°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.
   - C. EQUIVALENT SERIES RESISTANCE AT 25°C:

     UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left| \left[\frac{E_{C1}R_1}{E_{R1}}\right] \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2\,E_{R1}\,E_{C1}}\right] \right|$$

WHERE

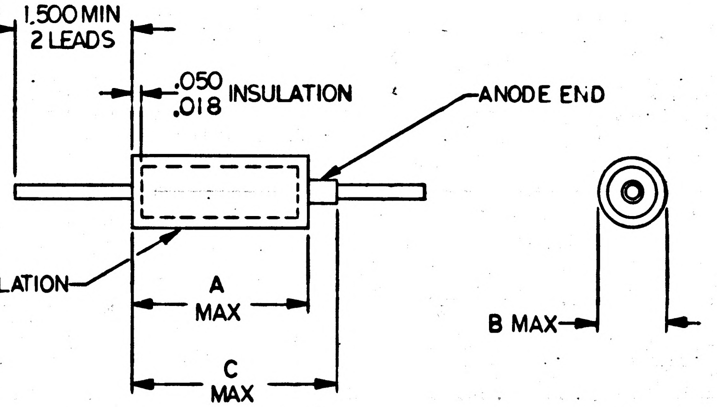
E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

E_{R1} = AC COMPONENT ACROSS R_1 (RMS)

E_A = AC VOLTAGE APPLIED (RMS)

R_1 = VALUE FROM TABLE I

5. VENDOR SUPPLIED DOCUMENTATION:
   - A. CERTIFICATE OF COMPLIANCE WITH PS1015400.
   - B. BEFORE-AND-AFTER BURN-IN READINGS FOR
     - (1) CAPACITANCE
     - (2) DISSIPATION FACTOR
     - (3) LEAKAGE CURRENT
   - C. X-RAY NEGATIVES OF SHIPPED PARTS.
   - D. TEST DATA TO SUBSTANTIATE REQUIRED FAILURE RATE.
   - E. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION
     - (1) PURCHASE ORDER NUMBER
     - (2) NASA PART NUMBER
     - (3) QUANTITY AND DATE OF SHIPMENT
     - (4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR PURCHASE ORDER



Ⓗ REPLACES REV G WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 Sept 63
CHECKED 16 Sept 63
APPROVAL
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC,
SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 1 OF 3

S	1006755

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NOTE: DASH NUMBERS SHOWN ARE FOR CAPACITORS WITH INSULATED CASES (PLASTIC OVERSLEEVING). FOR UNINSULATED EQUIVALENTS, ADD 200 TO THE DASH NO.
E.G. 5.6 uf, 6V DC INSULATED CASE = -1
5.6 uf, yV DC UNINSULATED CASE = -201

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	8 Jan 63	WK
F	REVISED PER TDRR 01560	12 Jan 63	P.K.B
H	REVISED PER TDRR 03168	9/17/63	[illegible]
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	RPK WK
L	REVISED PER TDRR 13664	4 Nov 64	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	4/1/65	WK
P	REVISED PER TDRR 21593	8/31/65	WK
R	REVISED PER TDRR 23469	11/2/65	WK
S	REVISED PER TDRR 25530	2/15/66	WK

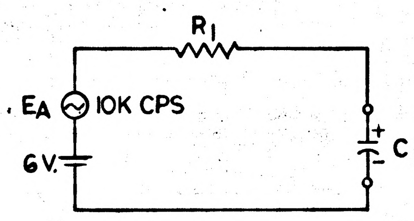
TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
.015													- 47	.6	A	- 96	0.1	A
.018													- 48	.6	A	- 97	0.1	A
.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
.033													- 51	.6	A	- 100	0.1	A
.039													- 52	.6	A	- 101	0.1	A
.047													- 53	.6	A	- 102	0.1	A
.056													- 54	.6	A	- 103	0.1	A
.068													- 55	.6	A	- 104	0.1	A
.082													- 56	.6	A	- 105	0.1	A
.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
.15													- 59	.6	A	- 108	1.0	A
.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
.39													- 64	.6	A	- 113	1.0	A
.47													- 65	.6	A	- 114	1.0	A
.56													- 66	.6	A	- 115	1.0	A
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B
1.8										- 28	.6	A	- 72	1	B	- 121	2	B
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B
3.3				-135	.6	A	- 19	.8	A				- 75	1.7	B	- 124	2	B
3.9				- 9	.6	A							- 76	2	B	- 125	2	B
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C
10										- 31	3.	B	- 81	4	C	- 130	3	C
12										- 32	3.5	B	- 82	4	C	- 131	3	C
15										- 33	4	B	- 83	6	C	- 132	6	C
18							- 20	4	B				- 84	6	C	- 133	6	C
22							- 21	5	B				- 85	7	C	- 134	6	D
27				- 11	4	B							- 86	7	D			
33				- 12	5	B				- 34	5	C	- 87	8	D			
39				- 13	5	B				- 35	6	C	- 88	10	D			
47	- 3	4	B							- 36	7	C	- 89	10	D			
56	- 4	5	B				- 22	7	C	- 37	8.5	D						
68							- 23	9	C	- 38	10	D						
82							- 24	9	D	- 39	12	D						
100				- 14	10	C				- 40	15	D						
120				- 15	12	C												
150	- 5	9	C				- 25	15	D									
180	- 6	11	C	- 16	18	D												
220				- 17	20	D												
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES
**S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134 & -334	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128 & -328	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118 & -318	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

TABLE I

CASE SIZE	NOMINAL LEAD SIZE	INSULATED CASE DIMENSIONS			UNINSULATED CASE DIMENSIONS		
		A	B	C	A	B	C
A	NO. 24 AWG	.384	.151	.422	.281	.141	.422
B	.020 DIA	.572	.201	.610	.469	.191	.610
C	NO. 22 AWG	.784	.305	.822	.681	.295	.822
D	.025 DIA	.884	.367	.922	.781	.357	.922

TABLE IV

CAPACITOR VALUE UF ± 10%	RATED CONTINUOUS DC VOLTAGE AT 25°C		
	20 VDC		
	DASH NO.	I_L AT 75°C	S_C
33	135	1UA MAX	C

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. La Certe AP DATE 28 Feb 63
CHECKED D.M. Sloper 5 MAR 63
APPROVAL
APPROVAL Ellen C Hall 10 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Kupfer 8 Jul 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 2 OF 3

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
S		THIS SHEET ADDED PER TDRR 25530	WFH		2/15/66	WR

TABLE 11 CON'D.

75 VDC			
CAP VALUE uF ± 10%	DASH NO.	I_L	S_C
.0047	-136	.6	A
.0056	-137	↑	↑
.0068	-138		
.0082	-139		
.010	-140		
.012	-141		
.015	-142		
.018	-143		
.022	-144		
.027	-145		
.033	-146		
.039	-147		
.047	-148		
.056	-149		
.068	-150		
.082	-151		
.10	-152		
.12	-153		
.15	-154		
.18	-155		
.22	-156		
.27	-157		
.33	-158		
.39	-159		
.47	-160		↓
.56	-161	↓	
.68	-162	.6	A
.82	-163	.7	B
1.0	-164	.8	↑
1.2	-165	.9	
1.5	-166	1.1	
1.8	-167	1.4	
2.2	-168	1.7	
2.7	-169	2.0	↓
3.3	-170	2.5	B
3.9	-171	3.0	B
4.7	-172	4.0	C
5.6	-173	4.0	↑
6.8	-174	6.0	
8.2	-175	6.0	↓
10.0	-176	8.0	C
12.0	-177	10.0	D
15.0	-178	12.0	D

Ⓢ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN R. KINGSBURY 2-14-66
CHECKED A Marto 2-15-66
APPROVED
APPROVED A Alonso FOR E.C. HALL 2/15/66
APPROVED MIT A. C. METZGER 2/15/66
APPROVED MSC
DATE

CAPACITOR FIXED, ELECTROLYTIC SOLID TANTALUM SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006755
SCALE NONE
SHEET 3 OF 3

1006755 S

T	1006755

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.

D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.

B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400.

C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER. PER MIL-STD-129.

D. ALL PARTS SHALL BE SERIALIZED.

PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

E. ELECTRICAL REQUIREMENTS: @ 25°C

(1) CAPACITANCE VALUE PER TABLE II AND IV

(2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS, 4% MAX. FOR ALL OTHER VOLTAGE RATINGS.

(3) LEAKAGE CURRENT: PER TABLE II AND IV

F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:

(1) TEMPERATURE: 85°C

(2) VOLTAGE: FULL RATED VOLTAGE

(3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE

(4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE:

(a) THE TYPE OF INSULATION SLEEVING OR (b) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT.

3. DESIGN REQUIREMENTS:

A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.

B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.

C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.

D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.

E. LEAD BEND AND PULL TEST (DESTRUCTIVE):

(1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.

(2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)

A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.

B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +85°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.

C. EQUIVALENT SERIES RESISTANCE AT 25°C:

UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \left| \left[\frac{E_{C1} R_1}{E_{R1}} \right] \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2 E_{R1} E_{C1}} \right] \right|$$

WHERE

E_{C1} = AC COMPONENT ACROSS C_1 (RMS)

E_{R1} = AC COMPONENT ACROSS R_1 (RMS)

E_A = AC VOLTAGE APPLIED (RMS)

R_1 = VALUE FROM TABLE I

5. VENDOR SUPPLIED DOCUMENTATION:

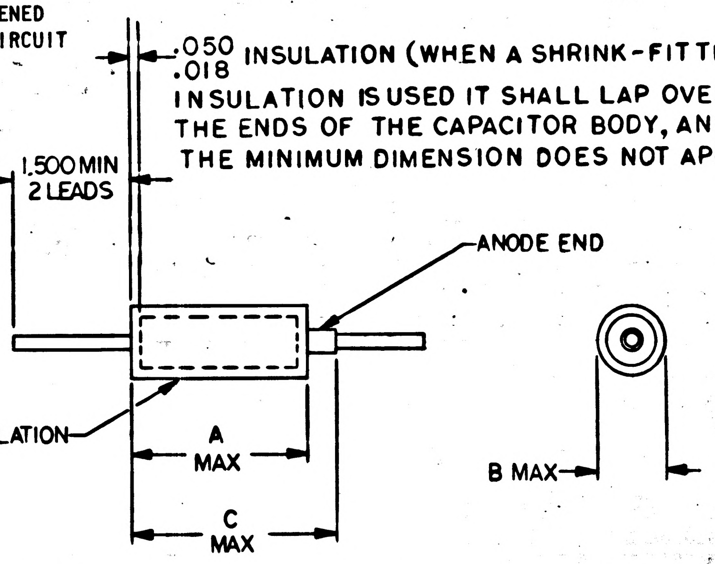
A. CERTIFICATE OF COMPLIANCE WITH PS1015400.

B. BEFORE-AND-AFTER BURN-IN READINGS FOR
   (1) CAPACITANCE
   (2) DISSIPATION FACTOR
   (3) LEAKAGE CURRENT

C. X-RAY NEGATIVES OF SHIPPED PARTS.

D. TEST DATA TO SUBSTANTIATE REQUIRED FAILURE RATE.

E. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION
   (1) PURCHASE ORDER NUMBER
   (2) NASA PART NUMBER
   (3) QUANTITY AND DATE OF SHIPMENT
   (4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR PURCHASE ORDER



.050/.018 INSULATION (WHEN A SHRINK-FITTED INSULATION IS USED IT SHALL LAP OVER THE ENDS OF THE CAPACITOR BODY, AND THE MINIMUM DIMENSION DOES NOT APPLY)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	WK
L	REVISED PER TDRR 13664		WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	4/1/65	WK
P	REVISED PER TDRR 21593	8/31/65	WK
R	REVISED PER TDRR 23469	/65	WK
S	REVISED PER TDRR 25530	2/15/66	WK
T	REVISED PER TDRR 28435	5-17-66	

Ⓗ REPLACES REV G WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 16 Sept 63
CHECKED 16 Sept 63
APPROVAL
APPROVAL Eldon C Hall 17 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR FIXED, ELECTROLYTIC, SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 SIZE C NASA DRAWING NO. 1006755
SCALE NONE WT SHEET 1 OF 3

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NOTE: DASH NUMBERS SHOWN ARE FOR CAPACITORS WITH INSULATED CASES (PLASTIC OVERSLEEVING). FOR UNINSULATED EQUIVALENTS, ADD 200 TO THE DASH NO.
E.G. 5.6 uf, 6V DC INSULATED CASE = -1
5.6 uf, yV DC UNINSULATED CASE = -201

T | 1006755

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES ~~REV D WITH CHANGES~~ PER TDRR 01161	8 Jan 63	WK
F	REVISED PER TDRR 01560	12 Jan 63	P.K.B
H	REVISED PER TDRR 03168	9/17/63	
J	REVISED PER TDRR 03705	8 Oct 63	WK
K	REVISED PER TDRR 06011	2/4/64	EPR WK
L	REVISED PER TDRR 13664	4 Nov 64	WK
M	REVISED PER TDRR 16050	2/9/65	WK
N	REVISED PER TDRR 17479	4/1/65	WK
P	REVISED PER TDRR 21593	8/3/65	WK
R	REVISED PER TDRR 23469	11/2/65	WK
S	REVISED PER TDRR 25530	2/15/66	WK
T	REVISED PER TDRR 28435	5-17-66	WKM

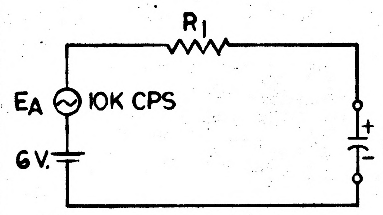
TABLE II

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																				
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC			50 VDC		
	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **	DASH NO.	I_L *	S_C **
.0047													- 41	.6	A	- 90	0.1	A			
.0056													- 42	.6	A	- 91	0.1	A			
.0068													- 43	.6	A	- 92	0.1	A			
.0082													- 44	.6	A	- 93	0.1	A			
.010													- 45	.6	A	- 94	0.1	A			
.012													- 46	.6	A	- 95	0.1	A			
.015													- 47	.6	A	- 96	0.1	A			
.018													- 48	.6	A	- 97	0.1	A			
.022													- 49	.6	A	- 98	0.1	A			
.027													- 50	.6	A	- 99	0.1	A			
.033													- 51	.6	A	- 100	0.1	A			
.039													- 52	.6	A	- 101	0.1	A			
.047													- 53	.6	A	- 102	0.1	A			
.056													- 54	.6	A	- 103	0.1	A			
.068													- 55	.6	A	- 104	0.1	A			
.082													- 56	.6	A	- 105	0.1	A			
.10													- 57	.6	A	- 106	1.0	A			
.12													- 58	.6	A	- 107	1.0	A			
.15													- 59	.6	A	- 108	1.0	A			
.18													- 60	.6	A	- 109	1.0	A			
.22													- 61	.6	A	- 110	1.0	A			
.27													- 62	.6	A	- 111	1.0	A			
.33													- 63	.6	A	- 112	1.0	A			
.39													- 64	.6	A	- 113	1.0	A			
.47													- 65	.6	A	- 114	1.0	A			
.56													- 66	.6	A	- 115	1.0	A			
.68													- 67	.6	A	- 116	2	A			
.82													- 68	.6	A	- 117	2	A			
1.0													- 69	.6	A	- 118	2	A	-180	2	A
1.2										- 26	.6	A	- 70	.6	B	- 119	2	B			
1.5										- 27	.6	A	- 71	.8	B	- 120	2	B			
1.8										- 28	.6	A	- 72	1	B	- 121	2	B			
2.2										- 29	.7	A	- 73	1.2	B	- 122	2	B			
2.7							- 18	.6	A				- 74	1.4	B	- 123	2	B			
3.3				-135	.6	A	- 19	.8	A				- 75	1.7	B	- 124	2	B			
3.9				- 9	.6	A							- 76	2	B	- 125	2	B			
4.7				- 10	.7	A							- 77	2.5	B	- 126	3	B			
5.6	- 1	.6	A										- 78	3	B	- 127	3	C			
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C	-181	3	C
8.2										- 30	2.5	B	- 80	3.5	C	- 129	3	C			
10										- 31	3.	B	- 81	4	C	- 130	3	C			
12										- 32	3.5	B	- 82	4	C	- 131	3	C			
15										- 33	4	B	- 83	6	C	- 132	6	C			
18							- 20	4	B				- 84	6	C	- 133	6	C			
22							- 21	5	B				- 85	7	C	- 134	6	D	-182	6	D
27				- 11	4	B							- 86	7	D						
33				- 12	5	B				- 34	5	C	- 87	8	D						
39				- 13	5	B				- 35	6	C	- 88	10	D						
47	- 3	4	B							- 36	7	C	- 89	10	D						
56	- 4	5	B				- 22	7	C	- 37	8.5	D									
68							- 23	9	C	- 38	10	D									
82							- 24	9	D	- 39	12	D									
100				- 14	10	C				- 40	15	D									
120				- 15	12	C															
150	- 5	9	C				- 25	15	D												
180	- 6	11	C	- 16	18	D															
220				- 17	20	D															
270	- 7	16	D																		
330	- 8	20	D																		

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES
** S_C = CASE SIZE - SEE TABLE I

TABLE III

C_1	R_1	E_{R1}	ESR, MAX
1006755-134 & -334	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128 & -328	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118 & -318	15Ω ± 1%	1.5 VRMS	5.0Ω



TEST CIRCUIT

TABLE I

CASE SIZE	NOMINAL LEAD SIZE	INSULATED CASE DIMENSIONS			UNINSULATED CASE DIMENSIONS		
		A	B	C	A	B	C
A	NO. 24 AWG .020 DIA	.384	.151	.422	.281	.141	.422
B		.572	.201	.610	.469	.191	.610
C	NO. 22 AWG .025 DIA	.784	.305	.822	.681	.295	.822
D		.884	.367	.922	.781	.357	.922

TABLE IV

CAPACITOR VALUE UF ± 10%	RATED CONTINUOUS DC VOLTAGE AT 25°C		
	20 VDC		
	DASH NO.	I_L AT 75°C	S_C
33	179	1UA MAX	C

Ⓔ REPLACES REV D WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. La Coste AP DATE 8 Mar 63
CHECKED D. M. Sleeper 5 MAR 63
APPROVAL
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 8 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230 | SIZE C | NASA DRAWING NO. 1006755
SCALE NONE | WT | SHEET 2 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
S		THIS SHEET ADDED PER TDRR 25530	WFH	-	2/15/66	WR
T		REVISED PER TDRR 28435	WFH		5/7/66	

TABLE II CON'D.

75 VDC

CAP VALUE uF ± 10%	DASH NO.	I_L	S_C
.0047	-136	.6	A
.0056	-137	↑	↑
.0068	-138	│	│
.0082	-139	│	│
.010	-140	│	│
.012	-141	│	│
.015	-142	│	│
.018	-143	│	│
.022	-144	│	│
.027	-145	│	│
.033	-146	│	│
.039	-147	│	│
.047	-148	│	│
.056	-149	│	│
.068	-150	│	│
.082	-151	│	│
.10	-152	│	│
.12	-153	│	│
.15	-154	│	│
.18	-155	│	│
.22	-156	│	│
.27	-157	│	│
.33	-158	│	│
.39	-159	│	│
.47	-160	│	↓
.56	-161	↓	
.68	-162	.6	A
.82	-163	.7	B
1.0	-164	.8	↑
1.2	-165	.9	│
1.5	-166	1.1	│
1.8	-167	1.4	│
2.2	-168	1.7	↓
2.7	-169	2.0	
3.3	-170	2.5	B
3.9	-171	3.0	B
4.7	-172	4.0	C
5.6	-173	4.0	↑
6.8	-174	6.0	│
8.2	-175	6.0	↓
10.0	-176	8.0	C
12.0	-177	10.0	D
15.0	-178	12.0	D

Ⓢ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± —— ± —— ± ——
DO NOT SCALE THIS DRAWING

MATERIAL ——

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	R. KINGSBURY	2-14-66
CHECKED	A Martz	2-15-66
APPROVED		
APPROVED	FOR E.C. HALL	2/15/66
APPROVED MIT	A. C. METZGER	15 Feb 66
APPROVED MSC		DATE

CAPACITOR FIXED, ELECTROLYTIC
SOLID TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006755

SCALE NONE
SHEET 3 OF 3

MASTER

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1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM BUWEPS DWG. 2318867		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SPRAGUE TYPE 250 D PER DATA SOURCE NOTED EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ELECTRICAL RATINGS: PER TABLE II ON SHEET 2.
   - C. CAPACITANCE AT 120 CPS • 25°C: PER SHEET 2.
     CAPACITANCE TOLERANCE: ± 10% • 120 CPS • 25°C.
   - D. MAXIMUM DISSIPATION FACTOR
     - AT -80°C: 0.08
     - AT +25°C: 0.06
     - AT +85°C: 0.08
     - AT +125°C: 0.09
   - E. OPERATING TEMPERATURE RANGE: -80°C TO +85°C.
   - F. MAX D.C. LEAKAGE CURRENT: .05 UA/UF - VOLT, BUT IN NO CASE NEED THE LEAKAGE CURRENT BE LESS THAN 1 UA.
2. CONSTRUCTION REQUIREMENTS:
   - A. INSULATING SLEEVE: MYLAR, CAPABLE OF WITHSTANDING 2000 VDC FOR 1 MIN ± 5 SEC.
   - B. LEADS: UNITS SHALL HAVE WELDABLE NICKEL LEADS PER ND 1015400.

     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS, UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - C. DIMENSIONS AND TOLERANCES: PER TABLE I ON SHEET 1 AND SKETCH.
   - D. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, VOLTAGE AND CAPACITANCE RATING AND POLARITY.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA NUMBER, DASH NUMBER AND REVISION LETTER.
3. ENVIRONMENTAL REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF MEETING THE ENVIRONMENTAL REQUIREMENTS OF ND1002000.
4. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS OF ND1015404 SECTION .
5. BURN-IN (BY SUPPLIER):
   - A. ALL CAPACITORS SHALL BE SUBJECTED TO A 250 HOUR BURN-IN PERIOD AT RATED VOLTAGE AND +85°C. UNDER THESE CONDITIONS THE FOLLOWING RESULTS SHALL BE OBTAINED. PRE AND POST BURN-IN DATA REPRESENTED BY THESE RESULTS SHALL BE SUPPLIED WITH ALL CAPACITORS SHIPPED. DATA SHALL CONSIST OF MEASUREMENTS FOR EACH UNIT OF THE LOT.
     - (1) THE CAPACITANCE SHALL NOT EXCEED THE INITIAL REQUIREMENTS OF THE APPLICABLE DRAWING.
     - (2) THE LEAKAGE CURRENT AND DISSIPATION FACTOR SHALL NOT EXCEED THE INITIAL LIMITS SPECIFIED BY THE APPLICABLE DRAWING.
6. INTERPRET DRAWING PER MIL-D-70327.

REV-	REV-	REV-
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

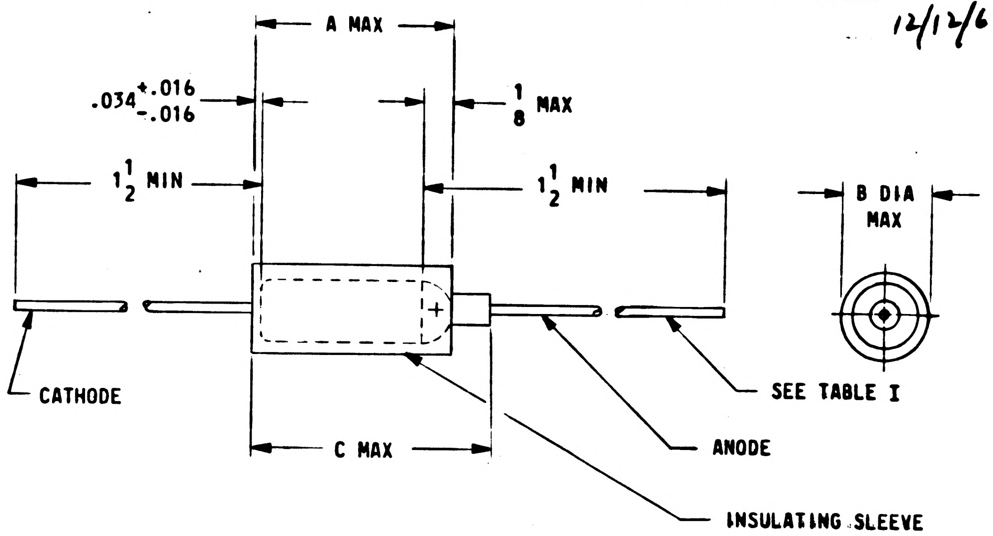


TABLE I

CASE SIZE	NOM LEAD SIZE		DIMENSIONS		
	AWG	DIA	A MAX	B MAX	C MAX
A	24	.020	.353	.151	.503
B	24	.020	.541	.201	.691
C	22	.0253	.753	.305	.903
D	22	.0253	.853	.367	1.003

ORIGINAL SOURCE OF SUPPLY:

SPRAGUE ELECTRIC COMPANY
NORTH ADAMS, MASSACHUSETTS
CODE IDENT NO. 56289

DATA SOURCE:

SPRAGUE SPECIFICATION
NO'S DV-102A AND DV-103
DATED APRIL 14, 1961

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 29 Nov 62
CHECKED A. Maynard 4 DEC 62
APPROVAL E C Hall 11 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006755

SCALE NONE WT SHEET 1 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL

DASH NO.	CAPACITANCE UF ±10%	CASE STYLE	RATED WORKING VOLTAGE DC AT 25°C	RATED VAC 1/ AT 120 CPS	SPRAGUE PART NUMBER
1	5.6	A	6	.5	250D565X9006A2
2	6.8	A	6	.5	250D685X9006A2
3	47.0	B	6	.5	250D476X9006B2
4	56.0	B	6	.5	250D566X9006B2
5	150.0	C	6	.5	250D157X9006R2
6	180.0	C	6	.5	250D187X9006R2
7	270.0	D	6	.5	250D277X9006S2
8	330.0	D	6	.5	250D337X9006S2
9	3.9	A	10	1.0	250D395X9010A2
10	4.7	A	10	1.0	250D475X9010A2
11	27.0	B	10	1.0	250D276X9010B2
12	33.0	B	10	1.0	250D336X9010B2
13	39.0	B	10	1.0	250D396X9010B2
14	100.0	C	10	1.0	250D107X9010R2
15	120.0	C	10	1.0	250D127X9010R2
16	180.0	D	10	1.0	250D187X9010S2
17	220.0	D	10	1.0	250D227X9010S2
18	2.7	A	15	1.4	250D275X9015A2
19	3.3	A	15	1.4	250D335X9015A2
20	18.0	B	15	1.4	250D186X9015B2
21	22.0	B	15	1.4	250D226X9015B2
22	56.0	C	15	1.4	250D566X9015R2
23	68.0	C	15	1.4	250D686X9015R2
24	82.0	D	15	1.4	250D826X9015S2
25	150.0	D	15	1.4	250D157X9015S2
26	1.2	A	20	2.5	250D125X9020A2
27	1.5	A	20	2.5	250D155X9020A2
28	1.8	A	20	2.5	250D185X9020A2
29	2.2	A	20	2.5	250D225X9020A2
30	8.2	B	20	2.5	250D825X9020B2
31	10.0	B	20	2.5	250D106X9020B2
32	12.0	B	20	2.5	250D126X9020B2
33	15.0	B	20	2.5	250D156X9020B2
34	33.0	C	20	2.5	250D336X9020R2
35	39.0	C	20	2.5	250D396X9020R2
36	47.0	C	20	2.5	250D476X9020R2
37	56.0	D	20	2.5	250D566X9020S2
38	68.0	D	20	2.5	250D686X9020S2
39	82.0	D	20	2.5	250D826X9020S2
40	100.0	D	20	2.5	250D107X9020S2
41	.0047	A	35	3.0	250D472X9035A2
42	.0056	A	35	3.0	250D562X9035A2
43	.0068	A	35	3.0	250D682X9035A2
44	.0082	A	35	3.0	250D822X9035A2
45	.01	A	35	3.0	250D103X9035A2
46	.012	A	35	3.0	250D123X9035A2
47	.015	A	35	3.0	250D153X9035A2
48	.018	A	35	3.0	250D183X9035A2
49	.022	A	35	3.0	250D223X9035A2
50	.027	A	35	3.0	250D273X9035A2
51	.033	A	35	3.0	250D333X9035A2
52	.039	A	35	3.0	250D393X9035A2
53	.047	A	35	3.0	250D473X9035A2
54	.056	A	35	3.0	250D563X9035A2
55	.068	A	35	3.0	250D683X9035A2
56	.082	A	35	3.0	250D823X9035A2
57	0.1	A	35	3.0	250D104X9035A2
58	0.12	A	35	3.0	250D124X9035A2
59	0.15	A	35	3.0	250D154X9035A2
60	0.18	A	35	3.0	250D184X9035A2
61	0.22	A	35	3.0	250D224X9035A2
62	0.27	A	35	3.0	250D274X9035A2
63	0.33	A	35	3.0	250D334X9035A2
64	0.39	A	35	3.0	250D394X9035A2
65	0.47	A	35	3.0	250D474X9035A2
66	0.56	A	35	3.0	250D564X9035A2
67	0.68	A	35	3.0	250D684X9035A2
68	0.82	A	35	3.0	250D824X9035A2
69	1.0	A	35	3.0	250D105X9035A2
70	1.2	B	35	3.0	250D125X9035B2
71	1.5	B	35	3.0	250D155X9035B2
72	1.8	B	35	3.0	250D185X9035B2

1/ BIAS TO PREVENT VOLTAGE REVERSAL. PEAK AC INCLUDING SURGES + DC NOT TO EXCEED DC RATINGS AT 25°C.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 **DATE** 12/12/62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 29 Nov 62
CHECKED A Maynard 4 DEC 62
APPROVAL E C Hall 11 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 2 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006755

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

DASH NO.	CAPACITANCE UF ±10%	CASE STYLE	RATED WORKING VOLTAGE DC AT 25°C	RATED VAC 1/ AT 120 CPS	SPRAGUE PART NUMBER
73	2.2	B	35	3.0	250D225X9035B2
74	2.7	B	35	3.0	250D275X9035B2
75	3.3	B	35	3.0	250D335X9035B2
76	3.9	B	35	3.0	250D395X9035B2
77	4.7	B	35	3.0	250D475X9035B2
78	5.6	B	35	3.0	250D565X9035B2
79	6.8	B	35	3.0	250D685X9035B2
80	8.2	C	35	3.0	250D825X9035R2
81	10.0	C	35	3.0	250D106X9035R2
82	12.0	C	35	3.0	250D126X9035R2
83	15.0	C	35	3.0	250D156X9035R2
84	18.0	C	35	3.0	250D186X9035R2
85	22.0	C	35	3.0	250D226X9035R2
86	27.0	D	35	3.0	250D276X9035S2
87	33.0	D	35	3.0	250D336X9035S2
88	39.0	D	35	3.0	250D396X9035S2
89	47.0	D	35	3.0	250D476X9035S2

1/ BIAS TO PREVENT VOLTAGE REVERSAL. PEAK AC INCLUDING SURGES + DC NOT TO EXCEED DC RATINGS AT 25°C.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 **DATE** 12/12/62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —#— DECIMALS ± —#— ANGLES ± —#—
DO NOT SCALE THIS DRAWING
MATERIAL —#—
HEAT TREATMENT —#—
FINAL FINISH —#—

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Gary Wheeler DATE 29 Nov 62
CHECKED [illegible] 11 Dec 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL [illegible] 12/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, TANTALUM
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006755
SCALE NONE
WT
SHEET 3 OF 3

1006755

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006756 | A | Ⓜ

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & ADDED PROCUREMENT NOTE 5 PER TDRR 00468	2-27-63	ECH WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. EACH UNIT SHALL BE CAPABLE OF MEETING ALL THE REQUIREMENTS OF SPECIFICATION MIL-C-15305, FOR GRADE I, CLASS B UNITS, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
2. CONSTRUCTION REQUIREMENTS:
   - A. LEADS: EACH UNIT SHALL HAVE WELDABLE GOLDCOATED DUMET LEADS PER PS 1015401 GREASE AND OIL FREE.

     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. TO AVOID CONFUSION, IT SHOULD BE UNDERSTOOD TO PERFORM THE LEAD BEND TEST THAT THE COMPONENT BODY SHALL BE HELD IN A VERTICAL POSITION, WITH A TWO (2) POUND WEIGHT SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT WHILE IN THE SAME PLANE THROUGH 90° IN ONE DIRECTION THEN BACK 180° TO THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

     EACH LEAD SHALL WITHSTAND AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - B. MARKING: MARK PER MIL-STD-130, WITH NASA NO., REV. LETTER, MANUFACTURER'S NAME AND/OR SYMBOL, INDUCTANCE RATING AND TYPE NUMBER.
3. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN NASA SPECIFICATION ND1015404 CLASS 2.
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
5. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPECIFICATION AND PHYSICAL DIMENSIONS.
   - B. UPON SPECIFIC INSTRUCTION BY TECHNICAL DIRECTIVE (TD) PROCURE THIS PART AS CHANGE LETTER A BY ORDERING TO VENDOR CATALOGUE NUMBER & SPECIFICATIONS. REFERENCE ND1002034.
   - C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

ORIGINAL SOURCE OF SUPPLY.

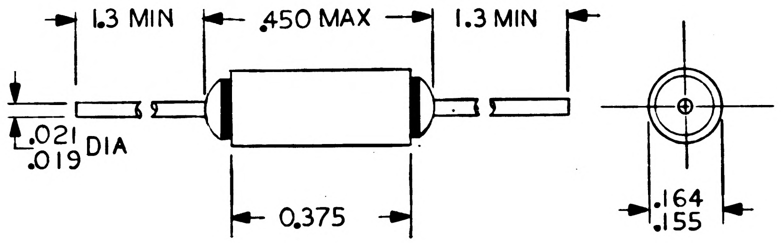
HYTRONICS INC.

[illegible]

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034.FOR THIS DWG.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9-13-62



MASTER

A	A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. CHIN DATE 7-11-62
CHECKED Joe Martin
APPROVAL W.B. Turner
APPROVAL Eldon C Hall
NASA APPROVAL W.J. Rhine 9-13-62
MIT APPROVAL W.A. Kupfer 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CHOKE, RF

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006756
SCALE NONE WT — SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006756 A

Ⓜ

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00468	2-27-63	ECH WK

DASH NO	L	Q MIN		APPROX FO	CD	MIN RP		MIN RP		MAX RES	MAX I	INCR * I	
	uH		MC	MC	uuF	KΩ	MC	KΩ	MC	Ω	MA	MA	
1	100	50.4	.79	15.0	1.0	62	5.0	62	15.0	2.6	345	157	
2	8.2	36	7.9	57.5	.92	33	20	57	57.5	1.3	500	500	
3	1.0	35.6	7.9	164	.92	12	75.0	13	164	.062	2300	2300	
4	1.5	32.8	7.9	135	.92	16	50	17	135	.16	1420	1420	
5	2.2	33.6	7.9	112	.92	21	40	23	112	.19	1300	1300	
6	3.9	32	7.9	84.5	.92	26	30	34	84.5	.33	1000	1000	
7	22	37.6	2.5	47	.50	13	15	17	47	.95	590	220	
8	33	34.4	2.5	40	.48	23	12	23	40	1.2	520	193	
9	47	36.8	2.5	33	.49	31	12	31	33	1.8	420	177	

* INCREMENTAL INDUCTANCE: CURRENT REQUIRED FOR A REDUCTION OF 5% IN INDUCTANCE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9-13-62

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE 2
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. CHIN DATE 7-11-62
CHECKED Joe Martori
APPROVAL WB Turner
APPROVAL Eldon C Hall
NASA APPROVAL WJ Rhine 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CHOKE, RF
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006756
SCALE NONE WT — SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006757 Ⓜ

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	TAKEN FROM BUWEPS DWG 2318921		
A	ADDED PROCUREMENT NOTE 5 PER TDRR 00433	2-20-63	WJB WK

NOTES:

1. GENERAL REQUIREMENTS:

   A. ELECTRICAL:

   CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.

   TEMPERATURE COEFFICIENT OF RESISTANCE (0°C - 100°C): .0048.

   B. MECHANICAL (BEFORE FORMING):

   COEFFICIENT OF LINEAR EXPANSION (20°C - 100°C): .000013.

   TENSILE STRENGTH AT 20°C:

   135,000 PSI, MAXIMUM.
   60,000 PSI, MINIMUM.

   APPROXIMATE MELTING POINT: 1450°C.
   ELONGATION: 20% MINIMUM, PER 2 INCHES.
   WIRE SIZE: AS DELINEATED IN TABLE 1.

2. CONSTRUCTION REQUIREMENTS:

   A. CHEMICAL COMPOSITION OF MATERIAL

NICKEL	99.56 PERCENT
COPPER	.02 PERCENT
IRON	.095 PERCENT
CARBON	.04 PERCENT
MANGANESE	.25 PERCENT
SILICON	.03 PERCENT
SULPHUR	.005 PERCENT

   B. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER, CLEAN, SOUND, SMOOTH AND FREE FROM INJURIOUS FOREIGN MATERIAL, SCRAPES, COLD SHUTS, LAPS, CRACKS, TWISTS, SCALE, DAMAGED ENDS, WELDS, SCORES, PITS, GALLS AND OTHER DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.

   C. PACKAGING:

   THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.

   THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL MAXIMUM WEIGHT OF THE WIRE SHALL NOT EXCEED FIFTEEN (15) POUNDS.

3. ENVIRONMENTAL REQUIREMENTS: PER ND1002000.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327. (AS APPLICABLE).

5. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. - & PHYSICAL DIMENSIONS.

   B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.

   C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9-13-62

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	
APPLICATION		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —	DO NOT SCALE THIS DRAWING	
MATERIAL	SEE NOTE 2	
HEAT TREATMENT	—	
FINAL FINISH	—	

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DRAWN R. CHIN DATE 7-12-62 CHECKED Joe Morton APPROVAL W B Turner APPROVAL Eldon C Hall	**WIRE, ELECTRICAL NICKEL, SQUARE & RECTANGULAR SPECIFICATION CONTROL DRAWING**
NASA APPROVAL W J Rhine 9-13-62	CODE IDENT NO. — SIZE C — NASA DRAWING NO. 1006757
MIT APPROVAL 9/13/62	SCALE NONE — WT — — SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006757 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	TAKEN FROM BUWEPS DWG 2318921		
A	ADDED PROCUREMENT NOTE 5 PER TDRR 00433	2-20-63	WB WR
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WR

NOTES:

1. GENERAL REQUIREMENTS:
   A. ELECTRICAL:
      CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
      TEMPERATURE COEFFICIENT OF RESISTANCE (0°C - 100°C): .0048.
   B. MECHANICAL (BEFORE FORMING):
      COEFFICIENT OF LINEAR EXPANSION (20°C - 100°C): .000013.
      TENSILE STRENGTH AT 20°C:
        135,000 PSI, MAXIMUM.
        60,000 PSI, MINIMUM.
      APPROXIMATE MELTING POINT: 1450°C.
      ELONGATION: 20% MINIMUM, PER 2 INCHES.
      WIRE SIZE: AS DELINEATED IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   A. CHEMICAL COMPOSITION OF MATERIAL

NICKEL	99.56 PERCENT
COPPER	.02 PERCENT
IRON	.095 PERCENT
CARBON	.04 PERCENT
MANGANESE	.25 PERCENT
SILICON	.03 PERCENT
SULPHUR	.005 PERCENT

   B. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER, CLEAN, SOUND, SMOOTH AND FREE FROM INJURIOUS FOREIGN MATERIAL, SCRAPES, COLD SHUTS, LAPS, CRACKS, TWISTS, SCALE, DAMAGED ENDS, WELDS, SCORES, PITS, GALLS AND OTHER DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.
   C. PACKAGING:
      THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
      THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL MAXIMUM WEIGHT OF THE WIRE SHALL NOT EXCEED FIFTEEN (15) POUNDS.
3. ENVIRONMENTAL REQUIREMENTS: PER ND1002000.
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327. (AS APPLICABLE).
5. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. - & PHYSICAL DIMENSIONS.
   B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

FOR INFORMATION ONL

CLASS B RELEASE TDR No. 00027 DATE 9-13-62

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
−1	.0100 X .0200	.2356
−2	.0100 X .0300	.1571
−3	.0200 X .0200	.1178
−4	.0250 X .0250	.0754
−5	.0100 X .0500	.0942
−6	.0100 X .01500	.3142
−7	.005 X .020	.4712

Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 2
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL [illegible] 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006757
SCALE NONE WT — SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006757 C

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. ELECTRICAL:

     CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.

     TEMPERATURE COEFFICIENT OF RESISTANCE (0°C - 100°C): .0048.
   - B. MECHANICAL (BEFORE FORMING):

     COEFFICIENT OF LINEAR EXPANSION (20°C - 100°C): .000013.

     TENSILE STRENGTH AT 20°C:

     135,000 PSI, MAXIMUM.
     60,000 PSI, MINIMUM.

     APPROXIMATE MELTING POINT: 1450°C.
     ELONGATION: 20% MINIMUM, PER 2 INCHES.
     WIRE SIZE: AS DELINEATED IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. CHEMICAL COMPOSITION OF MATERIAL

NICKEL	99.56 PERCENT
COPPER	.02 PERCENT
IRON	.095 PERCENT
CARBON	.04 PERCENT
MANGANESE	.25 PERCENT
SILICON	.03 PERCENT
SULPHUR	.005 PERCENT

   - B. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER, CLEAN, SOUND, SMOOTH AND FREE FROM INJURIOUS FOREIGN MATERIAL, SCRAPES, COLD SHUTS, LAPS, CRACKS, TWISTS, SCALE, DAMAGED ENDS, WELDS, SCORES, PITS, GALLS AND OTHER DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.
   - C. PACKAGING:

     THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.

     THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL MAXIMUM WEIGHT OF THE WIRE SHALL NOT EXCEED FIFTEEN (15) POUNDS.
3. ENVIRONMENTAL REQUIREMENTS: PER ND1002000.
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327. (AS APPLICABLE).

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 **DATE** 9-13-62

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712

Ⓒ REPLACES REV B WITH CHANGE

MASTER

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 2

HEAT TREATMENT —

FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Eldon C Hall

NASA APPROVAL 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006757

SCALE NONE | WT — | SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D 1006757

(M)

REVISIONS "B" RELEASE C0027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK

NOTES:

1. GENERAL REQUIREMENTS:
   A. MATERIAL: SHALL BE IN ACCORDANCE WITH ND 1015400.
   B. ELECTRICAL:
      CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   A. PACKAGING:
      THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 2
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL W Kupfer 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006757 E

REVISIONS "B" RELEASE C0027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	2 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WSK.

M

M

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL:
     CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING:
     THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712
-8	.0200 DIA	.1500

Ⓒ REPLACES REV B WITH CHANGE

MASTER

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 1

HEAT TREATMENT —

FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Marton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL W Kupfer 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006757 | F

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WSR.
F	REVISED PER TDRR 01452	6/5/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL: CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING: THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712
-8	.0200 DIA	.1500
-9	.0320 DIA	.0585

MASTER

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 1
HEAT TREATMENT: —
FINAL FINISH: —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT —
SHEET 1 OF 1

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006757 F

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01388	5-29-63	WSR.
F	REVISED PER TDRR 01452	6/5/63	
G	REVISED PER TDRR 02737	8/21/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL:

     CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING:

     THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
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TABLE 1

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-3	.0200 X .0200	.1178
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-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712
-8	.0200 DIA	.1500
-9	.0320 DIA	.0585
-10	.0403 DIA	.0361

MASTER

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 1

HEAT TREATMENT —

FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Marton
APPROVAL W B Turner
APPROVAL Eldon C Hall

NASA APPROVAL 9-17-62

MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

H 1006757

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WJR.
F	REVISED PER TDRR 01452	6/5/63	
G	REVISED PER TDRR 02737	8/21/63	
H	REVISED PER TDRR 02968	5 Sep 63	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL: CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING: THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712
-8	.0200 DIA	.1500
-9	.0320 DIA	.0585
-10	.0403 DIA	.0361
-11	.0250 DIA	.0958

MASTER

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Ellen C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006757 J

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WSR
F	REVISED PER TDRR 01452	6/5/63	
G	REVISED PER TDRR 02737	8/21/63	
H	REVISED PER TDRR 02968	5 Sep 63	WK
J	REVISED PER TDRR 03394	9/26/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL: CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING: THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712
-8	.0200 DIA	.1500
-9	.0320 DIA	.0585
-10	.0403 DIA	.0361
-11	.0250 DIA	.0958
-12	.0100 DIA	.6000

MASTER

© REPLACES REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Merton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006757
SCALE NONE WT — SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

K 1006757

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS "B" RELEASE 00027 9-13-62		
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WSK.
F	REVISED PER TDRR 01452	6/5/63	
G	REVISED PER TDRR 02737	8/21/63	
H	REVISED PER TDRR 02968	5 Sep 63	WK
J	REVISED PER TDRR 03394	9/26/63	
K	REVISED PER TDRR 05198	20 Dec 63	EOK WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE UNPLATED NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL:
     CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING:
     THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
4. WIRE ORDERED BY THIS DASH NUMBER SHALL BE GOLD PLATED PER MIL-G-45204 AS A SPECIFIED OPTION IN ND 1015400.

TABLE 1

DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-1	.0100 X .0200	.2356
-2	.0100 X .0300	.1571
-3	.0200 X .0200	.1178
-4	.0250 X .0250	.0754
-5	.0100 X .0500	.0942
-6	.0100 X .01500	.3142
-7	.005 X .020	.4712
-8	.0200 DIA	.1500
-9	.0320 DIA	.0585
-10	.0403 DIA	.0361
-11	.0250 DIA	.0958
-12	.0100 DIA	.6000
-13 SEE NOTE 4	.0200 DIA	.1500

MASTER

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE WT — SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006757 L

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01388	5-29-63	WK.
F	REVISED PER TDRR 01452	6/5/63	
G	REVISED PER TDRR 02737	8/21/63	
H	REVISED PER TDRR 02968	5 Sep 63	WK
J	REVISED PER TDRR 03394	9/26/63	
K	REVISED PER TDRR 05198	20 Dec 63	WK
L	REVISED PER TDRR 06437	2/18/64	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE UNPLATED NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL:
     CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1.
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING:
     THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
4. WIRE ORDERED BY THESE DASH NUMBERS SHALL BE GOLD PLATED PER MIL-G-45204 AS A SPECIFIED OPTION IN ND 1015400.

TABLE 1

DASH NO. (SEE NOTE 4)	DASH NO.	CONDUCTOR DIMENSION ±0.0005	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-14	-1	.0100 X .0200	.2356
-15	-2	.0100 X .0300	.1571
-16	-3	.0200 X .0200	.1178
-17	-4	.0250 X .0250	.0754
-18	-5	.0100 X .0500	.0942
-19	-6	.0100 X .01500	.3142
-20	-7	.005 X .020	.4712
-13	-8	.0200 DIA	.1500
-21	-9	.0320 DIA	.0585
-22	-10	.0403 DIA	.0361
-23	-11	.0250 DIA	.0958
-24	-12	.0100 DIA	.6000

MASTER

© REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE 1
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Marton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT —
SHEET 1 OF 1

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006757 M

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WJK.
F	REVISED PER TDRR 01452	6/5/63	
G	REVISED PER TDRR 02737	8/21/63	
H	REVISED PER TDRR 02968	5 Sep 63	WK
J	REVISED PER TDRR 03394	9/26/63	
K	REVISED PER TDRR 05198	20 Dec 63	EDK WK
L	REVISED PER TDRR 06437	2/18/64	WK
M	REVISED PER TDRR 13992	12-22-64	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE UNPLATED NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL:
     CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1. (FOR REF ONLY)
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING:
     THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
4. WIRE ORDERED BY THESE DASH NUMBERS SHALL BE GOLD PLATED PER MIL-G-45204 AS A SPECIFIED OPTION IN ND 1015400.

TABLE 1

DASH NO. (SEE NOTE 4)	DASH NO.	CONDUCTOR DIMENSIONS	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-14	-1	.0100 ± .0005 X .0200 ± .001	.2356
-15	-2	.0100 ± .0005 X .0300 ± .001	.1571
-16	-3	.0200 ± .0005 X .0200 ± .0005	.1178
-17	-4	.0250 ± .0005 X .0250 ± .0005	.0754
-18	-5	.0100 ± .0005 X .0500 ± .001	.0942
-19	-6	.0100 ± .0005 X .0150 ± .001	.3142
-20	-7	.0050 ± .0005 X .020 ± .001	.4712
-13	-8	.0200 ± .0005 DIA.	.1500
-21	-9	.0320 ± .0005 DIA	.0585
-22	-10	.0403 ± .0005 DIA	.0361
-23	-11	.0250 ± .0005 DIA	.0958
-24	-12	.0100 ± .0005 DIA	.6000

MASTER

Ⓒ REPLACES REV B WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —#— DECIMALS ± —#— ANGLES ± —#—
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE 1
HEAT TREATMENT —#—
FINAL FINISH —#—

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Marton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT. APPROVAL W Kupfer 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006757
SCALE NONE WT —#— SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

N 1006757

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WSK.
F	REVISED PER TDRR 01452	6/5/63	
G	REVISED PER TDRR 02737	8/21/63	
H	REVISED PER TDRR 02968	5 Sep 63	WK
J	REVISED PER TDRR 03394	9/26/63	
K	REVISED PER TDRR 05198	20 Dec 63	WK
L	REVISED PER TDRR 06437	2/18/64	WK
M	REVISED PER TDRR 13992	12-22-64	WK
N	REVISED PER TDRR 18491	4/27/65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE UNPLATED NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL: CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1. (FOR REF ONLY)
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING: THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
4. WIRE ORDERED BY THESE DASH NUMBERS SHALL BE GOLD PLATED PER MIL-G-45204 AS A SPECIFIED OPTION IN ND 1015400.

TABLE 1

DASH NO. (SEE NOTE 4)	DASH NO.	CONDUCTOR DIMENSIONS	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-14	-1	.0100 ± .0005 X .0200 ± .001	.2356
-15	-2	.0100 ± .0005 X .0300 ± .001	.1571
-16	-3	.0200 ± .0005 X .0200 ± .0005	.1178
-17	-4	.0250 ± .0005 X .0250 ± .0005	.0754
-18	-5	.0100 ± .0005 X .0500 ± .001	.0942
-19	-6	.0100 ± .0005 X .0150 ± .001	.3142
-20	-7	.0050 ± .0005 X .020 ± .001	.4712
-13	-8	.0200 ± .0005 DIA.	.1500
-21	-9	.0320 ± .0005 DIA	.0585
-22	-10	.0403 ± .0005 DIA	.0361
-23	-11	.0250 ± .0005 DIA	.0958
-24	-12	.0100 ± .0005 DIA	.6000
	-25	.003 X .020	.791

Ⓒ REPLACES REV B WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± # DECIMALS ± # ANGLES ± #
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 1

HEAT TREATMENT #

FINAL FINISH #

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT #
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

P 1006757

REVISIONS "B" RELEASE 00027 9-13-62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO A RELEASE PER TDRR 00951	24 APR. 1963	WK
E	REVISED PER TDRR 01398	5-29-63	WJK.
F	REVISED PER TDRR 01452	6/5/63	[illegible]
G	REVISED PER TDRR 02737	8/21/63	[illegible]
H	REVISED PER TDRR 02968	5 Sep 63	WK
J	REVISED PER TDRR 03394	9/26/63	[illegible]
K	REVISED PER TDRR 05198	20 Dec 63	WK
L	REVISED PER TDRR 06437	2/18/64	WK
M	REVISED PER TDRR 13992	12-22-64	WK
N	REVISED PER TDRR 18491	4/27/66	WK
P	REVISED PER TDRR 22885	10-13-66	[illegible]

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE UNPLATED NICKEL IN ACCORDANCE WITH PS 1015400. A CERTIFICATE OF COMPLIANCE WILL ACCOMPANY ALL LOTS SHIPPED.
   - B. ELECTRICAL: CONDUCTOR RESISTANCE (DC) AT 20°C: SHALL BE AS SHOWN IN TABLE 1. (FOR REF ONLY)
2. CONSTRUCTION REQUIREMENTS:
   - A. PACKAGING: THE WIRE SHALL BE SHIPPED TOGETHER WITH A DESICCANT AND SEALED IN A PACKAGE.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
4. WIRE ORDERED BY THESE DASH NUMBERS SHALL BE GOLD PLATED PER MIL-G-45204 AS A SPECIFIED OPTION IN ND 1015400.

TABLE 1

DASH NO. (SEE NOTE 4)	DASH NO.	CONDUCTOR DIMENSIONS	CONDUCTOR RESISTANCE OHMS/FOOT AT 20°C ± 10%
-14	-1	.0100 ± .0005 X .0200 ± .001	.2356
-15	-2	.0100 ± .0005 X .0300 ± .001	.1571
-16	-3	.0200 ± .0005 X .0200 ± .0005	.1178
-17	-4	.0250 ± .0005 X .0250 ± .0005	.0754
-18	-5	.0100 ± .0005 X .0500 ± .001	.0942
-19	-6	.0100 ± .0005 X .0150 ± .001	.3142
-20	-7	.0050 ± .0005 X .020 ± .001	.4712
-13	-8	.0200 ± .0005 DIA.	.1500
-21	-9	.0320 ± .0005 DIA	.0585
-22	-10	.0403 ± .0005 DIA	.0361
-23	-11	.0250 ± .0005 DIA	.0958
-24	-12	.0100 ± .0005 DIA	.6000
-26	-25	.003 X .020	.791

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 1

HEAT TREATMENT —

FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-12-62
CHECKED Joe Marton
APPROVAL W B Turner
APPROVAL Eldon C Hall

NASA APPROVAL W J Rhine 9-13-62

MIT APPROVAL [illegible] 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL, ROUND, SQUARE & RECTANGULAR
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006757
SCALE NONE
WT —
SHEET 1 OF 1

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1006759 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED TAB TO TRANSISTOP CAN	10-1-62	
B	REVISED PER TDRR 00061	10-8-62	WR 10/10/62

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ELECTRICAL CHARACTERISTICS: SEE SHEET 2.
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN
   - B. CASE: METAL, SUITABLY PROTECTED TO WITHSTAND ENVIRONMENTAL CONDITIONS.
   - C. LEADS: THREE (3) FLEXIBLE AND WELDABLE SOLID "KOVAR" (PROPRIETARY) CONDUCTORS; GREASE AND OIL FREE, GOLD FLASHED, PER ND 1002001.

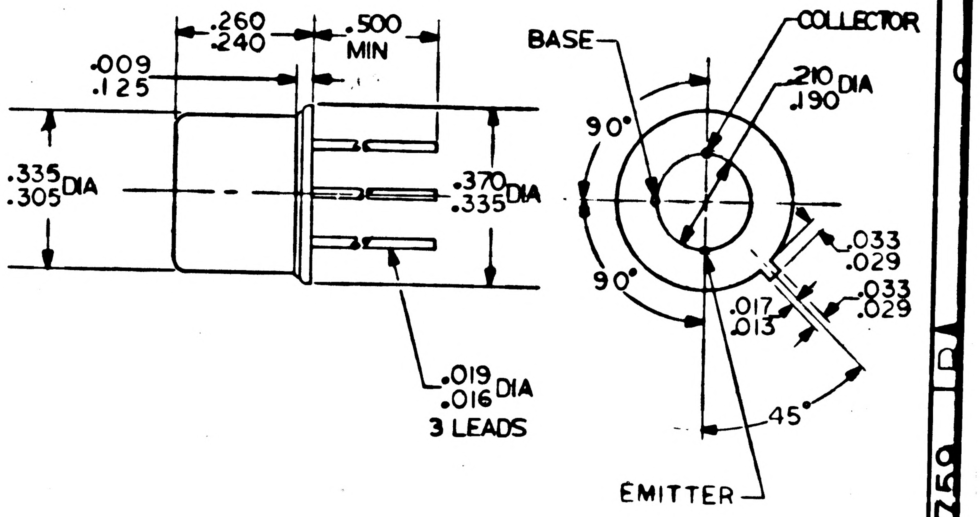
     A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL WITHSTAND AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

     COLLECTOR: ELECTRICALLY CONNECTED TO CASE. (INTERNALLY).
   - D. HEADER: SHALL BE HERMETICALLY (GLASS-"KOVAR") SEALED AND IMPERVIOUS TO LIGHT.
   - E. MARKING: PER MIL-S-19500 AND SHALL INCLUDE THE MANUFACTURER'S NAME AND/OR SYMBOL, DATE CODE, AND TYPE NUMBER. THE NASA NO. SHALL APPEAR ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.
3. ENVIRONMENTAL REQUIREMENTS: SHALL MEET THE REQUIREMENTS OF ND1002000.
4. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9-13-62



REV-	REV-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 2

HEAT TREATMENT —

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DRAWN DEMPSKI DATE 7-11-62
CHECKED Joe Morton
APPROVAL W B Turner
APPROVAL Eldon C. Hall
NASA APPROVAL 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE; NPN MEDIUM POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT —	SHEET 1 OF 2

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B 1006759 Ⓜ

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	SEE SHEET 1	10-1-62	
B	SEE SHEET 2 TDRR 00060	10-962	10/10/62

DESIGN PARAMETERS AT 25°C AMBIENT UNLESS OTHERWISE SPECIFIED

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = 50$ $I_E = 0$		25	muA
COLL. CUTOFF CURRENT 150 C	I_{CBO}	$V_{CB} = 50$ $I_E = 0$	1	10	uA
COLL. BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C = 100uA$ $I_{E=0}$	60		Vdc
EMITTER BASE REVERSE CURRENT	I_{EBO}	$V_{EB} = 4V$ $I_C = 0$		0.1	uA
EMITT. BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E = 100uA$ $I_C = 0$	5		Vdc
COLL. EMITT. SUSTAINING VOLTAGE	V_{CEO} SUST	$I_C = 10mA$ PULSED $I_B = 0$	30		Vdc
COLL. EMITT. CURRENT RESISTANCE RETURN	I_{CER}	$V_{CE} = 40V$ $R_{BE} = 100K$		10	uA
D.C. CURRENT GAIN	h_{FE}	$I_C = 500mA$ $V_{CE} = 10V$	30		
D.C. CURRENT GAIN	h_{FE}	$I_C = 100mA$ $V_{CE} = 10V$	40	120	
D.C. CURRENT GAIN	h_{FE}	$I_C = 1mA$ $V_{CE} = 10V$	20		
BASE EMITTER SATURATION VOLTAGE	V_{BE}	$I_C = 500mA$ $I_B = 50mA$	1.1	1.3	Vdc
COLL. EMITT. SATURATION VOLTAGE	V_{CE} SAT	$I_C = 500mA$ $I_B = 50mA$		1.0	
FORWARD CURRENT TRANSFER RATE	h_{fe}	$V_{CE} = 10V$ $I_C = 50mA$ f 20mC	3		
COLLECTOR CAPACITANCE	C_{ob}	$V_{CB} = 10V$ $I_E = 0$		20	Pf

MAXIMUM RATINGS AT 25°C AMBIENT UNLESS OTHERWISE SPECIFIED

COLLECTOR TO EMITTER VOLTAGE R_{BE} =	V_{CEO}	30Vdc
COLLECTOR TO BASE VOLTAGE	V_{CBO}	60Vdc
EMITTER TO BASE VOLTAGE	V_{EBO}	5Vdc
D.C. COLLECTOR CURRENT	I_C	1.0A
TOTAL POWER DISSIPATION CASE AT 25°C	P_T	3W
THERMAL RESISTANCE = JUNCTION TO CASE	$\theta_{J\ C}$	60° C/W
JUNCTION TEMPERATURE RANGE, OPERATING		65°C TO 200°C
JUNCTION TEMPERATURE RANGE, STORAGE		65°C TO 300°C
LEAD TEMPERATURE SOLDERING		300° C NO TIME LIMIT

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9-13-62

1006759

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

INCHES
0 1 2
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DRAWN TROY DATE 9-4-62
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APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL 9-13-62
MIT APPROVAL 9/13/62

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TRANSISTOR, SILICON TYPE; NPN MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006759
SCALE WT SHEET 2 OF 2

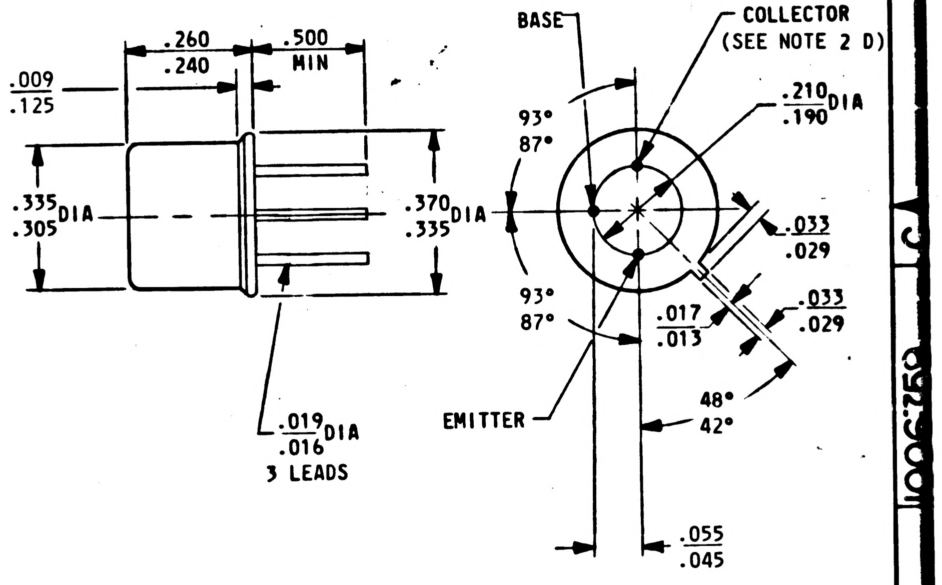
C | 1006759

SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR00400	2-13-63	WC

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 30 VOLTS DC.
     - (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 60 VOLTS DC.
     - (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 5 VOLTS DC.
     - (4) COLLECTOR CURRENT (I_C): 0.8 AMPERE
     - (5) POWER DISSIPATION: 2.5 WATTS AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT.
     - (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 219°C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 759. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-5) OUTLINE.
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

C	C	C	C
B	B		
A	A		
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

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DRAWN A. Marts DATE 11 Feb 63
CHECKED 11 Feb 63
APPROVAL 2-13-63
APPROVAL

NASA APPROVAL W. J. 2-13-63

MIT APPROVAL W 13 Feb 63

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TRANSISTOR, SILICON, TYPE NPN MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006759
SCALE NONE
WT
SHEET 1 OF 4

MASTER

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1006759 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00400	2-13-63	WK

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8}/CC ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 1.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72^{+8}_{-4} HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168^{+12}_{-6} HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL 13Feb63

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TRANSISTOR, SILICON, TYPE NPN, MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006759
SCALE NONE
WT
SHEET 2 OF 4

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00400	2-12-63	

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	TEST CONDITIONS	LIMITS		UNIT	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO = 3	LTPD* = 10 MAX ACC NO = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = 50, I_E = 0$		25	muA	100%	LTPD* = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150 C	I_{CBO}	$V_{CB} = 50, I_E = 0$		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C = 100$ uA, $I_E = 0$	60		Vdc		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	$V_{EB} = 4$ V, $I_C = 0$		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E = 100$ uA, $I_C = 0$	5		Vdc		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	$I_C = 10$ mA PULSED $I_B = 0$	30		Vdc		
COLLECTOR-EMITTER CURRENT RES RET	I_{CER}	$V_{CE} = 40$ V, $R_{BE} = 100$ K		10	uA		
COLLECTOR-EMITTER THRESHOLD CUR	I_{CEX}	$V_{BE} = 0.45$ V, $V_{CE} = 50$ V		1	uA		
DC CURRENT GAIN	h_{FE}	$I_C = 500$ mA, $V_{CE} = 10$ V	25				
DC CURRENT GAIN	h_{FE}	$I_C = 100$ mA, $V_{CE} = 10$ V	40	120			
DC CURRENT GAIN	h_{FE}	$I_C = 1$ mA, $V_{CE} = 10$ V	20				
BASE-EMITTER SATURATION VOLTAGE	V_{BE}	$I_C = 500$ mA, $I_B = 50$ mA	1.1	1.3	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE} SAT	$I_C = 500$ mA, $I_B = 50$ mA		1.0			
FORWARD CURRENT TRANSFER RATIO	h_{fe}	$V_{CE} = 10$ V, $I_C = 50$ mA f = 20 MC	3				
COLLECTOR CAPACITANCE	C_{ob}	$V_{CB} = 10$ V, $I_E = 0$ SEE NOTE 3 D (4), f =140kc		20	pf		

* LTPD PER MIL-S-19500, TABLE IV

REVISION C THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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APPROVAL
NASA APPROVAL W J Rhine 2-13-63
MIT APPROVAL 13 Feb 63

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TRANSISTOR, SILICON, TYPE NPN; MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006759
SCALE NONE WT SHEET 3 OF 4

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00400	2-13-63	

TABLE III

QUALITY DEMONSTRATION TESTS

TEST	TEST CONDITION	LOT	
		1 TO 500	OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2 ** THERMAL SHOCK SEAL TEST	METHOD 1056, CONDITION B (+200°C TO -65°C, 5 CYCLES) SEE NOTE 3 D (3)	↓	LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3 ** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031 T_{stg} = 200° ± 5°C, 1000 HOURS METHOD 2016, 1500 G, 0.5 MSEC, 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G	↓	LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS	↓	λ^* = 10 MAX ACC NO.= 3
SUBGROUP 5 ** LEAD TENSION LEAD FATIGUE	SEE NOTE 3 D (2) SEE NOTE 3 D (1)	↓	LTPD = 20 (COMBINED) MAX ACC NO.= 3

* λ PER MIL-S-19500C TABLE IV

** TESTS TO BE PERFORMED IN SEQUENCE INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 50 V, I_E = 0	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±50% *
DC CURRENT GAIN	hFE	V_{CE} = 10 V, I_C = 100 mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 50 V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = 10 V, I_C = 100 mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 MILLIMICROAMPERES MAY BE CONSIDERED TO BE 5 MILLIMICROAMPERES FOR CALCULATING PERCENTAGE CHANGE.

REVISION C THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Marts DATE 11 Feb 63
CHECKED V. Maynard 11 Feb 63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN; MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006759
SCALE NONE
WT
SHEET 4 OF 4

D	1006759

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

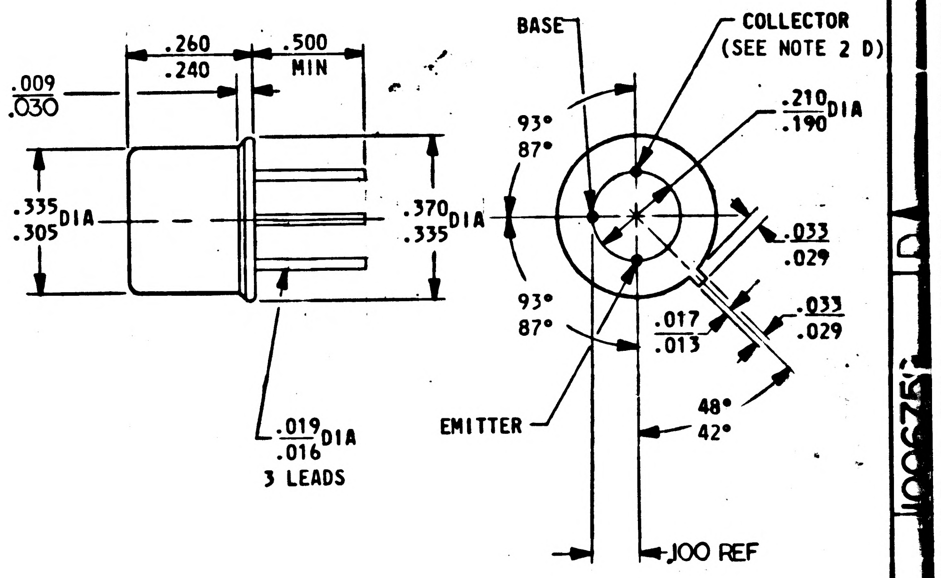
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR00400	2-13-63	WC
D	REVISED PER TDRR 02810	8/28/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 30 VOLTS DC.
     - (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 60 VOLTS DC.
     - (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 5 VOLTS DC.
     - (4) COLLECTOR CURRENT (I_C): 0.8 AMPERE
     - (5) POWER DISSIPATION: 2.5 WATTS AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT.
     - (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 219°C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 759. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-5) OUTLINE.
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



SHEET 1	SHEET 2	SHEET 3	SHEET 4
D	D	D	C
C	C	C	C
B	B		
A	A		

REVISION STATUS OF SHEETS

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT NO 1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN A. Marts DATE 11 Feb 63
CHECKED 11 Feb 63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W. J. 2-13-63
MIT APPROVAL 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT	SHEET 1 OF 4

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00200	2-13-63	
D	REVISED PER TDRR 02810	8/28/63	

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8}/CC ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 2.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72^{+8}_{-4} HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
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CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN DATE 1Feb63
CHECKED 11Feb63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL 13Feb63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN, MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006759
SCALE NONE
WT
SHEET 2 OF 4

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00400	2-12-63	
D	REVISED PER TDRR 02810	8/28/63	

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	TEST CONDITIONS	LIMITS		UNIT	LOT	
			MIN	MAX		1 TO 500	OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO = 3	LTPD* = 10 MAX ACC NO = 3
SUBGROUP 2 COLLECTOR CUTOFF CURRENT	I_{CBO}	$V_{CB} = 50$, $I_E = 0$		25	muA	100%	LTPD* = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150 C	I_{CBO}	$V_{CB} = 50$, $I_E = 0$		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	$I_C = 100$ uA, $I_E = 0$	60		Vdc		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	$V_{EB} = 4$ V, $I_C = 0$		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	$I_E = 100$ uA, $I_C = 0$	5		Vdc		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	$I_C = 10$ mA PULSED $I_B = 0$	30		Vdc		
COLLECTOR-EMITTER CURRENT RES RET	I_{CER}	$V_{CE} = 40$ V, $R_{BE} = 100$ K		10	uA		
COLLECTOR-EMITTER THRESHOLD CUR	I_{CEX}	$V_{BE} = 0.45$ V, $V_{CE} = 50$ V		15	uA		
DC CURRENT GAIN	h_{FE}	$I_C = 500$ mA, $V_{CE} = 10$ V	25				
DC CURRENT GAIN	h_{FE}	$I_C = 100$ mA, $V_{CE} = 10$ V	40	120			
DC CURRENT GAIN	h_{FE}	$I_C = 1$ mA, $V_{CE} = 10$ V	20				
BASE-EMITTER SATURATION VOLTAGE	V_{BE}	$I_C = 500$ mA, $I_B = 50$ mA	1.1	1.3	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	V_{CE} SAT	$I_C = 500$ mA, $I_B = 50$ mA		1.0			
FORWARD CURRENT TRANSFER RATIO	h_{fe}	$V_{CE} = 10$ V, $I_C = 50$ mA f = 20 MC	3				
COLLECTOR CAPACITANCE	C_{ob}	$V_{CB} = 10$ V, $I_E = 0$ SEE NOTE 3 D (4), f = 140kc		20	pf	↓	↓

* LTPD PER MIL-S-19500, TABLE IV

REVISION C THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
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DWG. NO. CONTRACT

DRAWN A Marks DATE 11 Feb 63
CHECKED W Maynard 11 Feb 63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W J Rhine 2-13-63
MIT APPROVAL W Kupfer 13 Feb 63

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HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN; MEDIUM POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006759
SCALE NONE WT
SHEET 3 OF 4

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

E	1006759

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR00400	2-13-63	WC
D	REVISED PER TDRR 02810	8/28/63	
E	REVISED PER TDRR 04911	12/10/63	RPE

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.

   B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:

      (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 30 VOLTS DC.

      (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 60 VOLTS DC.

      (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 5 VOLTS DC.

      (4) COLLECTOR CURRENT (I_C): 0.8 AMPERE

      (5) POWER DISSIPATION; 2.5 WATTS AT +25°C CASE TEMPERATURE.

      (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT.

      (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 219°C/WATT.

   C. TEMPERATURE:

      (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.

      (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.

      (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).

   D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 759. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:

   A. SEMICONDUCTOR: SILICON, NPN.

   B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-5) OUTLINE.

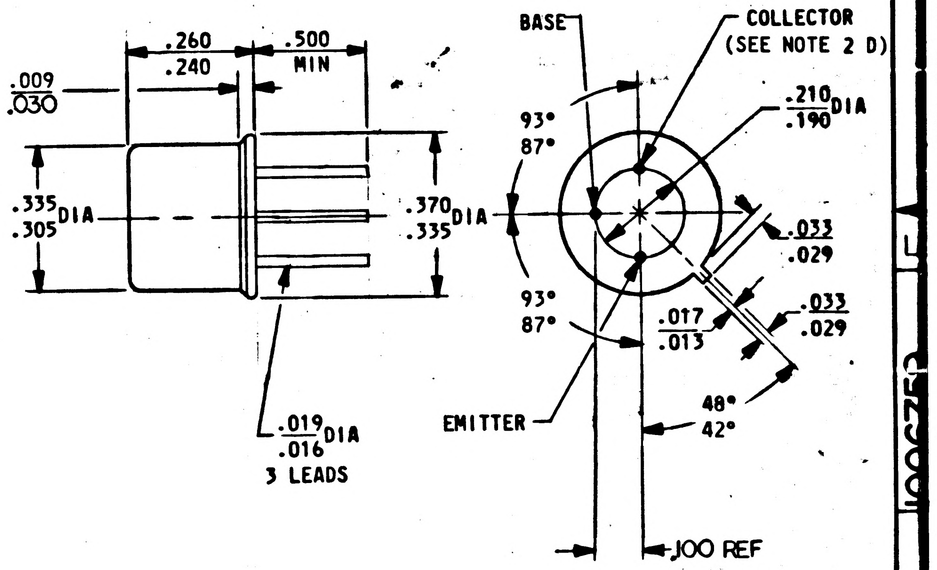
   C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

   D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:

   A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

   B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



E	E	D	C
D	D	D	C
C	C	C	C
B	B		
A	A		
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT NO 1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
NONE
FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Merts DATE 11 Feb 63
CHECKED 11 Feb 63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W. J. 2-13-63
MIT APPROVAL W Cuffer 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006759
SCALE NONE WT SHEET 1 OF 4

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006759 E

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00700	2-13-63	W/K
D	REVISED PER TDRR 02810	8/28/63	
E	REVISED PER TDRR 04911	12/10/63	PR

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS OR CHIPS. THERE SHALL BE NO BUBBLES IN HEADER GLASS IN CONTACT WITH HEADER FLANGE OR TERMINAL LEADS; NO BUBBLES GREATER THAN .015 INCH IN DIAMETER.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 2.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100% ↓	NO REQUIREMENT ↓
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72^{+8}_{-4} HOURS.		
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)		
POWER, BURN-IN	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168^{+12}_{-6}$ HOURS		
SEAL TEST	SEE NOTE 3 D (3)		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN A. Marts DATE 1 Feb 63
CHECKED G. Maynard 11 Feb 63
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON,
TYPE NPN, MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006759
SCALE NONE
WT
SHEET 2 OF 4

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN PER TDRR 00288 UPGRADED TO CLASS A RELEASE	1.18.63	

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   B. EXCEPTIONS:

   (1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

   (2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

   (3) TEMPERATURE COEFFECIENT:

   ± 200P.P.M/°C MAX FROM -55°C TO 150°C.

   (4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ±5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

   (5) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE LETTER G INDICATING PLUS OR MINUS 2 PERCENT RESISTANCE TOLERANCE.

   C. ADDITIONS:

   (1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

   (2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

   A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ±2 SIGMA.

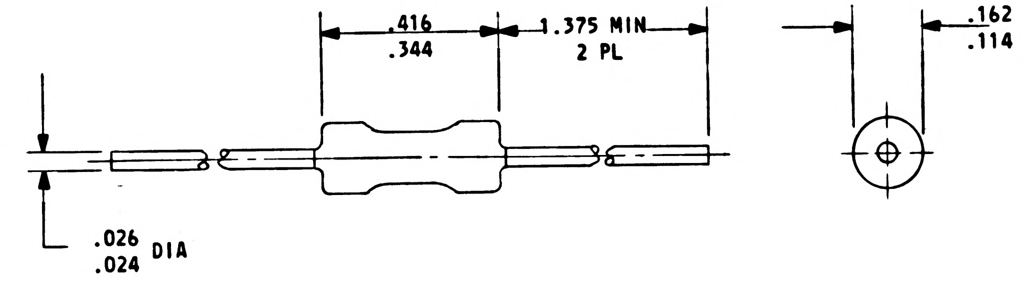
   B) ANY PART WHICH CHANGES MORE THAN 0.75%.

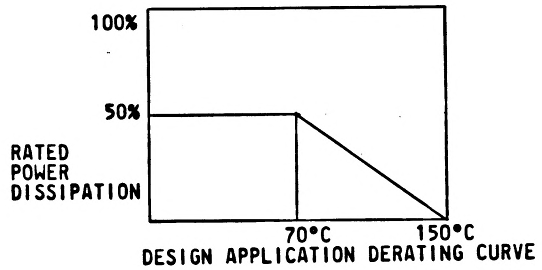
   C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

   D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	85
18		14	38	62	86
20		15	39	63	87
22		16	40	64	88
24		17	41	65	89
27		18	42	66	90
30		19	43	67	91
33		20	44	68	92
36		21	45	69	93
39		22	46	70	94
43		23	47	71	95
47		24	48	72	96
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034





DESIGN APPLICATION DERATING CURVE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 1-17-63
CHECKED 17 Jan 63
APPROVAL 1-18-63
APPROVAL
NASA APPROVAL W J 1-23-63
MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED METAL FILM
1/2 WATT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006760
SCALE 4/1
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006760 A

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
Ⓜ A	REVISED & REDRAWN PER TDRR 00288 UPGRADED TO CLASS A RELEASE	1.18.63		
B	REVISED PER TDRR 00435	2-20-63	4/13	WK

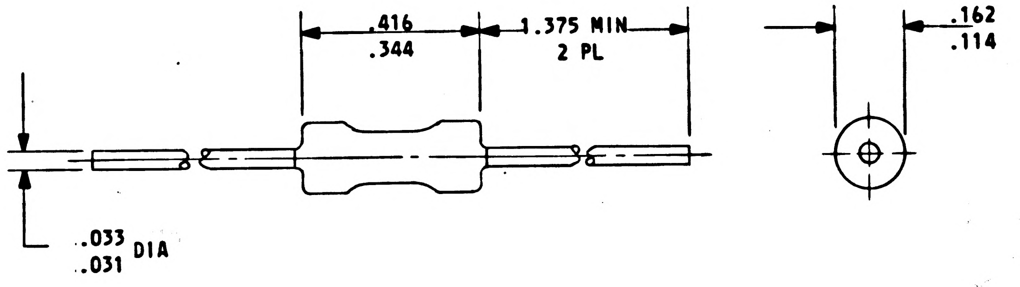
NOTES:

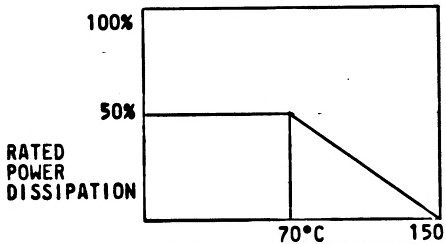
1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - B. EXCEPTIONS:
     - (1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.
     - (2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.
     - (3) TEMPERATURE COEFFECIENT:

       ± 200P.P.M/°C MAX FROM -55°C TO 150°C.
     - (4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ±5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.
     - (5) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE LETTER G INDICATING PLUS OR MINUS 2 PERCENT RESISTANCE TOLERANCE.
   - C. ADDITIONS:
     - (1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.
     - (2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:
       - A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ±2 SIGMA.
       - B) ANY PART WHICH CHANGES MORE THAN 0.75%.
       - C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.
   - D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	85
18		14	38	62	86
20		15	39	63	87
22		16	40	64	88
24		17	41	65	89
27		18	42	66	90
30		19	43	67	91
33		20	44	68	92
36		21	45	69	93
39		22	46	70	94
43		23	47	71	95
47		24	48	72	96
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034





DESIGN APPLICATION DERATING CURVE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Mahoney DATE 1-17-63
CHECKED 17 Jan 63
APPROVAL 1-18-63
APPROVAL

NASA APPROVAL W J R 1-23-63
MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED METAL FILM
1/2 WATT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006760
SCALE 4/1
WT
SHEET 1 OF 1

MASTER

C	1006760

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00288 UPGRADED TO CLASS A RELEASE	1.18.63		
B	REVISED PER TDRR 00435	2-20-63	4/3	WK
C	REVISED PER TDRR 00733	4/3/63		WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   B. EXCEPTIONS:

      (1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED. ENCAPSULATING MATERIAL MAY COVER LEADS ONLY TO EXTENT SHOWN.

      (2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

      (3) TEMPERATURE COEFFECIENT:

      ± 200P.P.M/°C MAX FROM -55°C TO 150°C.

      (4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ±5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

      (5) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE LETTER G INDICATING PLUS OR MINUS 2 PERCENT RESISTANCE TOLERANCE.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	85
18		14	38	62	86
20		15	39	63	87
22		16	40	64	88
24		17	41	65	89
27		18	42	66	90
30		19	43	67	91
33		20	44	68	92
36		21	45	69	93
39		22	46	70	94
43		23	47	71	95
47		24	48	72	96
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

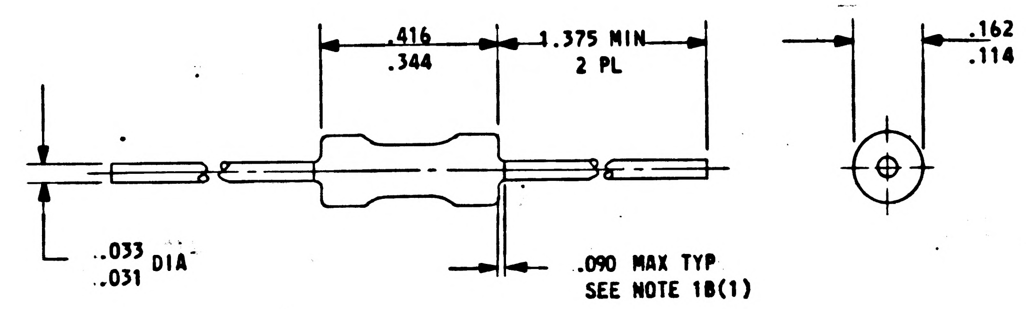
C. ADDITIONS:

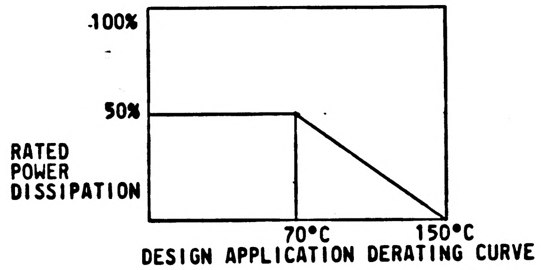
   (1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

   (2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

      A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ±2 SIGMA.
      B) ANY PART WHICH CHANGES MORE THAN 0.75%.
      C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.





DESIGN APPLICATION DERATING CURVE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Mahoney DATE 1-17-63
CHECKED 17 Jan 63
APPROVAL 1-18-63
APPROVAL

NASA APPROVAL W J R 1-23-63

MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED METAL FILM
1/2 WATT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006760

SCALE 4/1 WT SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006760 D

SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00288 UPGRADED TO CLASS A RELEASE	1.18.63		—
B	REVISED PER TDRR 00435	2-20-63	4/3	WK
C	REVISED PER TDRR 00733	4/3/63		WK
D	CHANGE PER TDRR 02593	8/14/63		WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED. ENCAPSULATING MATERIAL MAY COVER LEADS ONLY TO EXTENT SHOWN.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:

± 200P.P.M/°C MAX FROM -55°C TO 150°C.

(4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ±5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

(5) MARKING: RESISTOR SHALL BE LEGIBLY AND PERMANENTLY COLOR CODED IN ACCORDANCE WITH MIL-STD-221. TWO PERCENT RESISTANCE TOLERANCE SHALL BE MARKED WITH A RED COLOR BAND. PACKAGE SHALL BE LEGIBLY MARKED PER MIL-STD-129 WITH MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE NASA DRAWING NUMBER AND REVISION LETTER.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
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16		13	37	61	85
18		14	38	62	86
20		15	39	63	87
22		16	40	64	88
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27		18	42	66	90
30		19	43	67	91
33		20	44	68	92
36		21	45	69	93
39		22	46	70	94
43		23	47	71	95
47		24	48	72	96
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034

C. ADDITIONS:

(1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

(2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

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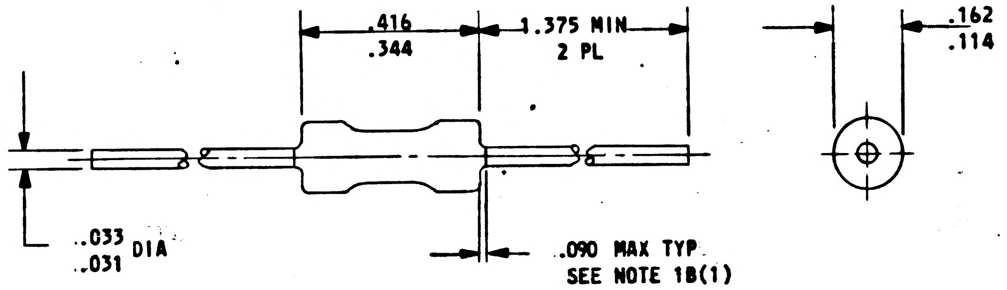
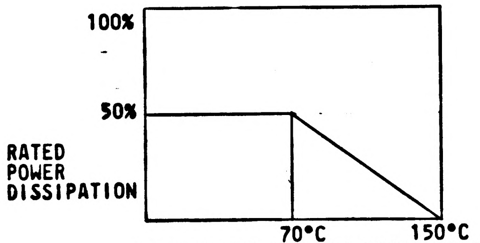
C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.





DESIGN APPLICATION DERATING CURVE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Mahoney DATE 1-17-63
CHECKED 17 Jan 63
APPROVAL 1-18-63
APPROVAL
NASA APPROVAL W J R 1-23-63
MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED METAL FILM
1/2 WATT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006760
SCALE 4/1 WT SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006760 E

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00280 UPGRADED TO CLASS A RELEASE	1-18-63		—
B	REVISED PER TDRR 00435	2-20-63	4/8	WK
C	REVISED PER TDRR 00733	4/3/63		WK
D	CHANGE PER TDRR 02593	8/14/63		WK
E	REVISED PER TDRR 04180	10/30/63		WK

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

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      ± 200P.P.M/°C MAX FROM -55°C TO 150°C.

      (4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ±5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

      (5) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE, LETTER G INDICATING ±2% RESISTANCE TOLERANCE, AND THE MANUFACTURER'S FOUR-DIGIT MANUFACTURING LOT NUMBER.

   C. ADDITIONS:

      (1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

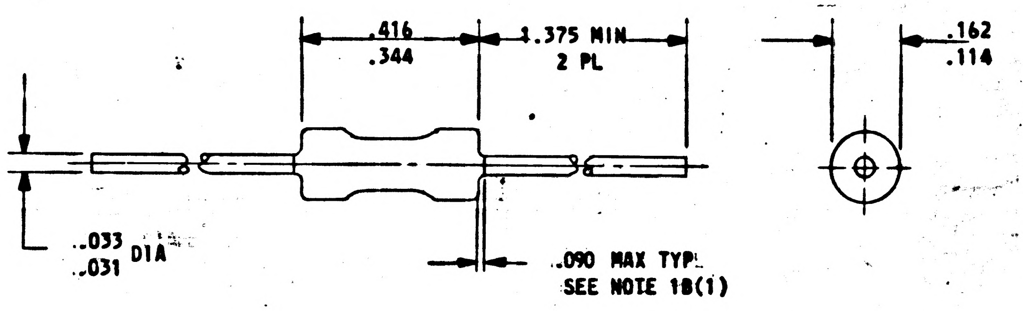
      (2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

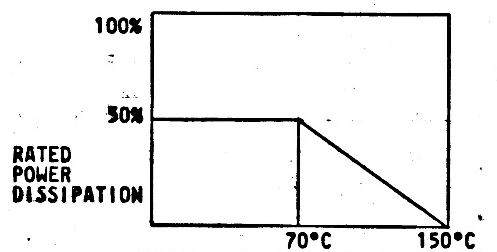
         A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ±2 SIGMA.
         B) ANY PART WHICH CHANGES MORE THAN 0.75%.
         C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

   D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	85
18		14	38	62	86
20		15	39	63	87
22		16	40	64	88
24		17	41	65	89
27		18	42	66	90
30		19	43	67	91
33		20	44	68	92
36		21	45	69	93
39		22	46	70	94
43		23	47	71	95
47		24	48	72	96
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034





DESIGN APPLICATION DERATING CURVE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED 17 Jan 63
APPROVAL 1-18-63
APPROVAL
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED METAL FILM
1/2 WATT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006760
SCALE 4/1 WT SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REVISED & REDRAWN PER TDRR 00288 UPGRADED TO CLASS A RELEASE	1-18-63		—
B	REVISED PER TDRR 00435	2-20-63	4/8	WK
C	REVISED PER TDRR 00733	4/3/63		WK
D	CHANGE PER TDRR 02593	8/14/63		WK
E	REVISED PER TDRR 04180	10/30/63		WK
F	REVISED PER TDRR 06247	2-18-64	WK	

NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE NICKEL LEADS PER PS 1015400. LEADS SHALL ALSO GOLD FLASHED PER PS 1015400 UNLESS OTHERWISE SPECIFIED. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED. ENCAPSULATING MATERIAL MAY COVER LEADS ONLY TO EXTENT SHOWN.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:

± 200P.P.M/°C MAX FROM -55°C TO 150°C.

(4) UNITS SHALL BE CAPABLE OF MEETING AN END OF LIFE TOLERANCE OF ±5% OF NOMINAL VALUE SPECIFIED AFTER 5000 HOURS WHEN ENERGIZED AS SHOWN IN DESIGN APPLICATION DERATING CURVE BELOW.

(5) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER NR 1002019 WITH THE MANUFACTURER'S SYMBOL, TYPE DESIGNATION, NUMERICAL RESISTANCE, VALUE AND TOLERANCE, LETTER G INDICATING ±2% RESISTANCE TOLERANCE, AND THE MANUFACTURER'S FOUR-DIGIT MANUFACTURING LOT NUMBER.

C. ADDITIONS:

(1) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT ND1015404 CLASS I.

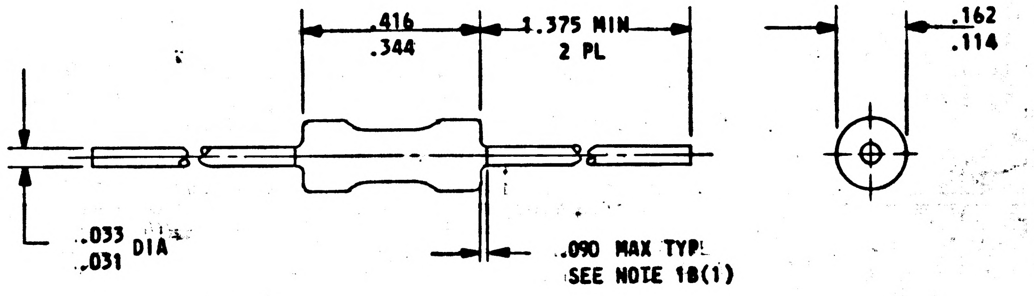
(2) BURN IN: 24 HOURS AT 150% OF RATED LOAD AT ROOM AMBIENT TEMPERATURE. THE FOLLOWING PARTS SHALL NOT BE SHIPPED:

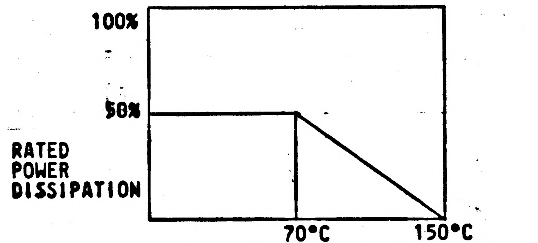
A) ANY PART WHICH CHANGES MORE THAN THE MEAN CHANGE ±2 SIGMA.
B) ANY PART WHICH CHANGES MORE THAN 0.75%.
C) ANY PART WHICH IS BEYOND PURCHASE TOLERANCE AT THE CONCLUSION OF THE TEST.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

BASIC RESISTANCE VALUE OHMS	MULTIPLIER				
	1	10	10^2	10^3	10^4
	DASH NUMBER				
10		8	32	56	80
11		9	33	57	81
12		10	34	58	82
13		11	35	59	83
15		12	36	60	84
16		13	37	61	85
18		14	38	62	86
20		15	39	63	87
22		16	40	64	88
24		17	41	65	89
27		18	42	66	90
30		19	43	67	91
33		20	44	68	92
36		21	45	69	93
39		22	46	70	94
43		23	47	71	95
47		24	48	72	96
51	1	25	49	73	
56	2	26	50	74	
62	3	27	51	75	
68	4	28	52	76	
75	5	29	53	77	
82	6	30	54	78	
91	7	31	55	79	

PURCHASE TO QUALIFICATION STATUS LIST
ND1002034





DESIGN APPLICATION DERATING CURVE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

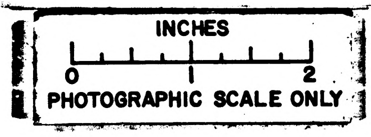
MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Mahoney DATE 1-17-63
CHECKED 11 Jan 63
APPROVAL 1-18-63
APPROVAL
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED METAL FILM
1/2 WATT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006760
SCALE 4/1 WT SHEET 1 OF 1

MASTER



1006760

SYM	REVISIONS DESCRIPTION	DATE	APPROVAL
—	TAKEN FROM BUWEPS DWG 2412016	—	—

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:

A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-22684 FOR TYPE RL 20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

B. EXCEPTIONS:

(1) UNITS SHALL HAVE WELDABLE GOLD COATED DUMET LEADS PER NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL AND FINISH SHALL ACCOMPANY EACH LOT SHIPPED.

(2) INITIAL RESISTANCE SHALL BE PLUS OR MINUS 2% OF THE SPECIFIED VALUE.

(3) TEMPERATURE COEFFECIENT:
± 250P.P.M/°C MAX FROM -55°C TO 150°C.

(4) END OF LIFE TOLERANCE SHALL BE ± 4% OF NOMINAL VALUE SPECIFIED.

C. ADDITIONS:

(1) UNITS SHALL BE CAPABLE OF MEETING THE ENVIRONMENTAL REQUIREMENTS OF NASA DOCUMENT 1002000.

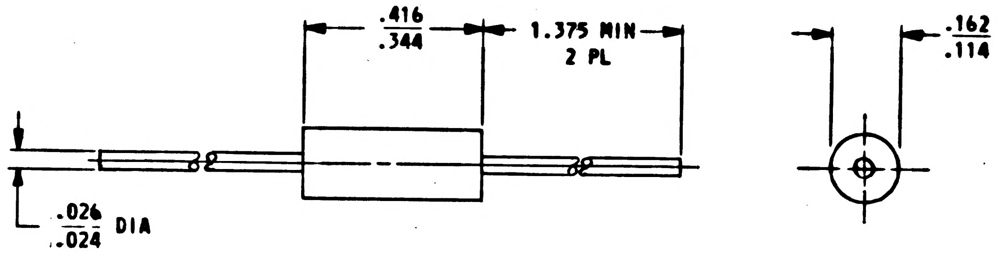
(2) THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA DOCUMENT 1015404 SECTION I.

D. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 **DATE** 11-21-62

BASIC RESISTANCE VALUE OHMS	MULTIPLIER						
	1	10	10^2	10^3	10^4	10^5	10^6
	DASH NUMBER						
10		8	32	56	80		
11		9	33	57	81		
12		10	34	58	82		
13		11	35	59	83		
15		12	36	60	84		
16		13	37	61	85		
18		14	38	62	86		
20		15	39	63	87		
22		16	40	64	88		
24		17	41	65	89		
27		18	42	66	90		
30		19	43	67	91		
33		20	44	68	92		
36		21	45	69	93		
39		22	46	70	94		
43		23	47	71	95		
47		24	48	72	96		
51	1	25	49	73			
56	2	26	50	74			
62	3	27	51	75			
68	4	28	52	76			
75	5	29	53	77			
82	6	30	54	78			
91	7	31	55	79			



ORIGINAL SOURCE OF SUPPLY:

CORNING GLASS WORKS
BRADFORD, PENNSYLVANIA
CODE IDENT NO. 07115
TYPE: C20

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NEXT ASSY	USED ON
APPLICATION	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 10-18-62
CHECKED H. Maynard 25 OCT 62
APPROVAL Ellen C Hall 21 Nov 62
APPROVAL
NASA APPROVAL
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTORS, FIXED METAL FILM
1/2 WATT, 2%
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006760
SCALE 4/1
WT
SHEET 1 OF 1

1006760

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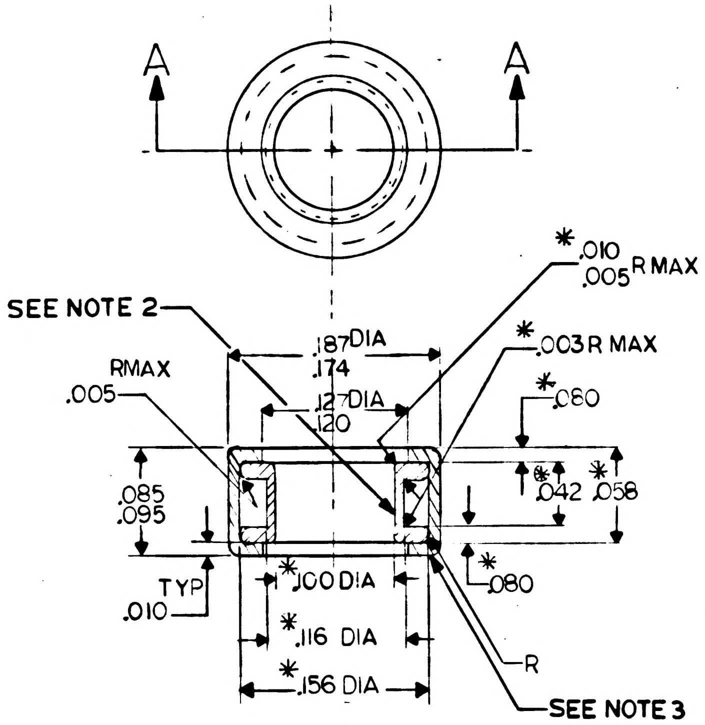
1006761 (M)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 4 PER TDRR 00433	2-20-63	WB WR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-4-62

REFERENCE:
1. ✱ DENOTES SPOOL DIMENSIONS



NOTES:

1. FOR TEST SPECS SEE NASA DOCUMENTS ND 1002008
2. MATERIAL: 303 SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. MATERIAL: NYLON PER MIL-P-20693 TYPE IV
4. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC & PHYSICAL DIMENSIONS.

   B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO: & SPECIFICATIONS. REFERENCE ND 1002034:

   C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

NOMINAL CORE CHARACTERISTICS

RAMP SLOPE	T_P U SEC	T_S U SEC	V_1 MV	V_O MV
200 MA U SEC	1.4	1.9	50	—
400 MA U SEC	0.9	1.3	75	—
1000 MA U SEC	—	—	—	7.0

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —//—
HEAT TREATMENT —//—
FINAL FINISH —//—

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN TROY DATE 8-4-62
CHECKED Lord Shasky 10-8-62
APPROVAL D Duggan
APPROVAL Ellen C Hall
NASA APPROVAL W.J. Rhine 10-4-62
MIT APPROVAL W.A. Kupfer 10/4/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, 5 MAXWELL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006761
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006761

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 4 PER TDRR 00433	2-20-63	WB WR
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WR

FOR INFORMATION ONLY

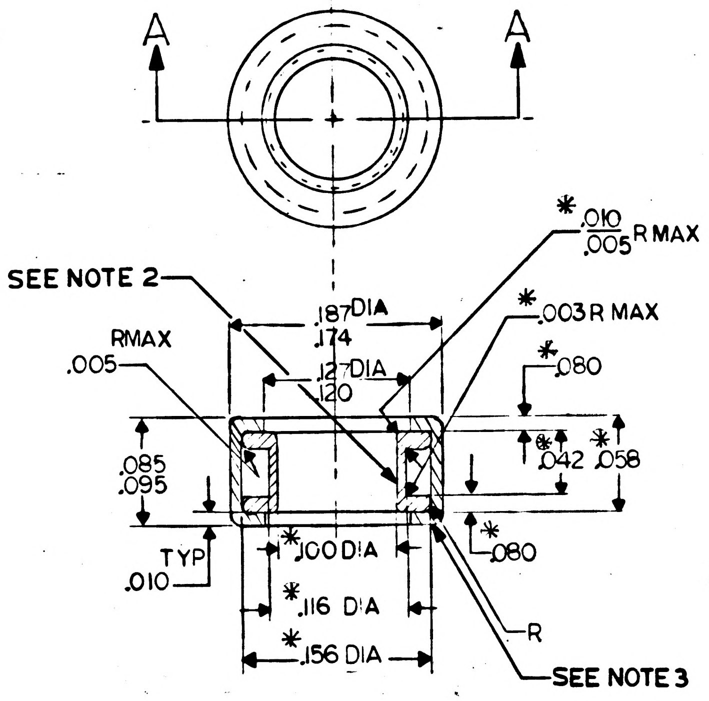
CLASS B RELEASE TDR No. 00050 **DATE** 10-4-62

REFERENCE:
1. ✱DENOTES SPOOL DIMENSIONS

NOTES:
1. FOR TEST SPECS SEE NASA DOCUMENTS ND 1002008
2. MATERIAL: 303SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. MATERIAL: NYLON PER MIL-P-20693 TYPE IV
4. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC & PHYSICAL DIMENSIONS.
   B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO: & SPECIFICATIONS. REFERENCE ND 1002034:
   C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

NOMINAL CORE CHARACTERISTICS

RAMP SLOPE	T_P U SEC	T_S U SEC	V_1 MV	V_O MV
200 MA / U SEC	1.4	1.9	50	—
400 MA / U SEC	0.9	1.3	75	—
1000 MA / U SEC	—	—	—	7.0



Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —//—
HEAT TREATMENT —//—
FINAL FINISH —//—

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN TROY DATE 8-4-62
CHECKED Lord Shanky 10-8-62
APPROVAL D Duggan
APPROVAL Ellen C Hall
NASA APPROVAL W J Rhine 10-4-62
MIT APPROVAL W A Kupfer 10/4/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, 5 MAXWELL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006761
SCALE NONE | WT | SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006761

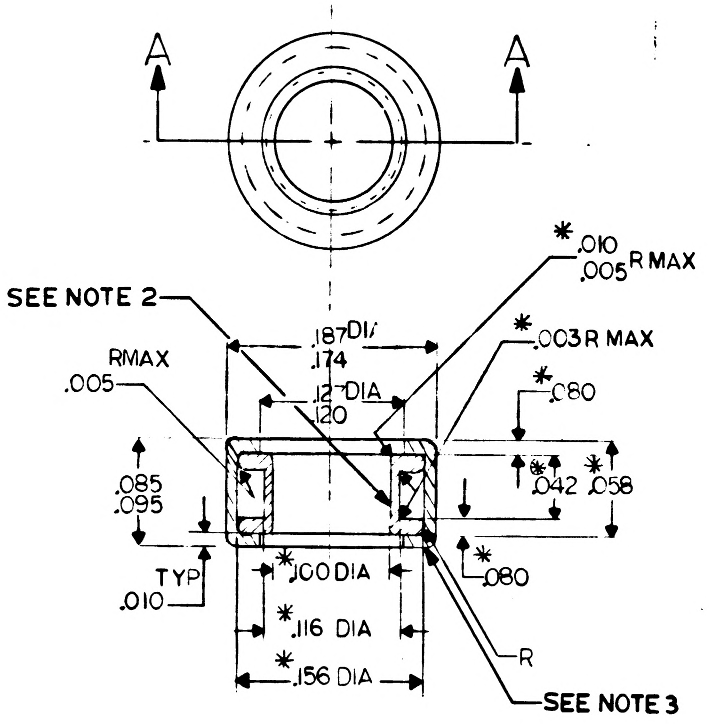
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-11-62

REFERENCE:
1. *DENOTES SPOOL DIMENSIONS

NOTES:
1. FOR TEST SPECS SEE NASA DOCUMENTS ND 1002008
2. MATERIAL: 303SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. MATERIAL: NYLON PER MIL-P-20693 TYPE IV



NOMINAL CORE CHARACTERISTICS

RAMP SLOPE	T_P U SEC	T_S U SEC	V_1 MV	V_O MV
200 MA / U SEC	1.4	1.9	50	—
400 MA / U SEC	0.9	1.3	75	—
1000 MA / U SEC	—	—	—	7.0

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL //
HEAT TREATMENT //
FINAL FINISH //

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN TROY DATE 8-4-62
CHECKED Lord Shimsky 10-8-62
APPROVAL D. Duggan
APPROVAL Eldon C. Hall
NASA APPROVAL W. J. Rhine 10-4-62
MIT APPROVAL W. Kupfer 10/4/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, 5 MAXWELL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006761
SCALE NONE WT SHEET 1 OF 1

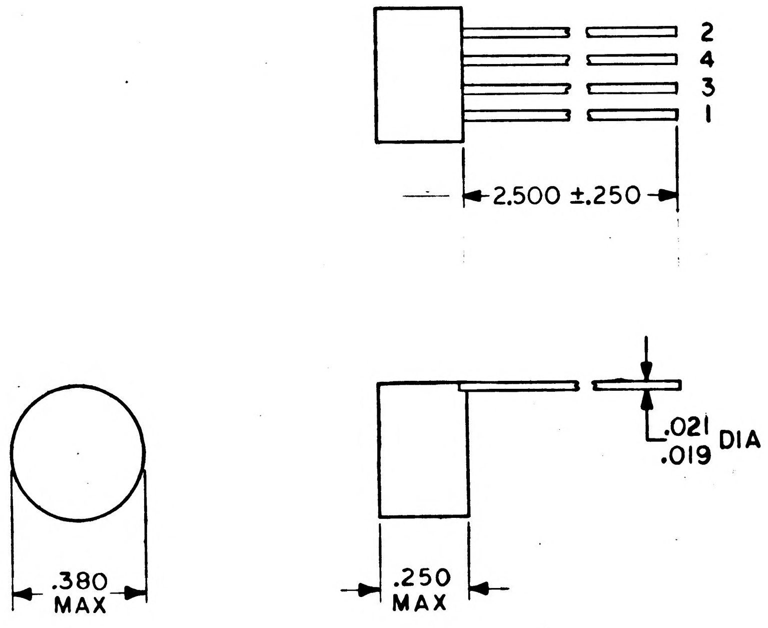
1006761

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00397 UPGRADED TO A RELEASE	2-6-63	

NOTES:

1. REQUIREMENTS:
   - A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - B. EXCEPTIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404 CLASS 1.
     - (2) LEADS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE NASA NUMBER, REVISION LETTER, MANUFACTURER'S NAME OR SYMBOL, PART NUMBER AND LEAD DESIGNATIONS.
   - C. ADDITIONS:
     - (1) INDUCTANCE: 4 MILLIHENRIES PLUS OR MINUS 20 PERCENT MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.
     - (2) LEAKAGE INDUCTANCE: 6 MICROHENRIES MAXIMUM MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 SHORT CIRCUITED.
     - (3) COUPLING CAPACITANCE: 20 MICROMICROFARADS MAXIMUM MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.
     - (4) INPUT CAPACITANCE: 22 MICROMICROFARADS MAXIMUM MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.
     - (5) POWER RATING: 0.3 WATT AT 25 DEGREES CENTIGRADE DERATED LINEARLY TO ZERO AT 105 DEGREES CENTIGRADE.
     - (6) DC RESISTANCE:
       - (a) TERMINALS 1-2: 10 OHMS MAXIMUM
       - (b) TERMINALS 3-4: 20 OHMS MAXIMUM
     - (7) TURNS RATIO: 1 TO 2
     - (8) PULSE DURATION: THE OUTPUT PULSE DURATION AT HALF AMPLITUDE LEVEL SHALL BE 15 MICROSECONDS MINIMUM WITH A LOAD OF 510 OHMS AND 3 MICROSECONDS MAXIMUM WITH A LOAD OF 10K. THE INPUT VOLTAGE SOURCE SHALL BE A SQUARE WAVE GENERATOR HAVING AN INTERNAL IMPEDANCE OF 600 OHMS NOMINAL, A REPETITION RATE OF 1KC PLUS OR MINUS 10 PERCENT, A RISE TIME OF 0.5 MICROSECOND MAXIMUM AND A VOLTAGE OF 40 VOLTS PEAK TO PEAK. THE CIRCUIT PER FIGURE 1 SHALL APPLY.
     - (9) DIELECTRIC WITHSTANDING VOLTAGE AT REDUCED BAROMETRIC PRESSURE LISTED IN GROUP A ACCEPTANCE INSPECTION: TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.
     - (10) UNITS SHALL BE ENCAPSULATED.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



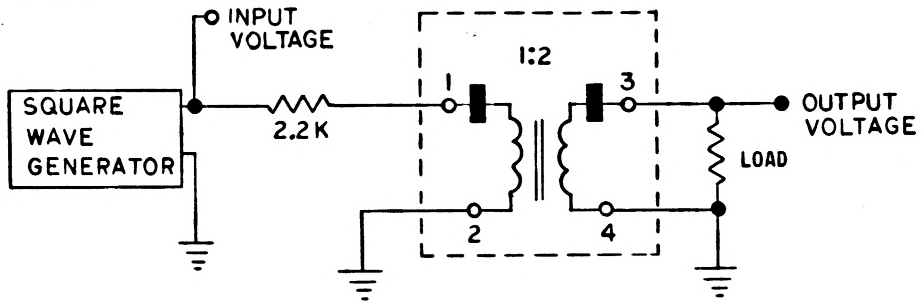
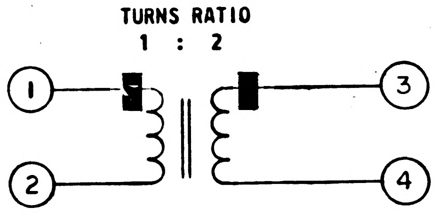


FIGURE I



MASTER

PURCHASE TO QUALIFICATION STATUS LIST ND1002034

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
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DWG. NO. CONTRACT
DRAWN J. Falzone DATE 11-1-62
CHECKED A. Maynard 1 NOV '62
APPROVAL 7 Nov. '62
APPROVAL
NASA APPROVAL 11-8-62
MIT APPROVAL 11/8/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, PULSE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006762
SCALE — | WT — | SHEET 1 OF 1

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1006762 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00397 UPGRADED TO A RELEASE	2-6-63	WK
B	REPLACED BY REV C WITH CHANGES PER TDRR 01558	12 June 64	RKB

NOTES:

1. REQUIREMENTS:
   - A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - B. EXCEPTIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404 CLASS 1.
     - (2) LEADS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE NASA NUMBER, REVISION LETTER, MANUFACTURER'S NAME OR SYMBOL, PART NUMBER AND LEAD DESIGNATIONS.
   - C. ADDITIONS:
     - (1) INDUCTANCE: 4 MILLIHENRIES PLUS OR MINUS 20 PERCENT MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.
     - (2) LEAKAGE INDUCTANCE: 6 MICROHENRIES MAXIMUM MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 SHORT CIRCUITED.
     - (3) COUPLING CAPACITANCE: 20 MICROMICROFARADS MAXIMUM MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.
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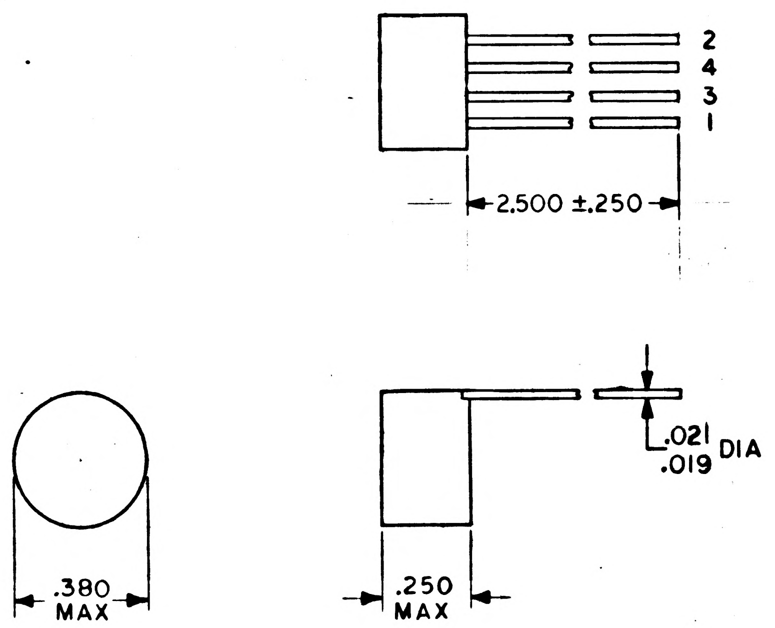
     - (10) UNITS SHALL BE ENCAPSULATED.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



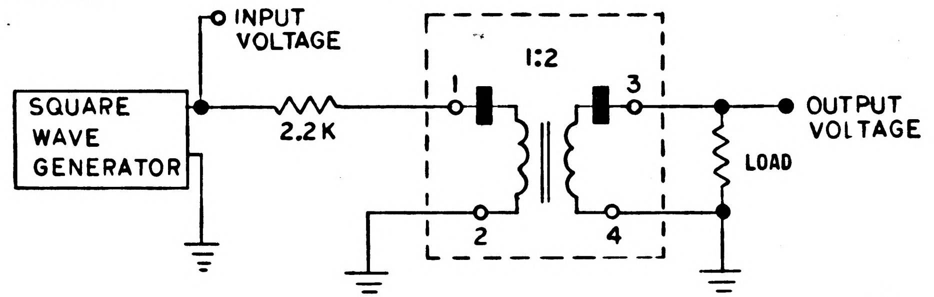
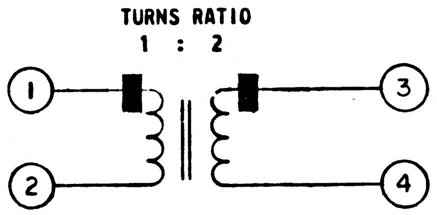


FIGURE 1



Ⓑ REPLACED BY REV C WITH CHANGES

MASTER

~~PURCHASE TO QUALIFICATION~~ STATUS LIST ND1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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APPLICATION	

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ANGLES ± —
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CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN J. Falzano DATE 11-1-62
CHECKED A. Maynard 1 NOV '62
APPROVAL G. Mayo 7 Nov. '62
APPROVAL
NASA APPROVAL W J Rhine 11-8-62
MIT APPROVAL 11/8/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, PULSE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006762
SCALE —
WT —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006762 C

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			
C	REPLACES REV B WITH CHANGE PER TDRR 01558	12 June 63	BJSB

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.

D. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE: (100% UNLESS OTHERWISE SPECIFIED)

A. MECHANICAL REQUIREMENTS:

(1) LEADS SHALL BE IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, LEAD IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

B. ELECTRICAL REQUIREMENTS: APPLICABLE PARAMETERS SHALL BE MEASURED USING A BOONTON 260A Q-METER OR EQUIVALENT.

(1) PRIMARY INDUCTANCE (L_P): 3 MH ± 20%, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.

(2) LEAKAGE INDUCTANCE (L_L) 5 UH MAXIMUM, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 SHORT CIRCUITED.

(3) COUPLING CAPACITANCE (C_C): 50 UUF MAXIMUM, MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.

(4) INPUT CAPACITANCE (C_i): 30 UUF MAXIMUM MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.

(5) WORKING VOLTAGE: 50 VOLTS MINIMUM AT 105°C.

(6) DC RESISTANCE:
   (a) TERMINALS 1-2: 4 OHMS MAXIMUM.
   (b) TERMINALS 3-4: 7 OHMS MAXIMUM.

(7) TURNS RATIO: 1 TO 2.

(8) WAVEFORM: FIGURE 1 WILL REPLACE THE TEST CIRCUIT, FIGURE 4 OF MIL-T-21038B. THE INPUT PULSE TRAIN SHALL HAVE A PULSE REPETITION RATE OF 100K CPS ± 10% AND THE PULSE WIDTH SHALL BE 3.0 MICROSECONDS MINIMUM. PULSE DEFINITION AND MEASUREMENTS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.12 AND 4.8.8 RESPECTIVELY OF MIL-T-21038B. THE TRANSFORMER OUTPUT SHALL MEET THE FOLLOWING SPECIFICATIONS MEASURED AT STANDARD CONDITIONS EXCEPT AS OTHERWISE SPECIFIED: THIS TEST SHALL BE PERFORMED ON A 5% SAMPLE OF EACH SHIPMENT WITH NO FAILURES ALLOWED.

   (a) PULSE DURATION: 3 MICROSECONDS MINIMUM.
   (b) PEAK PULSE AMPLITUDE: 6.0 VOLTS MINIMUM.
   (c) DROOP: 15% MAX MEASURED AT 3 MICROSECONDS
   15% MAX MEASURED AT 2 MICROSECONDS, 105°C
   (d) PULSE RISE TIME: 0.1 MICROSECOND MAXIMUM.
   (e) PULSE DELAY TIME: 0.1 MICROSECOND MAXIMUM.
   (f) OVERSHOOT N/A
   (g) BACKSWING: 40% MAXIMUM

(9) DIELECTRIC WITHSTANDING VOLTAGE AT ATMOSPHERE PRESSURE (AT 28 TO 32 INCHES OF MERCURY): IN ACCORDANCE WITH PARAGRAPH 4.8.4.1 OF MIL-T-21038B. TEST BETWEEN PIN 1 AND PIN 3.

3. DESIGN REQUIREMENTS:

A. POWER RATING: 0.3 WATT AT 25°C DERATED LINEARLY TO .05 WATT AT 105°C.

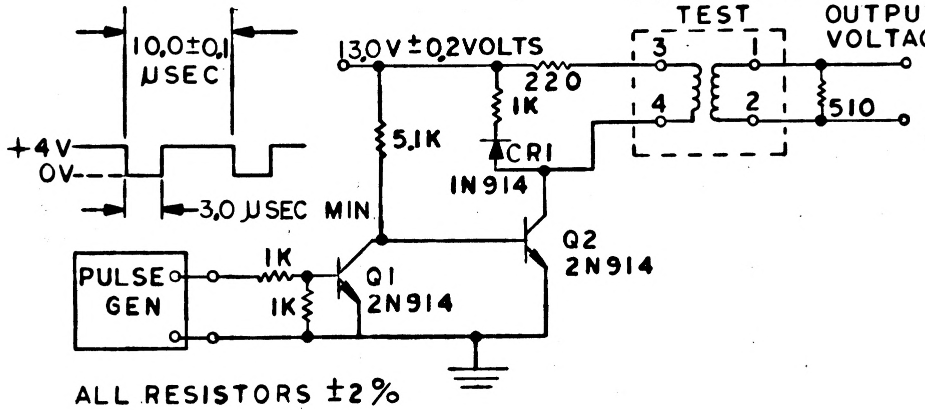
B. DIELECTRIC WITHSTANDING VOLTAGE AT REDUCE BAROMETRIC PRESSURE: IN ACCORDANCE WITH PARAGRAPH 4.8.4.2 OF MIL-T-21038B. TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.

C. UNITS SHALL BE ENCAPSULATED.

D. WIRE SIZE: AWG 41 OR LARGER.

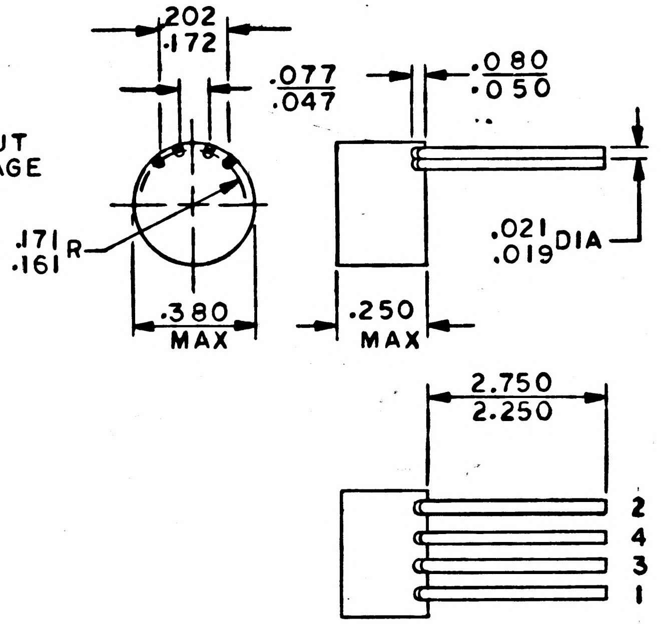
E. OPERATING TEMPERATURE RANGE: 20°C TO 105°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

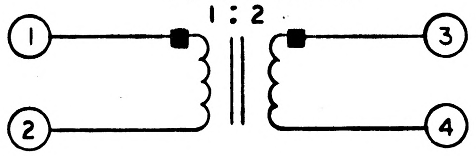


ALL RESISTORS ±2%

FIGURE 1



TURNS RATIO 1:2



Ⓒ REPLACES REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
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CAMBRIDGE, MASS.
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DRAWN C. Crespi DATE 22 May 63
CHECKED J. Ruggeri / H. Maynard 22 May 63
APPROVAL Donald J Bowler 6/11/63
APPROVAL Eldon C Hall 11 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006762
SCALE NONE	WT	SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1006762

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 01558	12 June 63	BJSB
D	REVISED PER TDRR 05628	1/14/64	

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REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.

   D. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE: (100% UNLESS OTHERWISE SPECIFIED)

   A. MECHANICAL REQUIREMENTS:

      (1) LEADS SHALL BE IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (2) MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DASH NO., LEAD IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

   B. ELECTRICAL REQUIREMENTS: APPLICABLE PARAMETERS SHALL BE MEASURED USING A BOONTON 260A Q-METER OR EQUIVALENT.

      (1) PRIMARY INDUCTANCE (L_P): 3 MH ± 20%, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.

      (2) LEAKAGE INDUCTANCE (L_L) 5 UH MAXIMUM, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 SHORT CIRCUITED.

      (3) COUPLING CAPACITANCE (C_C): 50 UUF MAXIMUM, MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.

      (4) INPUT CAPACITANCE (C_i): 30 UUF MAXIMUM MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.

      (5) WORKING VOLTAGE: 50 VOLTS MINIMUM AT 105°C.

      (6) DC RESISTANCE:
         (a) TERMINALS 1-2: 4 OHMS MAXIMUM.
         (b) TERMINALS 3-4: 7 OHMS MAXIMUM.

      (7) TURNS RATIO: 1 TO 2.

      (8) WAVEFORM: FIGURE 1 WILL REPLACE THE TEST CIRCUIT, FIGURE 4 OF MIL-T-21038B. THE INPUT PULSE TRAIN SHALL HAVE A PULSE REPETITION RATE OF 100K CPS ± 10% AND THE PULSE WIDTH SHALL BE 3.0 MICROSECONDS MINIMUM. PULSE DEFINITION AND MEASUREMENTS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.12 AND 4.8.8 RESPECTIVELY OF MIL-T-21038B. THE TRANSFORMER OUTPUT SHALL MEET THE FOLLOWING SPECIFICATIONS MEASURED AT STANDARD CONDITIONS EXCEPT AS OTHERWISE SPECIFIED: THIS TEST SHALL BE PERFORMED ON A 5% SAMPLE OF EACH SHIPMENT WITH NO FAILURES ALLOWED.
         (a) PULSE DURATION: 3 MICROSECONDS MINIMUM.
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         (c) DROOP: 15% MAX MEASURED AT 3 MICROSECONDS, 20°C NOM
             15% MAX MEASURED AT 2 MICROSECONDS, 105°C
         (d) PULSE RISE TIME: 0.1 MICROSECOND MAXIMUM.
         (e) PULSE DECAY TIME: 0.1 MICROSECOND MAXIMUM.
         (f) OVERSHOOT N/A
         (g) BACKSWING: 40% MAXIMUM

      (9) DIELECTRIC WITHSTANDING VOLTAGE AT ATMOSPHERE PRESSURE (AT 28 TO 32 INCHES OF MERCURY): IN ACCORDANCE WITH PARAGRAPH 4.8.4.1 OF MIL-T-21038B. TEST BETWEEN PIN 1 AND PIN 3.

3. DESIGN REQUIREMENTS:

   A. POWER RATING: 0.3 WATT AT 25°C DERATED LINEARLY TO .05 WATT AT 105°C.

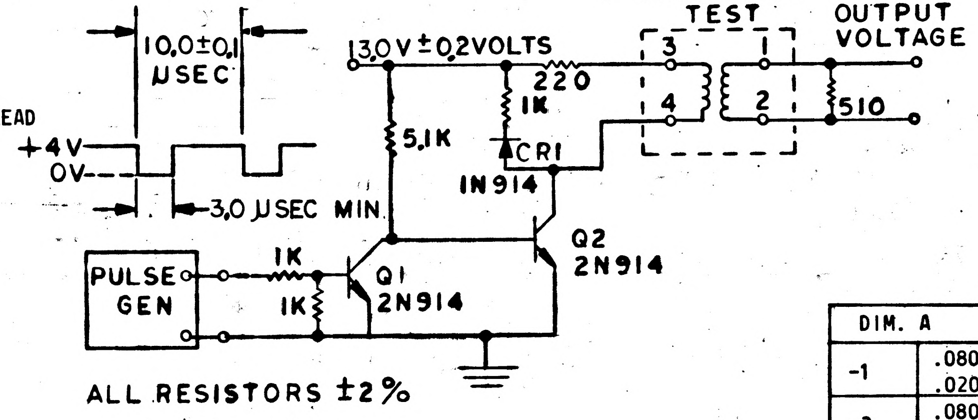
   B. DIELECTRIC WITHSTANDING VOLTAGE AT REDUCE BAROMETRIC PRESSURE: IN ACCORDANCE WITH PARAGRAPH 4.8.4.2 OF MIL-T-21038B. TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.

   C. UNITS SHALL BE ENCAPSULATED.

   D. WIRE SIZE: AWG 41 OR LARGER.

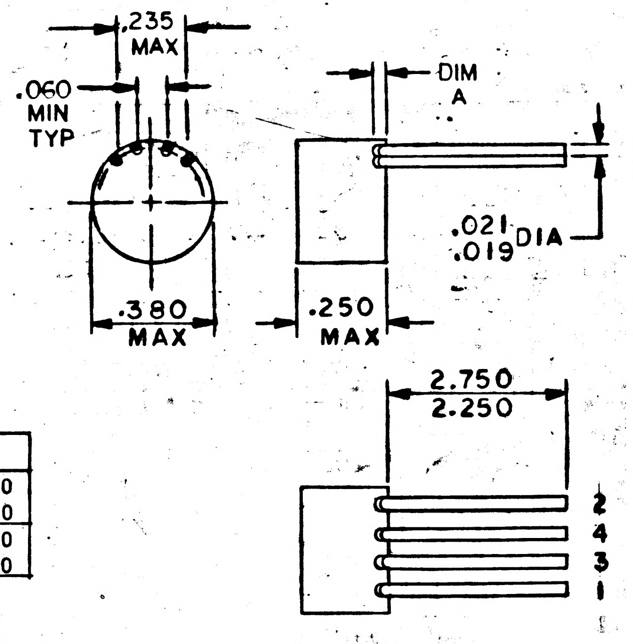
   E. OPERATING TEMPERATURE RANGE: 20°C TO 105°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

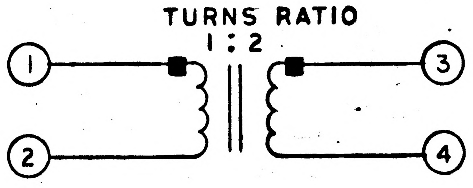


ALL RESISTORS ±2%

FIGURE 1



DIM. A	
-1	.080 .020
-2	.080 .000



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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

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DRAWN C. Crespi DATE 22 May 63
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NASA APPROVAL Jack Bassett
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006762

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E | 1006762

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 01558	12 June 63	BSB
D	REVISED PER TDRR 05628	1/14/64	
E	REVISED PER TDRR 08239	12 May 64	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
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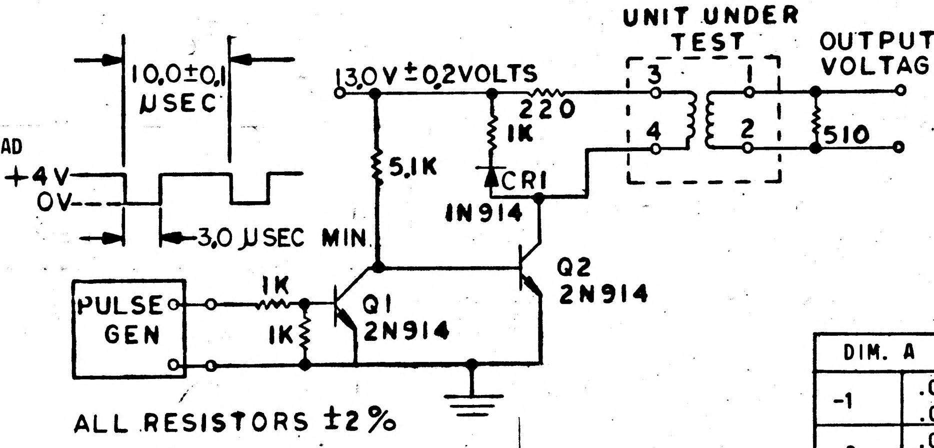
   - D. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
2. INSPECTION AND ACCEPTANCE: (100% UNLESS OTHERWISE SPECIFIED)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEADS SHALL BE IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (2) MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DASH NO., LEAD IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.
   - B. ELECTRICAL REQUIREMENTS: APPLICABLE PARAMETERS SHALL BE MEASURED USING A BOONTON 260A Q-METER OR EQUIVALENT.
     - (1) PRIMARY INDUCTANCE (L_P): 3 MH ± 20%, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.
     - (2) LEAKAGE INDUCTANCE (L_L) 5 UH MAXIMUM, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 SHORT CIRCUITED.
     - (3) COUPLING CAPACITANCE (C_C): 50 UUF MAXIMUM, MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.
     - (4) INPUT CAPACITANCE (C_i): 30 UUF MAXIMUM MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.
     - (5) WORKING VOLTAGE: 50 VOLTS MINIMUM AT 105°C.
     - (6) DC RESISTANCE:
       - (a) TERMINALS 1-2: 4 OHMS MAXIMUM.
       - (b) TERMINALS 3-4: 7 OHMS MAXIMUM.
     - (7) TURNS RATIO: 1 TO 2.
     - (8) WAVEFORM: FIGURE 1 WILL REPLACE THE TEST CIRCUIT, FIGURE 4 OF MIL-T-21038B. THE INPUT PULSE TRAIN SHALL HAVE A PULSE REPETITION RATE OF 100K CPS ± 10% AND THE PULSE WIDTH SHALL BE 3.0 MICROSECONDS MINIMUM. PULSE DEFINITION AND MEASUREMENTS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.12 AND 4.8.8 RESPECTIVELY OF MIL-T-21038B. THE TRANSFORMER OUTPUT SHALL MEET THE FOLLOWING SPECIFICATIONS MEASURED AT STANDARD CONDITIONS EXCEPT AS OTHERWISE SPECIFIED: THIS TEST SHALL BE PERFORMED ON A 5% SAMPLE OF EACH SHIPMENT WITH NO FAILURES ALLOWED.
       - (a) PULSE DURATION: 3 MICROSECONDS MINIMUM.
       - (b) PEAK PULSE AMPLITUDE: 6.0 VOLTS MINIMUM.
       - (c) DROOP: 15% MAX MEASURED AT 3 MICROSECONDS, 20°C NOM
15% MAX MEASURED AT 2 MICROSECONDS, 105°C
       - (d) PULSE RISE TIME: 0.1 MICROSECOND MAXIMUM.
       - (e) PULSE ~~DECAY~~ TIME: 0.1 MICROSECOND MAXIMUM.
       - (f) OVERSHOOT N/A
       - (g) BACKSWING: 40% MAXIMUM
     - (9) DIELECTRIC WITHSTANDING VOLTAGE AT ATMOSPHERE PRESSURE (AT 28 TO 32 INCHES OF MERCURY): IN ACCORDANCE WITH PARAGRAPH 4.8.4.1 OF MIL-T-21038B. TEST BETWEEN PIN 1 AND PIN 3.
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 0.3 WATT AT 25°C DERATED LINEARLY TO .05 WATT AT 105°C.
   - B. DIELECTRIC WITHSTANDING VOLTAGE AT REDUCE BAROMETRIC PRESSURE: IN ACCORDANCE WITH PARAGRAPH 4.8.4.2 OF MIL-T-21038B. TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.
   - C. UNITS SHALL BE ENCAPSULATED.
   - D. WIRE SIZE: AWG 41 OR LARGER.
   - E. OPERATING TEMPERATURE RANGE: 20°C TO 105°C.

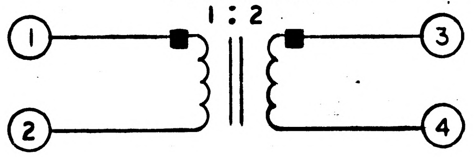
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

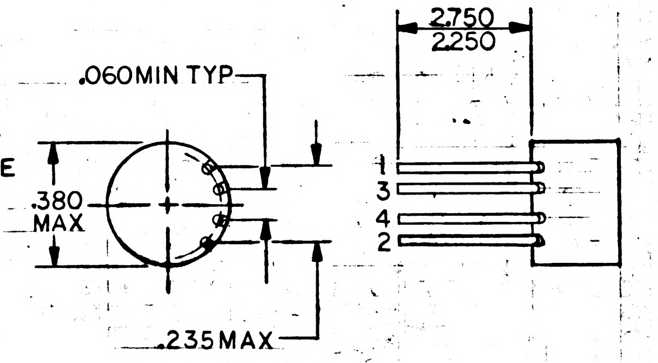


ALL RESISTORS ±2%

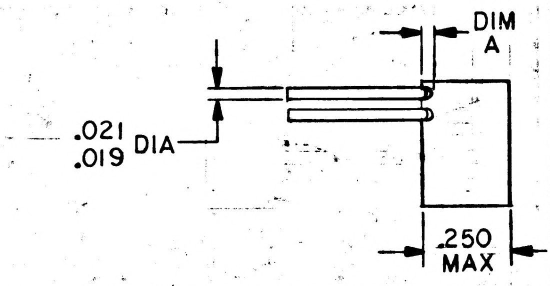
FIGURE 1

TURNS RATIO 1 : 2





DIM. A	
-1	.080 .020
-2	.080 .000



Ⓒ REPLACES REV B WITH CHANGE

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DRAWN C. Crespi DATE 22 May 63
CHECKED J. Ruggeri / H. Maynard 22 MAY 63
APPROVAL Donald J. Bowler 6/11/63
APPROVAL Eldon C Hall 11 June 63
NASA APPROVAL
MIT APPROVAL

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HOUSTON, TEXAS

TRANSFORMER, PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006762
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES
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4 3 2 1

SYM	REVISIONS DESCRIPTION	DATE	APPROVAL

1006762

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NOTES:

1. REQUIREMENTS:
   - A. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - B. EXCEPTIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404 SECTION
     - (2) LEADS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) UNIT MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE NASA NUMBER, REVISION LETTER, MANUFACTURER'S NAME OR SYMBOL, PART NUMBER AND LEAD DESIGNATIONS.
   - C. ADDITIONS:
     - (1) PRIMARY INDUCTANCE: 4 MILLIHENRIES PLUS OR MINUS 20 PERCENT MEASURED AT THE PRIMARY WITH THE SECONDARY WINDING OPEN CIRCUITED.
     - (2) LEAKAGE INDUCTANCE: 4.5 MICROHENRIES MAXIMUM MEASURED AT THE PRIMARY WITH THE SECONDARY WINDING SHORT CIRCUITED.
     - (3) COUPLING CAPACITANCE: 20 MICROMICROFARADS MAXIMUM MEASURED BY SHORTING THE PRIMARY AND SECONDARY WINDINGS AND MEASURING THE CAPACITANCE BETWEEN THEM.
     - (4) INPUT CAPACITANCE: 22 MICROMICROFARADS MAXIMUM MEASURED AT THE PRIMARY.
     - (5) POWER RATING: 0.3 WATT AT 25 DEGREES CENTIGRADE DERATED LINEARLY TO ZERO AT 105 DEGREES CENTIGRADE.
     - (6) DC RESISTANCE:
       - (a) PRIMARY WINDING: 10 OHMS MAXIMUM
       - (b) SECONDARY WINDING: 20 OHMS MAXIMUM
     - (7) TURNS RATIO: 1 TO 2
     - (8) PULSE DURATION: THE OUTPUT PULSE DURATION SHALL BE 15 MICROSECONDS MINIMUM WITH A LOAD OF 510 OHMS AND 3 MICROSECONDS MAXIMUM WITH A LOAD OF 10K. THE INPUT VOLTAGE SOURCE SHALL BE A SQUARE WAVE GENERATOR HAVING AN INTERNAL IMPEDANCE OF 600 OHMS NOMINAL, A REPETITION RATE OF 1KC PLUS OR MINUS 10 PERCENT, A RISE TIME OF 0.5 MICROSECOND MAXIMUM AND A VOLTAGE OF 40 VOLTS PEAK TO PEAK. THE CIRCUIT PER FIGURE 1 SHALL APPLY.
     - (9) DIELECTRIC WITHSTANDING VOLTAGE AT REDUCED BAROMETRIC PRESSURE LISTED IN GROUP A ACCEPTANCE INSPECTION: TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.
     - (10) UNITS SHALL BE ENCAPSULATED.
     - (11) UNITS SHALL BE CAPABLE OF WITHSTANDING THE ENVIRONMENTAL TESTS PER ND
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

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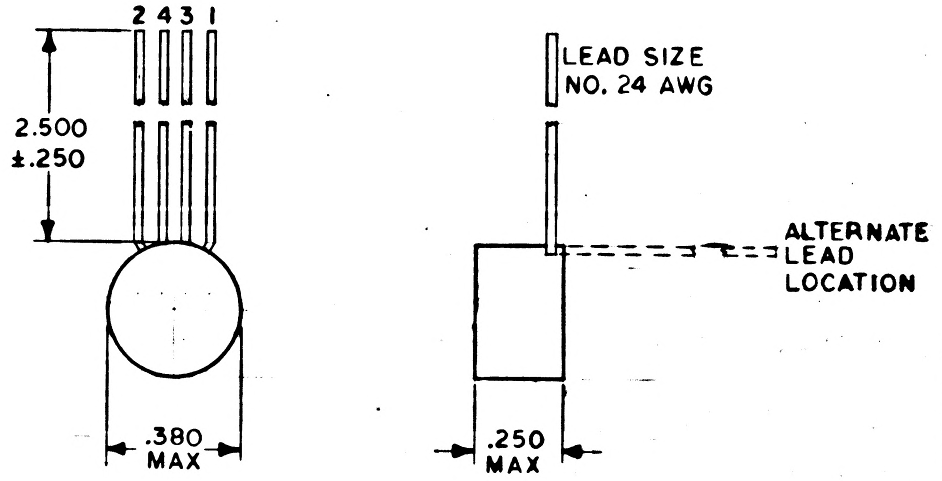


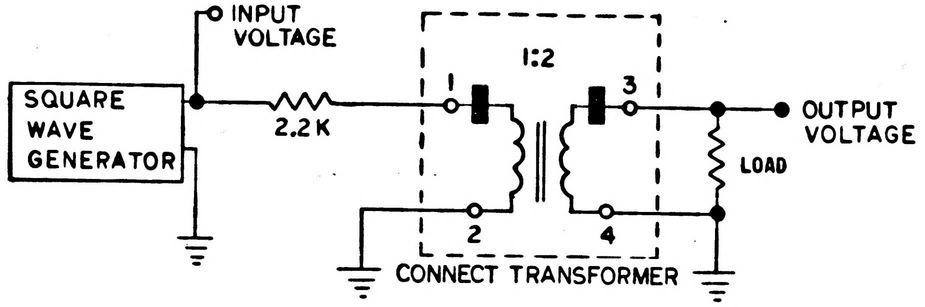
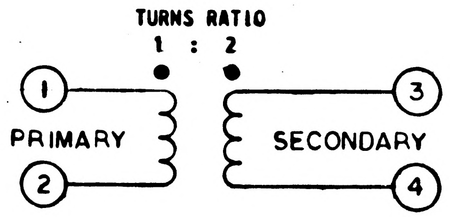


FIGURE I



ORIGINAL SOURCE OF SUPPLY:

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DRAWN J. Falzone DATE 11-1-62
CHECKED H. Maynard 1 NOV '62
APPROVAL 7 Nov. '62
APPROVAL Eldon C Hall 7 Nov '62
NASA APPROVAL 11-8-62
MIT APPROVAL 11/8/62

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HOUSTON, TEXAS

TRANSFORMER, PULSE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006762
SCALE —//— WT —//— SHEET 1 OF 1

4 3 2 1

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1006769 A Ⓜ

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			
A	REVISED PER TDRR 00101	11/21/62	ECN WR

NOTES:

1. REQUIREMENTS:
   - A. THIS DEVICE SHALL MEET THE MATERIAL AND WORKMANSHIP REQUIREMENTS OF MIL-S-19500.
   - B. LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETERS SHALL BE AS FOLLOWS:
     - (1) THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000; IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAX, AND IN ALL OTHER ZONES SHALL BE UNCONTROLLED.
   - C. UNITS SHALL BE HERMETICALLY SEALED IN A METAL CASE.
   - D. UNITS SHALL MEET THE TEST REQUIREMENTS AS SPECIFIED IN ND 1002017.
   - E. QUALITY ASSURANCE PROVISIONS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT ND 1015404 SECTION I.
   - F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-S-19491.
2. EXPLANATORY NOTES FOR SCHEMATIC:
   - A. R* IS THE EMITTER DEGENERATION REQUIRED TO BALANCE THE D.C. COLLECTOR VOLTAGES OF T_1 AND T_2 AND TO GET THE REQUIRED DIFFERENTIAL GAIN.
   - B. V_Y IS ADJUSTABLE TO SET SENSING THRESHOLD. $-6V \leq V_Y \leq -4V$
   - C. AN EXTERNAL RESISTOR MIGHT BE ADDED AT THIS POINT TO MATCH SENSE AMPLIFIERS IF ANALYSIS SHOWS IT TO BE NECESSARY.
   - D. VZ AND ITS ACCOMPANYING 100 Ω RESISTORS MAY NOT BE USED ON SOME SENSE AMPLIFIERS. WHEN THEY ARE SPECIFIED TO BE USED THEY WILL BE CONNECTED AS SHOWN BY THE DOTTED LINES.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

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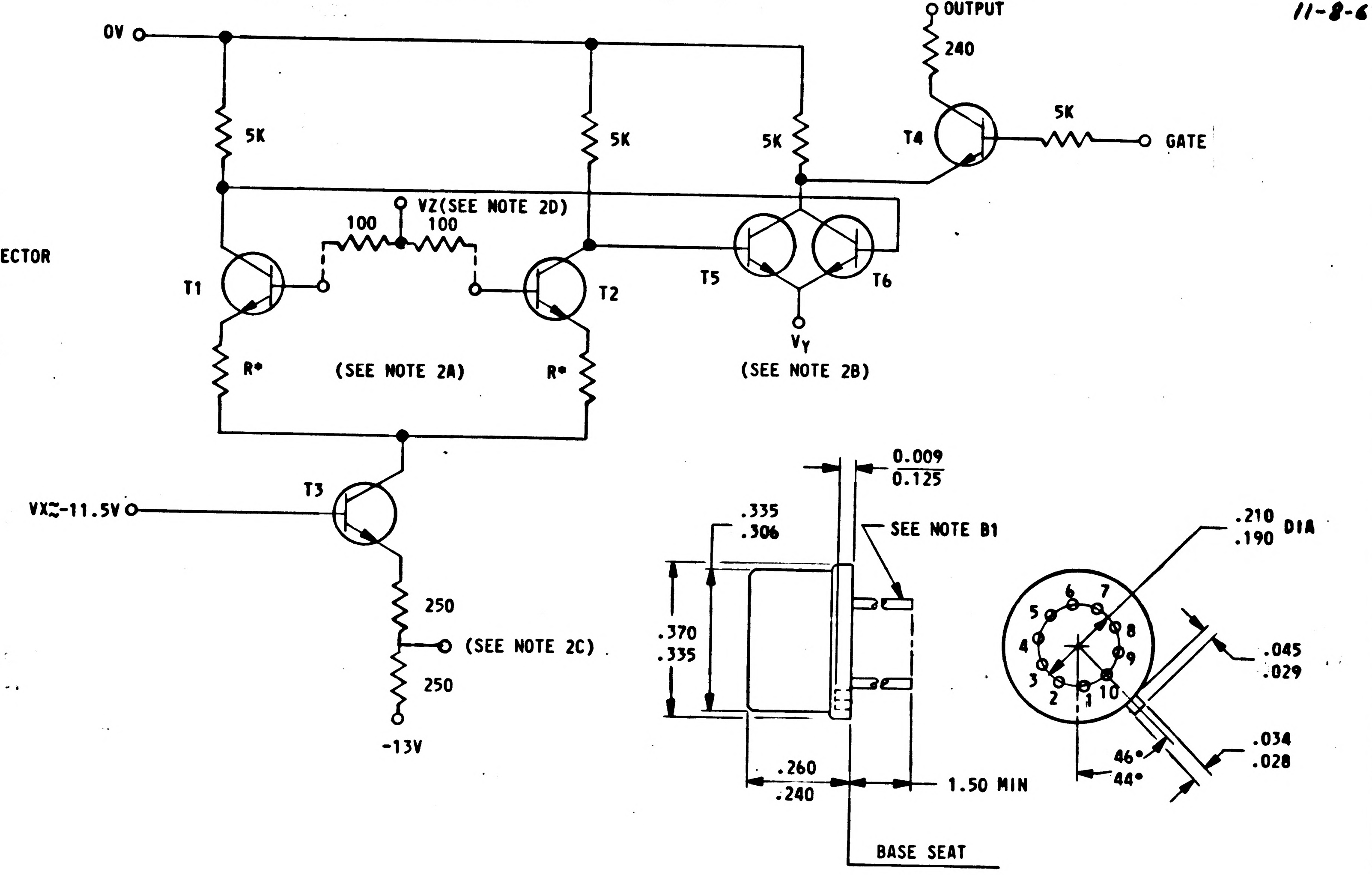
CLASS B RELEASE TDR No. 00085 DATE 11-8-62



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APPROVAL Eldon C Hall 7 Nov '62
NASA APPROVAL W J Rhine 11-8-62
MIT APPROVAL 11/8/62

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SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006769
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WT
SHEET 1 OF 1

1006769 A

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B 1006769 (M)

		REVISIONS		
	SYM	DESCRIPTION	DATE	APPROVAL
(M)	A	REVISED PER TDRR 00101	1/21/62	ECN WR
(M)	B	REVISED PER TDRR 00286	1.23.63	ECN WK.

NOTES:

1. REQUIREMENTS:
   - A. THIS DEVICE SHALL MEET THE MATERIAL AND WORKMANSHIP REQUIREMENTS OF MIL-S-19500.
   - B. LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETERS SHALL BE AS FOLLOWS:
     - (1) THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000; IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAX, AND IN ALL OTHER ZONES SHALL BE UNCONTROLLED.
   - C. UNITS SHALL BE HERMETICALLY SEALED IN A METAL CASE.
   - D. UNITS SHALL MEET THE TEST REQUIREMENTS AS SPECIFIED IN ND 1002017.
   - E. QUALITY ASSURANCE PROVISIONS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT ND 1015404 SECTION I.
   - F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-S-19491.
2. EXPLANATORY NOTES FOR SCHEMATIC:
   - A. R* IS THE EMITTER DEGENERATION REQUIRED TO BALANCE THE D.C. COLLECTOR VOLTAGES OF T_1 AND T_2 AND TO GET THE REQUIRED DIFFERENTIAL GAIN.
   - B. V_Y IS ADJUSTABLE TO SET SENSING THRESHOLD. $-6V \leq V_Y \leq -4V$
   - C. AN EXTERNAL RESISTOR MIGHT BE ADDED AT THIS POINT TO MATCH SENSE AMPLIFIERS IF ANALYSIS SHOWS IT TO BE NECESSARY.
   - D. VZ AND ITS ACCOMPANYING 100 Ω RESISTORS MAY NOT BE USED ON SOME SENSE AMPLIFIERS. WHEN THEY ARE SPECIFIED TO BE USED THEY WILL BE CONNECTED AS SHOWN BY THE DOTTED LINES.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

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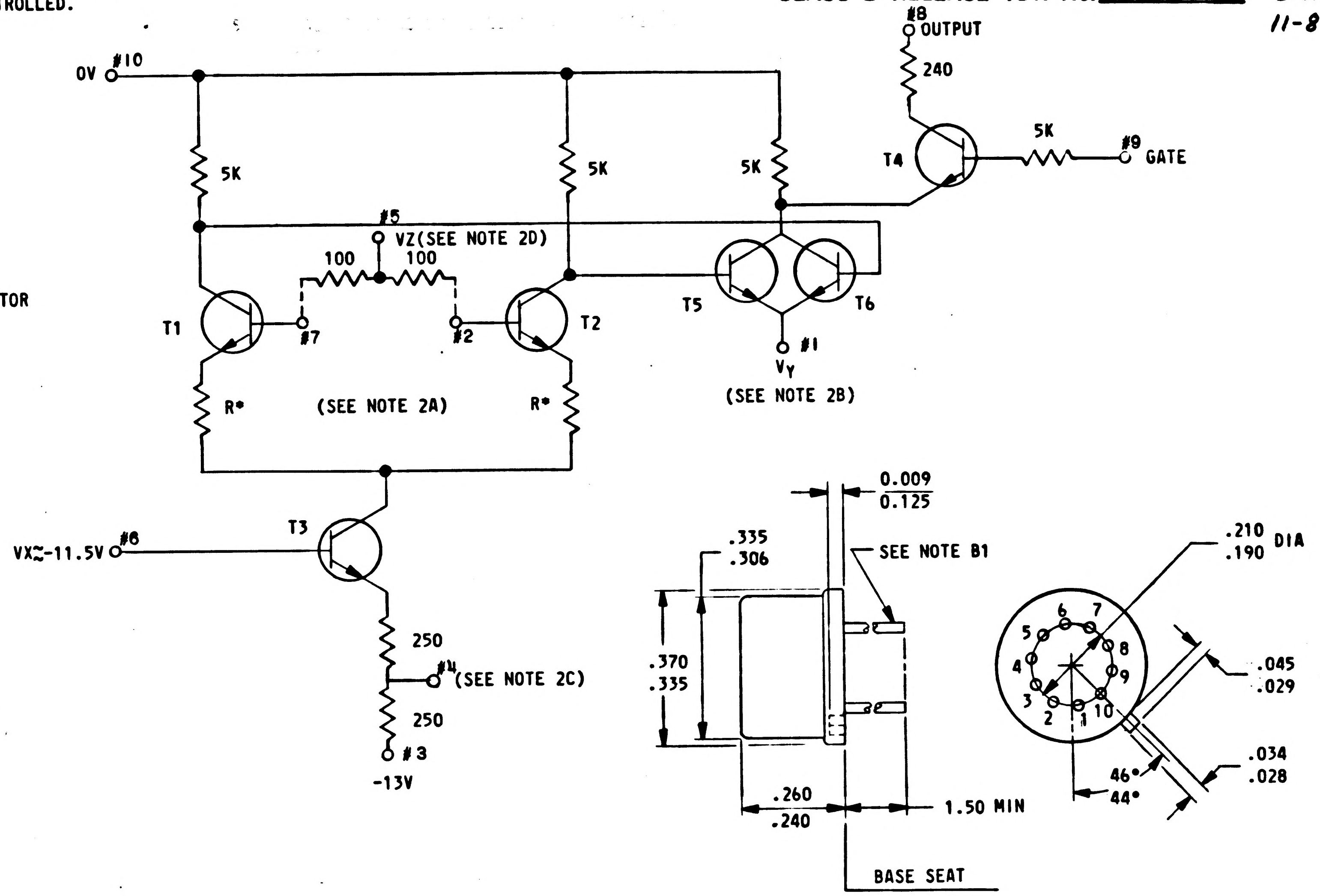

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006769
SCALE NONE	WT	SHEET 1 OF 1

1006769 B

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B 1006769 Ⓜ

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ A	REVISED PER TDRR 00101	11/21/62	ECN WR
Ⓜ B	REVISED PER TDRR 00286	1.23.63	ECN WR.
C	ADDED PROCUREMENT NOTE 4 PER TDRR 00433	2-20-63	WJB WH

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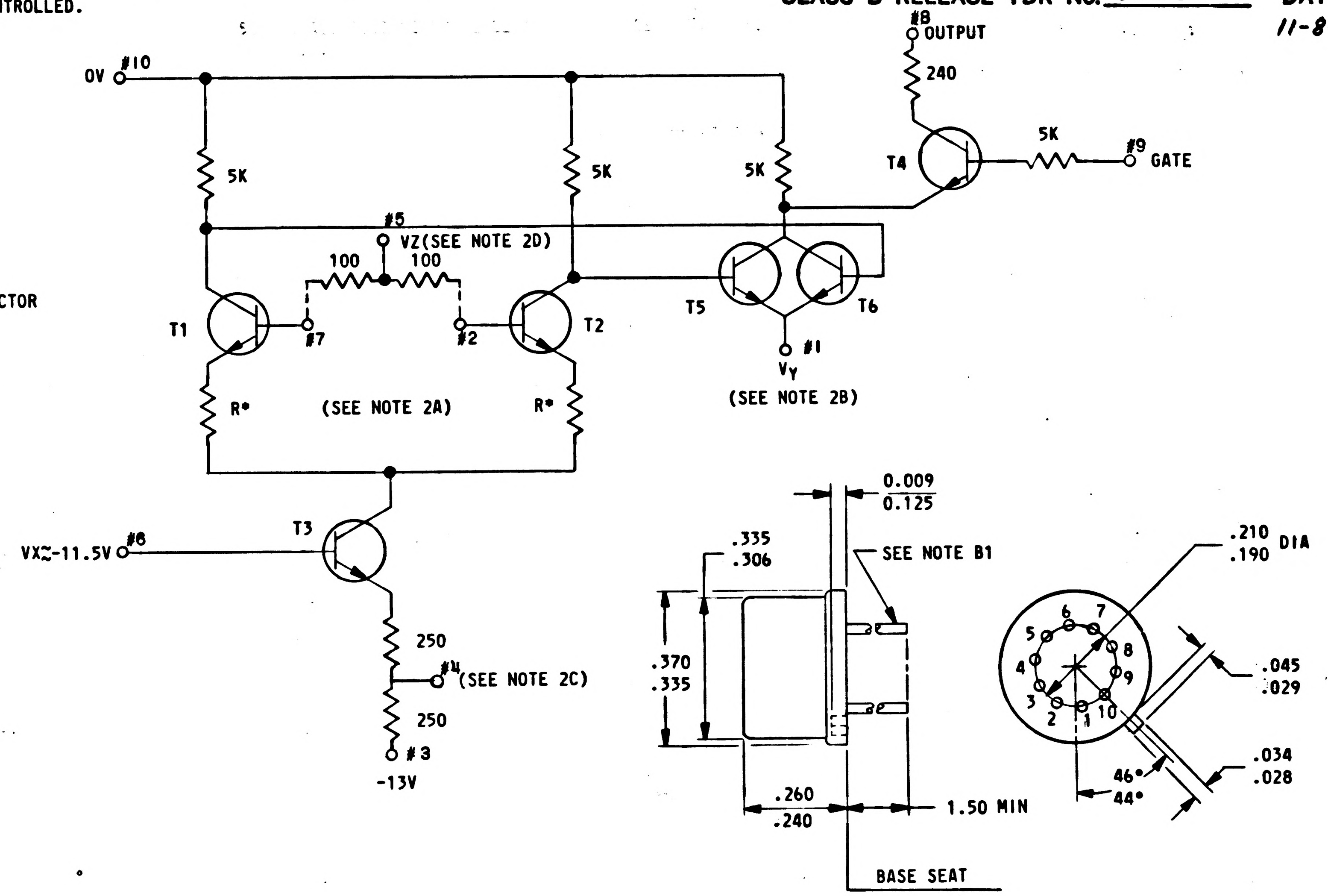
CLASS B RELEASE TDR No. 00085 DATE 11-8-62

NOTES:

1. REQUIREMENTS:
   - A. THIS DEVICE SHALL MEET THE MATERIAL AND WORKMANSHIP REQUIREMENTS OF MIL-S-19500.
   - B. LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETERS SHALL BE AS FOLLOWS:
     - (1) THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000; IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAX, AND IN ALL OTHER ZONES SHALL BE UNCONTROLLED.
   - C. UNITS SHALL BE HERMETICALLY SEALED IN A METAL CASE.
   - D. UNITS SHALL MEET THE TEST REQUIREMENTS AS SPECIFIED IN ND 1002017.
   - E. QUALITY ASSURANCE PROVISIONS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT ND 1015404 SECTION I.
   - F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-S-19491.
2. EXPLANATORY NOTES FOR SCHEMATIC:
   - A. R* IS THE EMITTER DEGENERATION REQUIRED TO BALANCE THE D.C. COLLECTOR VOLTAGES OF T_1 AND T_2 AND TO GET THE REQUIRED DIFFERENTIAL GAIN.
   - B. V_Y IS ADJUSTABLE TO SET SENSING THRESHOLD. $-6V \le V_Y \le -4V$
   - C. AN EXTERNAL RESISTOR MIGHT BE ADDED AT THIS POINT TO MATCH SENSE AMPLIFIERS IF ANALYSIS SHOWS IT TO BE NECESSARY.
   - D. VZ AND ITS ACCOMPANYING 100 Ω RESISTORS MAY NOT BE USED ON SOME SENSE AMPLIFIERS. WHEN THEY ARE SPECIFIED TO BE USED THEY WILL BE CONNECTED AS SHOWN BY THE DOTTED LINES.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
4.
   - A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER C BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER C.



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FRACTIONS ± DECIMALS ± ANGLES ±
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DRAWN Ray W Wheeler DATE 5 Nov 62
CHECKED W. Maynard 6 Nov '62
APPROVAL [illegible] 7 Nov '62
APPROVAL Eldon C Hall 7 Nov '62
NASA APPROVAL [illegible] 11-8-62
MIT APPROVAL [illegible] 11/8/62

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SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006769
SCALE NONE WT SHEET 1 OF 1

D 1006769 (M)

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00101	11/21/62	ECN WK
B	REVISED PER TDRR 00286	1-23-63	ECN WK
C	ADDED PROCUREMENT NOTE 4 PER TDRR 00433	2-20-63	WJR WK
D	REPLACED WITH CHANGE BY REV E PER TDRR 00513		WK

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CLASS B RELEASE TDR No. 00085 DATE 11-8-62

NOTES:

1. REQUIREMENTS:
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   - B. LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETERS SHALL BE AS FOLLOWS:
     - (1) THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000; IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAX, AND IN ALL OTHER ZONES SHALL BE UNCONTROLLED.
   - C. UNITS SHALL BE HERMETICALLY SEALED IN A METAL CASE.
   - D. UNITS SHALL MEET THE TEST REQUIREMENTS AS SPECIFIED IN ND 1002017.
   - E. QUALITY ASSURANCE PROVISIONS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT ND 1015404 SECTION I.
   - F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-S-19491.
2. EXPLANATORY NOTES FOR SCHEMATIC:
   - A. R* IS THE EMITTER DEGENERATION REQUIRED TO BALANCE THE D.C. COLLECTOR VOLTAGES OF T_1 AND T_2 AND TO GET THE REQUIRED DIFFERENTIAL GAIN.
   - B. V_Y IS ADJUSTABLE TO SET SENSING THRESHOLD. $-6V \leq V_Y \leq -4V$
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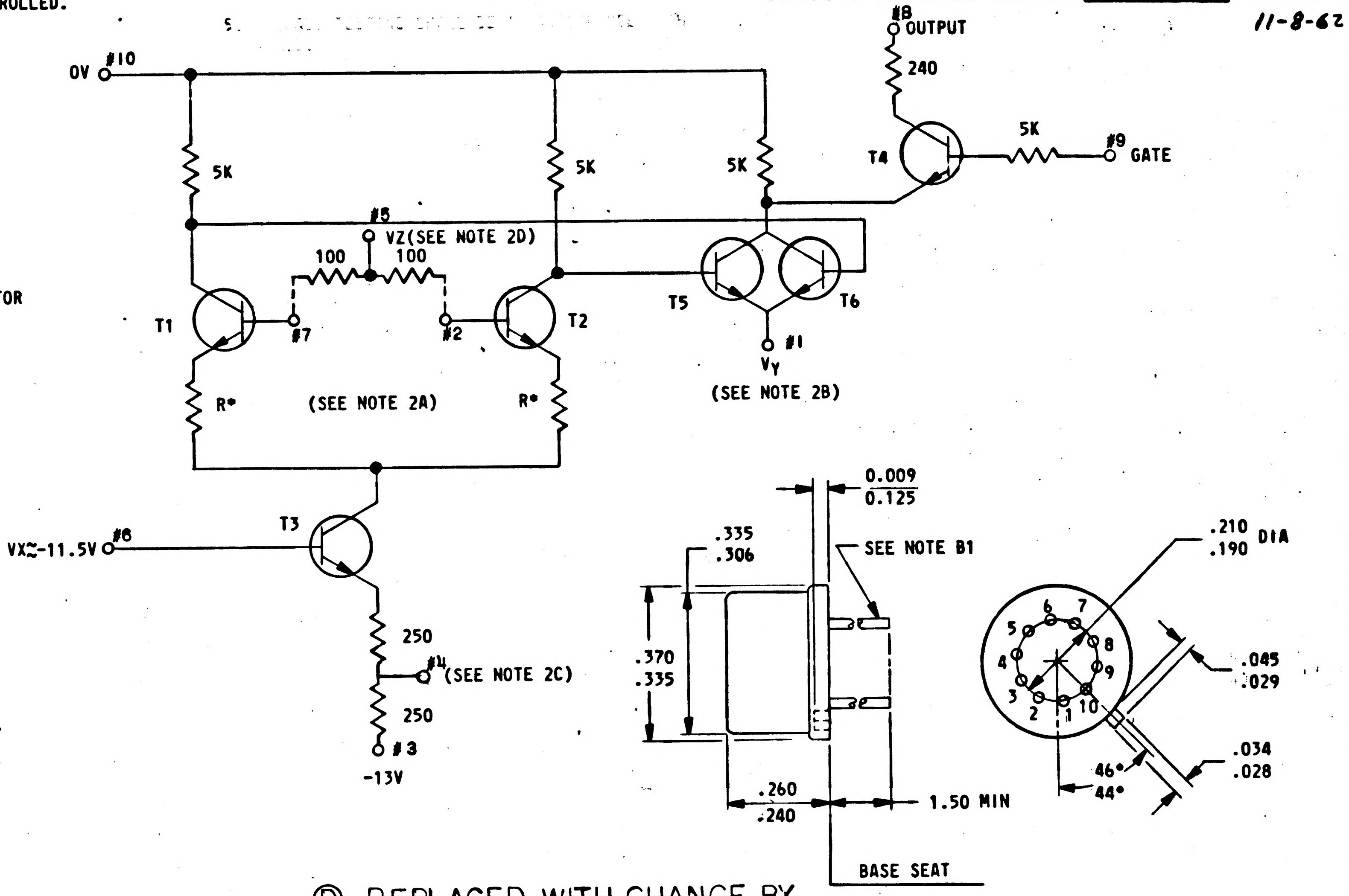
   - D. VZ AND ITS ACCOMPANYING 100 Ω RESISTORS MAY NOT BE USED ON SOME SENSE AMPLIFIERS. WHEN THEY ARE SPECIFIED TO BE USED THEY WILL BE CONNECTED AS SHOWN BY THE DOTTED LINES.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
4.
   - A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER C BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER C.



Ⓓ REPLACED WITH CHANGE BY REV E

MASTER

FOR SOURCE OF SUPPLY SEE QUALIFIED VENDOR LIST ND 1002034

INCHES
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PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DRAWN Ray Wheeler DATE 5 Nov 62
CHECKED W. Maynard 6 Nov '62
APPROVAL [illegible] 7 Nov '62
APPROVAL Eldon C Hall 7 Nov '62
NASA APPROVAL W J Rhine 11-8-62
MIT APPROVAL [illegible] 11/8/62

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HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006769
SCALE NONE | WT | SHEET 1 OF 1

1006769

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E 1006769

SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGE PER TDRR 00513		WL

REVISIONS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00085 **DATE** 11-8-62

NOTES:

1. REQUIREMENTS:
   - A. THIS DEVICE SHALL MEET THE MATERIAL AND WORKMANSHIP REQUIREMENTS OF MIL-S-19500.
   - B. LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETERS SHALL BE AS FOLLOWS:
     - (1) THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000; IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAX, AND IN ALL OTHER ZONES SHALL BE UNCONTROLLED.
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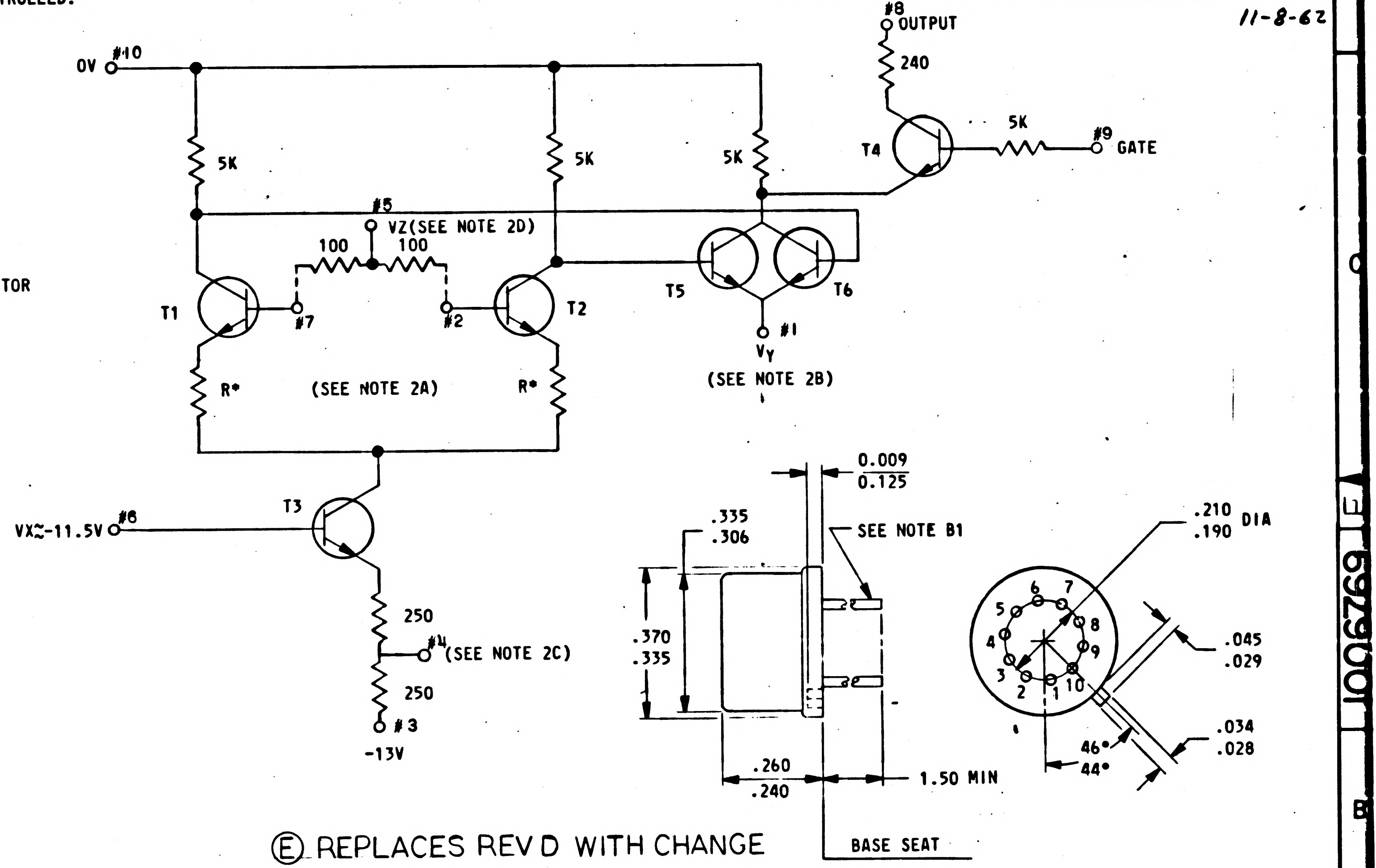
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



Ⓔ REPLACES REV D WITH CHANGE

MASTER

MASTER

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND 1002034

INCHES
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PHOTOGRAPHIC SCALE ONLY

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APPROVAL [illegible] 7 Nov '62
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MIT APPROVAL [illegible] 11/8/62

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SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006769
SCALE NONE
WT
SHEET 1 OF 1

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1006769 F

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
(17) Ė	REPLACES REV D WITH CHANGE PER TDRR 00513		WK
F	REVISED PER TDRR 00806	16 Apr 63	WK

NOTES:

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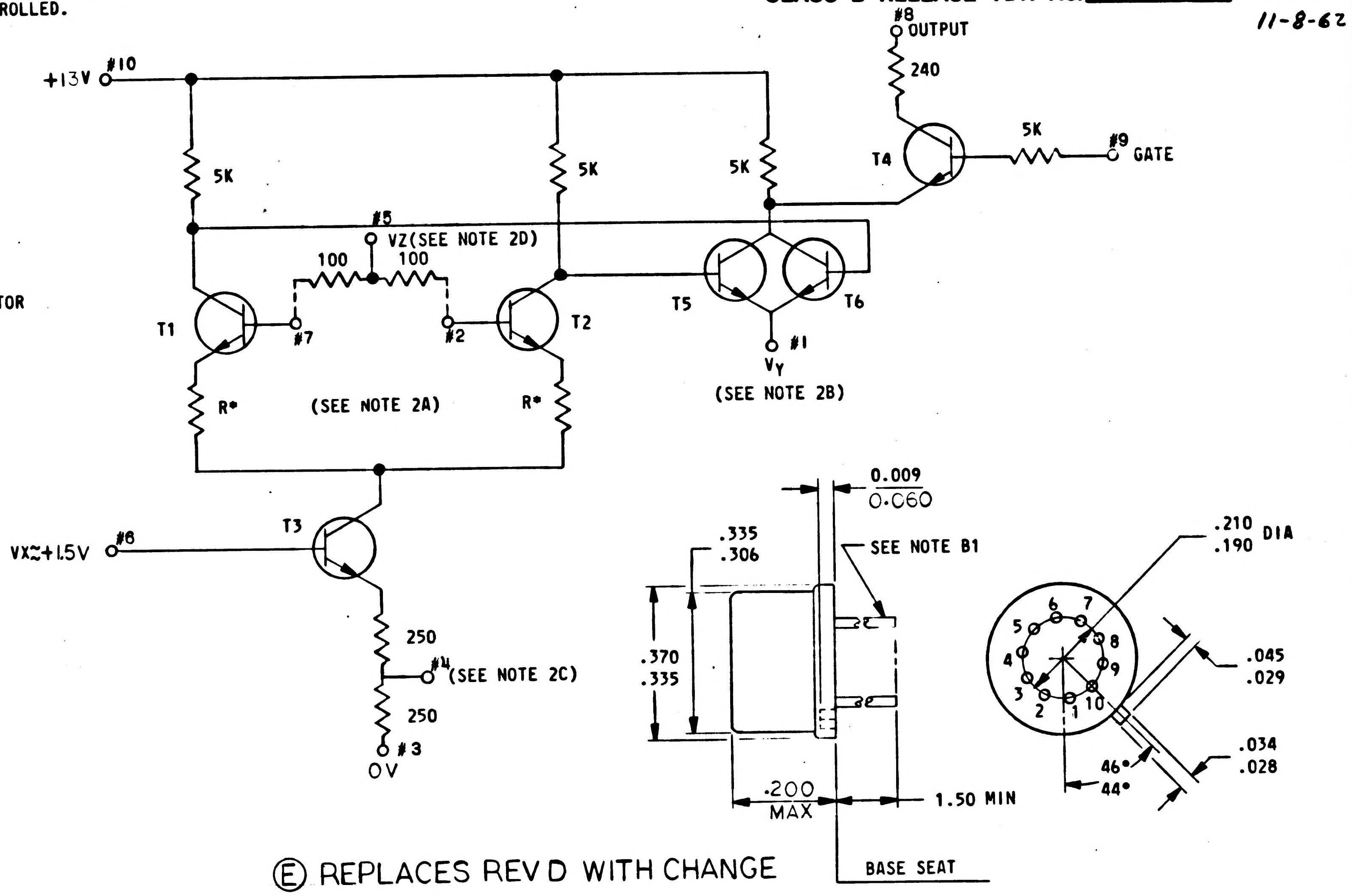
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00085 DATE 11-8-62



Ⓔ REPLACES REV D WITH CHANGE

MASTER

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND 1002034

INCHES
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PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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CHECKED W. Maynard 6 Nov '62
APPROVAL 7 Nov '62
APPROVAL Eldon C Hall 7 Nov '62
NASA APPROVAL 11-8-62
MIT APPROVAL 11/8/62

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SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006769
SCALE NONE	WT	SHEET 1 OF 1

INCHES
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G	1006769

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ E	REPLACES REV D WITH CHANGE PER TDRR 00513		WK
Ⓜ F	REVISED PER TDRR 00706	10 Apr 63	WK.
~~G~~	~~REPLACED BY REV H WITH CHANGES PER TDRR~~ 02823	8/28/63	JV

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CLASS B RELEASE TDR No. 00085 **DATE** 11-8-62

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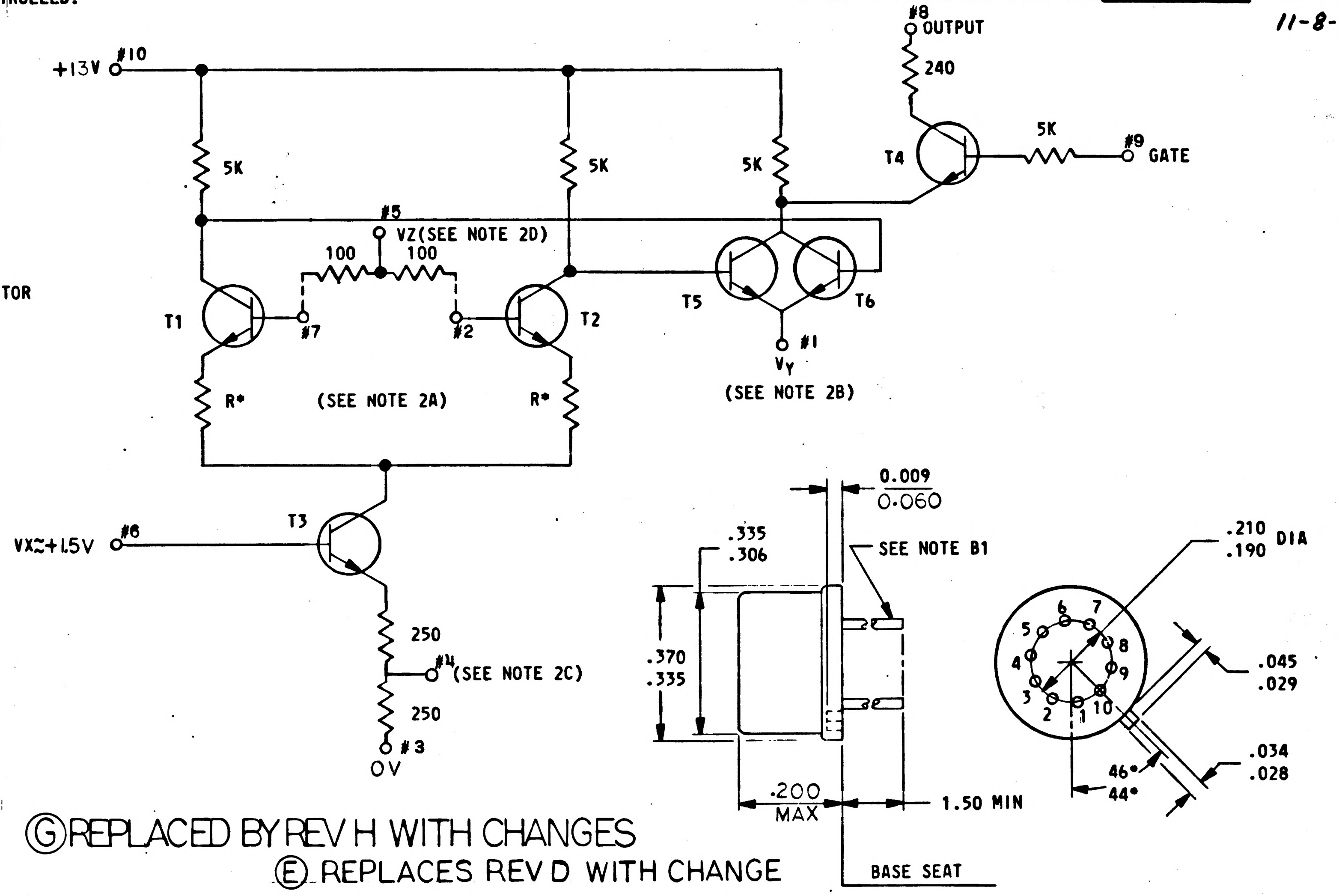

Ⓖ REPLACED BY REV H WITH CHANGES

Ⓔ REPLACES REV D WITH CHANGE

MASTER MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND 1002034

INCHES
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PHOTOGRAPHIC SCALE ONLY

NEXT ASSY	USED ON
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SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006769

SCALE NONE WT SHEET 1 OF 1

1006769 G

INCHES
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H	1006769

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	

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REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE MODIFICATIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS CONTAINED IN ND 1002048 UNLESS MODIFIED OR AMENDED BY SECTION 2 OF THIS DRAWING.

   E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

   A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

   B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE.

   C. ELECTRICAL: 100% TESTING

      (1) UNITS SHALL BE SUBJECTED TO THE ELECTRICAL TESTS SPECIFIED IN ND 1002017.

   D. MECHANICAL: (REFERENCE MIL-STD-750 AS MODIFIED HEREIN)

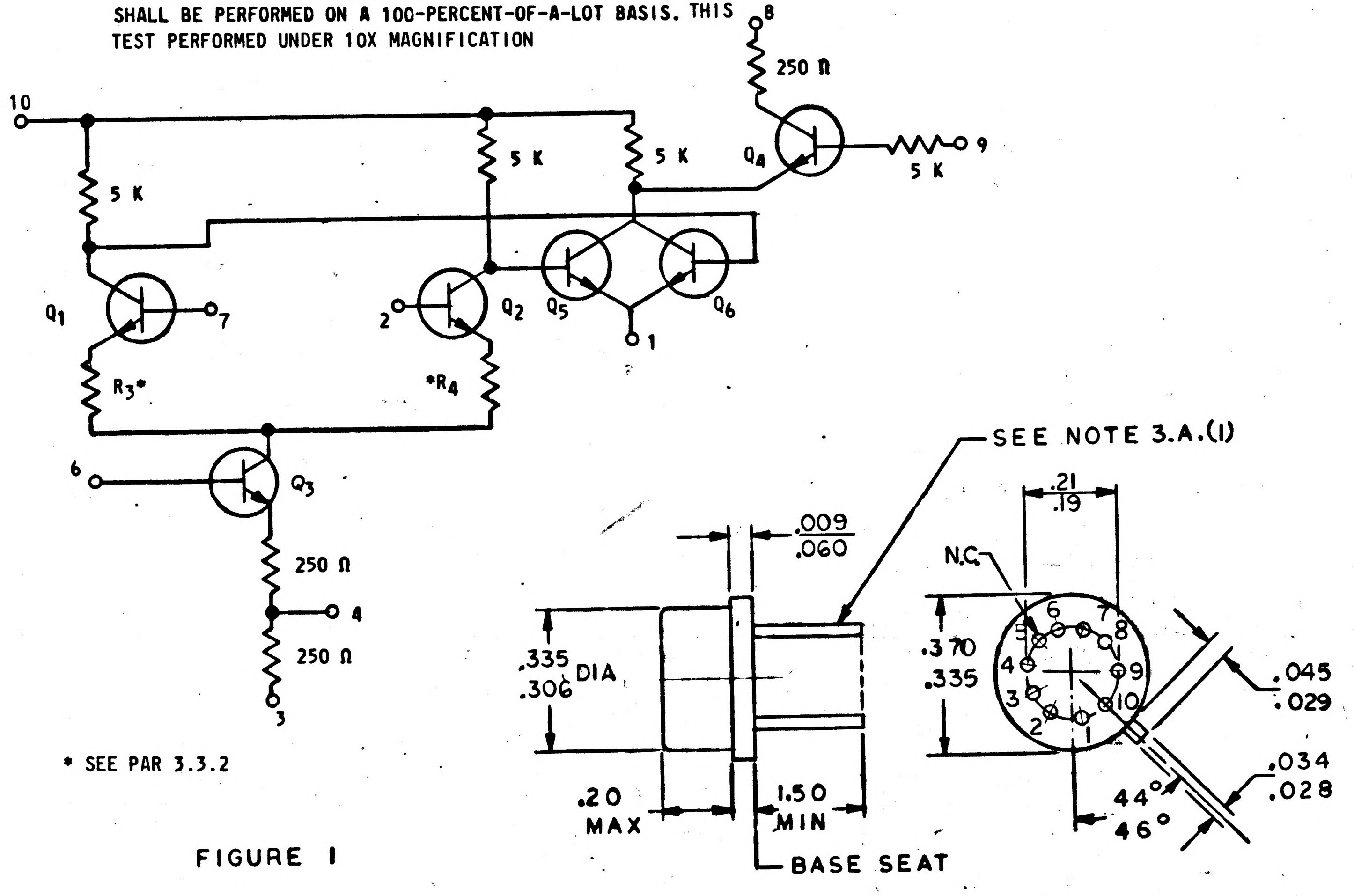
      (1) LEAD FATIGUE (DESTRUCTIVE): LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE-POUND WEIGHT SUSPENDED FROM THE LEAD UNDER TEST. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

      (2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

      (3) THE ABOVE MECHANICAL TEST TO BE PERFORMED ON ELECTRICAL REJECTS.

      (3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELUIM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-6} CUBIC CENTIMETERS PER ATMOSPHERE PER SECOND. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS.

      (4) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS. THIS TEST PERFORMED UNDER 10X MAGNIFICATION



* SEE PAR 3.3.2

FIGURE I

(H) REPLACES REV G WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

H	H
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
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DWG. NO. CONTRACT
DRAWN C. Coop DATE 14 Aug 63
CHECKED J. Ruggi / K. Mayfield 15 Aug 63
APPROVAL R. Darnell 27 Aug 63
APPROVAL Eldon C Hall 27 Aug 63
NASA APPROVAL Jack Bennett
MIT APPROVAL D. Hazel 8/28/63

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SEMICONDUCTOR DEVICE, INTEGRATED SENSE AMPLIFIER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006769
SCALE NONE WT SHEET 1 OF 2

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00085

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H 1006769

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
H	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	9/28/63	

REQUIREMENTS (CONTINUED):

3. DESIGN:

A. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETER SHALL BE AS FOLLOWS: THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000, IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAXIMUM, AND OF THE REMAINDER OF THE LEAD SHALL BE UNCONTROLLED. A CERTIFICATE OF COMPLIANCE WITH THE LEAD MATERIAL REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, SERIAL NUMBER AND THE NUMBER 769. PLUS THE REVISION LETTER

(b) INTERIOR AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING AND THE NASA DRAWING NUMBER AND REVISION LETTER. A TAG MARKED WITH THE FOREGOING INFORMATION SHALL BE INCLUDED IN EACH CONTAINER.

(3) ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED (REFERENCE JEDEC TO-5 CASE).

(4) SEMICONDUCTOR MATERIAL: SILICON, NPN, DIFFUSED OXIDE PASSIVATED SURFACE.

(5) INTERCONNECTIONS: THE DIFFUSED TRANSISTORS AND RESISTORS SHALL BE INTERCONNECTED AS SHOWN IN FIGURE 1.

THE TRANSISTORS SHALL BE SEPARATED FROM EACH OTHER AND FROM RESISTORS BY DIFFUSED ISOLATION REGIONS.

B. ELECTRICAL CHARACTERISTICS:

(1) THE ELECTRICAL CHARACTERISTICS SHALL BE AS SPECIFIED IN SENSE AMPLIFIER ACCEPTANCE TEST PROCEDURE ND 1002017.

(2) THE EQUIVALENT CIRCUIT IS SHOWN IN FIG. 1. THE RESISTOR VALUES SHALL BE ±30%. RESISTOR R_3 AND R_4 SHALL BE GREATER THAN 20 OHMS.

C. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 75 MILLIWATTS MAXIMUM WHILE OPERATING IN THE TEST CIRCUIT OF ND 1002017.

(2) STORAGE TEMPERATURE: MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(3) OPERATING TEMPERATURE: MINUS 20 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THERMAL IMPEDANCE, JUNCTION TO CASE: .087 DEGREE CENTIGRADE PER MILLIWATT.

(5) VOLTAGES: +20 VOLTS BETWEEN PIN 10 AND PIN 3.

4. SPECIAL CONDITIONING:

A. HIGH TEMPERATURE STORAGE: ALL UNITS SHALL BE STORED FOR 250 HOURS AT 150 DEGREES CENTIGRADE MIN

B. THE MANUFACTURER SHALL RECORD THE FOLLOWING CHARACTERISTICS PRIOR TO AND FOLLOWING HIGH TEMPERATURE STORAGE: GAIN (G), VOLTAGE RATIO (V_R), RESOLUTION (R) AND DIFFERENTIAL OFFSET (V_0).

C. PARAMETRIC CHANGE LIMITS:

(1) GAIN (G): PLUS OR MINUS 5 PERCENT.

(2) VOLTAGE RATIO (V_R): PLUS OR MINUS 5 PERCENT.

(3) RESOLUTION (R): PLUS OR MINUS 10 PERCENT.

(4) DIFFERENTIAL OFFSET (V_0): PLUS OR MINUS 5 PERCENT.

D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING HIGH TEMPERATURE STORAGE SHALL NOT BE SHIPPED.

Ⓗ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT

DRAWN C. Crapo DATE 15 Aug 63
CHECKED J. Ruggeri
APPROVAL E. C. Driscoll 27 Aug 63
APPROVAL Ellen C. Hall 27 Aug 63
NASA APPROVAL Jack Barnard
MIT APPROVAL E. Walsh 8/21/63

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HOUSTON, TEXAS

SEMICONDUCTOR DEVICE,
INTEGRATED SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006769
SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

00085

J	1006769

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	
J	REVISED PER TDRR 10117	6/14/	

Ⓜ

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE MODIFICATIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS CONTAINED IN ND 1002048 UNLESS MODIFIED OR AMENDED BY SECTION 2 OF THIS DRAWING.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE.

C. ELECTRICAL: 100% TESTING.

(1) UNITS SHALL BE SUBJECTED TO THE ELECTRICAL TESTS SPECIFIED IN ND 1002017.

D. MECHANICAL: (REFERENCE MIL-STD-750 AS MODIFIED HEREIN)

(1) LEAD FATIGUE (DESTRUCTIVE): LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE-POUND WEIGHT SUSPENDED FROM THE LEAD UNDER TEST. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

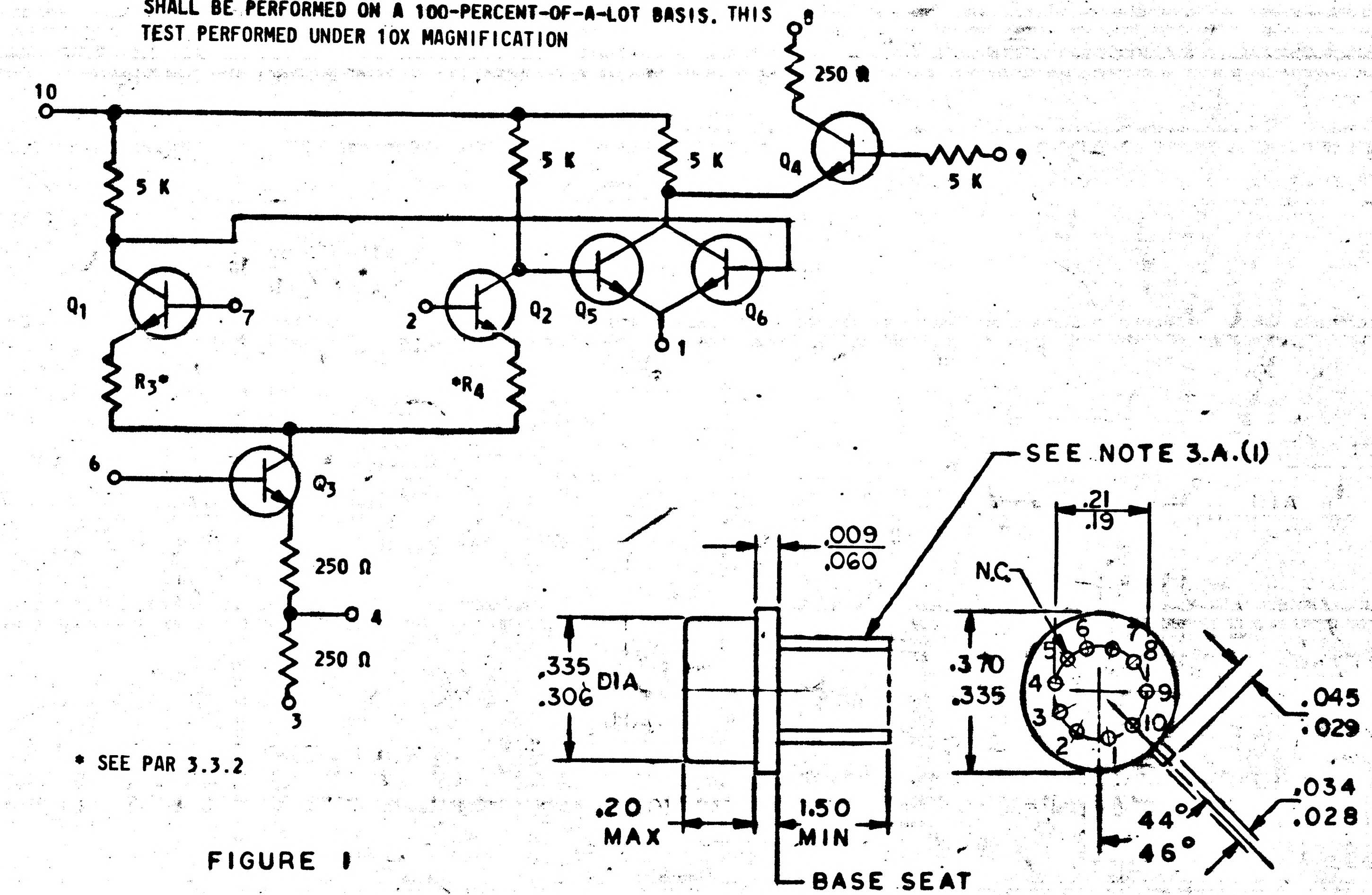
(2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

(3) THE ABOVE MECHANICAL TEST TO BE PERFORMED ON ELECTRICAL REJECTS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELUIM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1×10^{-6} CUBIC CENTIMETERS PER ATMOSPHERE PER SECOND. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS.

(4) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS. THIS TEST PERFORMED UNDER 10X MAGNIFICATION



* SEE PAR 3.3.2

FIGURE 1

Ⓗ REPLACES REV G WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DRAWN C. Coop DATE 14 Aug 63
CHECKED J. Ruggeri / M. Mayfield 15 Aug 63
APPROVAL 27 Aug 63
APPROVAL Eldon C Hall 27 Aug 63
NASA APPROVAL Jack Bennet
MIT APPROVAL D Hoag 8/28/63

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SEMICONDUCTOR DEVICE,
INTEGRATED SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

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SCALE NONE | WT | SHEET 1 OF 2

MASTER

INCHES
0 1 2
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J 1006769

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	
J	REVISED PER TDRR 10117	6/16/64	

Ⓜ

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REQUIREMENTS (CONTINUED):

3. DESIGN:

A. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETER SHALL BE AS FOLLOWS: THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000, IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAXIMUM, AND OF THE REMAINDER OF THE LEAD SHALL BE UNCONTROLLED. A CERTIFICATE OF COMPLIANCE WITH THE LEAD MATERIAL REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 C WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, SERIAL NUMBER AND THE NUMBER 769. PLUS THE REVISION LETTER

(b) INTERIOR AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING AND THE NASA DRAWING NUMBER AND REVISION LETTER. A TAG MARKED WITH THE FOREGOING INFORMATION SHALL BE INCLUDED IN EACH CONTAINER.

(3) ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED (REFERENCE JEDEC TO-5 CASE).

(4) SEMICONDUCTOR MATERIAL: SILICON, NPN, DIFFUSED OXIDE PASSIVATED SURFACE.

(5) INTERCONNECTIONS: THE DIFFUSED TRANSISTORS AND RESISTORS SHALL BE INTERCONNECTED AS SHOWN IN FIGURE 1.

THE TRANSISTORS SHALL BE SEPARATED FROM EACH OTHER AND FROM RESISTORS BY DIFFUSED ISOLATION REGIONS.

B. ELECTRICAL CHARACTERISTICS:

(1) THE ELECTRICAL CHARACTERISTICS SHALL BE AS SPECIFIED IN SENSE AMPLIFIER ACCEPTANCE TEST PROCEDURE ND 1002017.

(2) THE EQUIVALENT CIRCUIT IS SHOWN IN FIG. 1. THE RESISTOR VALUES SHALL BE ±30%. RESISTOR R_3 AND R_4 SHALL BE GREATER THAN 20 OHMS.

C. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 75 MILLIWATTS MAXIMUM WHILE OPERATING IN THE TEST CIRCUIT OF [illegible] ND 1002017.

(2) STORAGE TEMPERATURE: MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(3) OPERATING TEMPERATURE: MINUS 20 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THERMAL IMPEDANCE, JUNCTION TO CASE: .087 DEGREE CENTIGRADE PER MILLIWATT.

(5) VOLTAGES: +20 VOLTS BETWEEN PIN 10 AND PIN 3.

4. SPECIAL CONDITIONING:

A. HIGH TEMPERATURE STORAGE: ALL UNITS SHALL BE STORED FOR 250 HOURS AT 150 DEGREES CENTIGRADE MIN

B. ALL UNITS SHALL BE SUBJECTED TO, AND MEET THE REQUIREMENTS OF CONSTANT ACCELERATION TESTS (20,000G) PER MIL-S-19500 METHOD 2006.

C. THE MANUFACTURER SHALL RECORD THE CHARACTERISTICS LISTED IN TABLE I PRIOR TO AND FOLLOWING HIGH TEMPERATURE STORAGE: [illegible] (V_0).

C. [illegible]

D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING HIGH TEMPERATURE STORAGE SHALL NOT BE SHIPPED.

TABLE I

ELECTRICAL CHARACTERISTICS AS SPECIFIED IN ACCEPTANCE TEST PROCEDURE ND 1002017		
SECTION	PARAMETER	CHANGE LIMIT
4.8.1.1	$G_1 = V_{03}$	± 10%
4.8.1.2	$G_5 = V_{09}$	± 10%
4.8.1.3	$VR = V_{07} - V_{01}$	± 10%
4.7.3.1	LEAKAGE: $Q_1 + Q_2$	± 30% OR + 75 NANO AMPS

TABLE I: ALLOWABLE PARAMETER CHANGE LIMITS

Ⓗ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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CONTRACT
DRAWN C. Crapo DATE 15 Aug 63
CHECKED J. Ruggier
APPROVAL E. C. Driscoll 27 Aug 63
APPROVAL Eldon C. Hall 27 Aug 63
NASA APPROVAL
MIT APPROVAL

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INTEGRATED SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006769
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	
J	REVISED PER TDRR 10117	6/14/64	
K	REVISED PER TDRR 11331	8/12/64	WH

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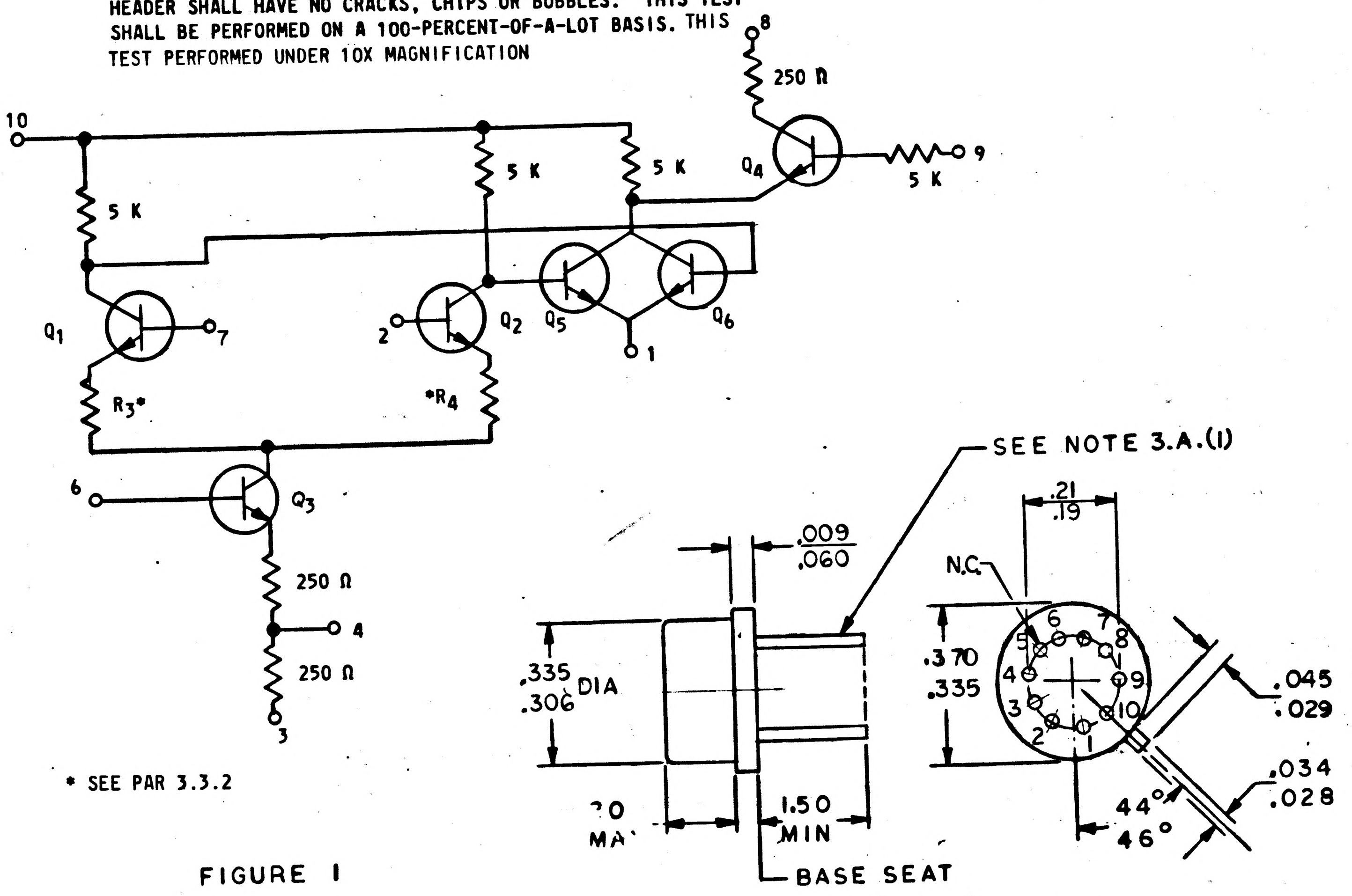
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE MODIFICATIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS CONTAINED IN ND 1002048 UNLESS MODIFIED OR AMENDED BY SECTION 2 OF THIS DRAWING.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491, LEVEL A IN BOTH INSTANCES.
2. ACCEPTANCE AND INSPECTION:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE.
   - C. ELECTRICAL: 100% TESTING
     - (1) UNITS SHALL BE SUBJECTED TO THE ELECTRICAL TESTS SPECIFIED IN ND 1002017.
   - D. MECHANICAL: (REFERENCE MIL-STD-750 AS MODIFIED HEREIN)
     - (1) LEAD FATIGUE (DESTRUCTIVE): LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE-POUND WEIGHT SUSPENDED FROM THE LEAD UNDER TEST. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.
     - (2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.
     - (3) THE ABOVE MECHANICAL TEST TO BE PERFORMED ON ELECTRICAL REJECTS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELUIM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-6} CUBIC CENTIMETERS PER ATMOSPHERE PER SECOND. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS.

(4) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS. THIS TEST PERFORMED UNDER 10X MAGNIFICATION



* SEE PAR 3.3.2

FIGURE 1

Ⓗ REPLACES REV G WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT
DRAWN C. Cooper DATE 19 Aug 63
CHECKED J. Ruggeri 15 Aug 63
APPROVAL 27 Aug 63
APPROVAL Eldon C Hall 27 Aug 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
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SEMICONDUCTOR DEVICE, INTEGRATED SENSE AMPLIFIER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006769
SCALE NONE
WT
SHEET 1 OF 2

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0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ H	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	
Ⓜ J	REVISED PER TDRR 10117	6/16/64	
K	REVISED PER TDRR 11331	8/12/64	

REQUIREMENTS (CONTINUED):

3. DESIGN:

A. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETER SHALL BE AS FOLLOWS: THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000, IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAXIMUM, AND OF THE REMAINDER OF THE LEAD SHALL BE UNCONTROLLED. A CERTIFICATE OF COMPLIANCE WITH THE LEAD MATERIAL REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, SERIAL NUMBER AND THE NUMBER 769. PLUS THE REVISION LETTER

(b) INTERIOR AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING AND THE NASA DRAWING NUMBER AND REVISION LETTER. A TAG MARKED WITH THE FOREGOING INFORMATION SHALL BE INCLUDED IN EACH CONTAINER.

(3) ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED (REFERENCE JEDEC TO-5 CASE).

(4) SEMICONDUCTOR MATERIAL: SILICON, NPN, DIFFUSED OXIDE PASSIVATED SURFACE.

(5) INTERCONNECTIONS: THE DIFFUSED TRANSISTORS AND RESISTORS SHALL BE INTERCONNECTED AS SHOWN IN FIGURE 1.

THE TRANSISTORS SHALL BE SEPARATED FROM EACH OTHER AND FROM RESISTORS BY DIFFUSED ISOLATION REGIONS.

B. ELECTRICAL CHARACTERISTICS:

(1) THE ELECTRICAL CHARACTERISTICS SHALL BE AS SPECIFIED IN SENSE AMPLIFIER ACCEPTANCE TEST PROCEDURE ND 1002017.

(2) THE EQUIVALENT CIRCUIT IS SHOWN IN FIG. 1. THE RESISTOR VALUES SHALL BE ±30%. RESISTOR R_3 AND R_4 SHALL BE GREATER THAN 20 OHMS.

C. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 75 MILLIWATTS MAXIMUM WHILE OPERATING IN THE TEST CIRCUIT OF ND 1002017.

(2) STORAGE TEMPERATURE: MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(3) OPERATING TEMPERATURE: MINUS 20 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THERMAL IMPEDANCE, JUNCTION TO CASE: .087 DEGREE CENTIGRADE PER MILLIWATT.

(5) VOLTAGES: +20 VOLTS BETWEEN PIN 10 AND PIN 3.

4. SPECIAL CONDITIONING:

A. HIGH TEMPERATURE STORAGE: ALL UNITS SHALL BE STORED FOR 250 HOURS AT 150 DEGREES CENTIGRADE MIN

B. ALL UNITS SHALL BE SUBJECTED TO, AND MEET THE REQUIREMENTS OF CONSTANT ACCELERATION TESTS (20,000G) PER MIL-S-19500 METHOD 2006.

C. THE MANUFACTURER SHALL RECORD THE CHARACTERISTICS LISTED IN TABLE I PRIOR TO AND FOLLOWING HIGH TEMPERATURE STORAGE:

D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING HIGH TEMPERATURE STORAGE SHALL NOT BE SHIPPED.

TABLE I

ELECTRICAL CHARACTERISTICS AS SPECIFIED IN ACCEPTANCE TEST PROCEDURE ND 1002017		
SECTION	PARAMETER	CHANGE LIMIT
4.8.1.1	$G_1 = V_{03}$	± 10%
4.8.1.2	$G_5 = V_{09}$	± 10%
4.8.1.3	$VR = V_{07} - V_{01}$	± 10%

TABLE I: ALLOWABLE PARAMETER CHANGE LIMITS

Ⓗ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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CONTRACT

DRAWN DATE 15 Aug 63
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APPROVAL 27 Aug 63
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CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006769
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
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1006769 L

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H	REPLACES REV G WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	
J	REVISED PER TDRR 10117	6/14/67	
K	REVISED PER TDRR 11331	8/12/64	WH
L	REVISED PER TDRR 13428	10/24/64	
	REPLACED WITH CHANGE BY REV M PER TDRR 30660	26-SEP-66	B. PF

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE MODIFICATIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS CONTAINED IN ND 1002048 UNLESS MODIFIED OR AMENDED BY SECTION 2 OF THIS DRAWING.

   E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

   A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

   B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE.

   C. ELECTRICAL: 100% TESTING

      (1) UNITS SHALL BE SUBJECTED TO THE ELECTRICAL TESTS SPECIFIED IN ND 1002017.

   D. MECHANICAL: (REFERENCE MIL-STD-750 AS MODIFIED HEREIN)

      (1) LEAD FATIGUE (DESTRUCTIVE): LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE-POUND WEIGHT SUSPENDED FROM THE LEAD UNDER TEST. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

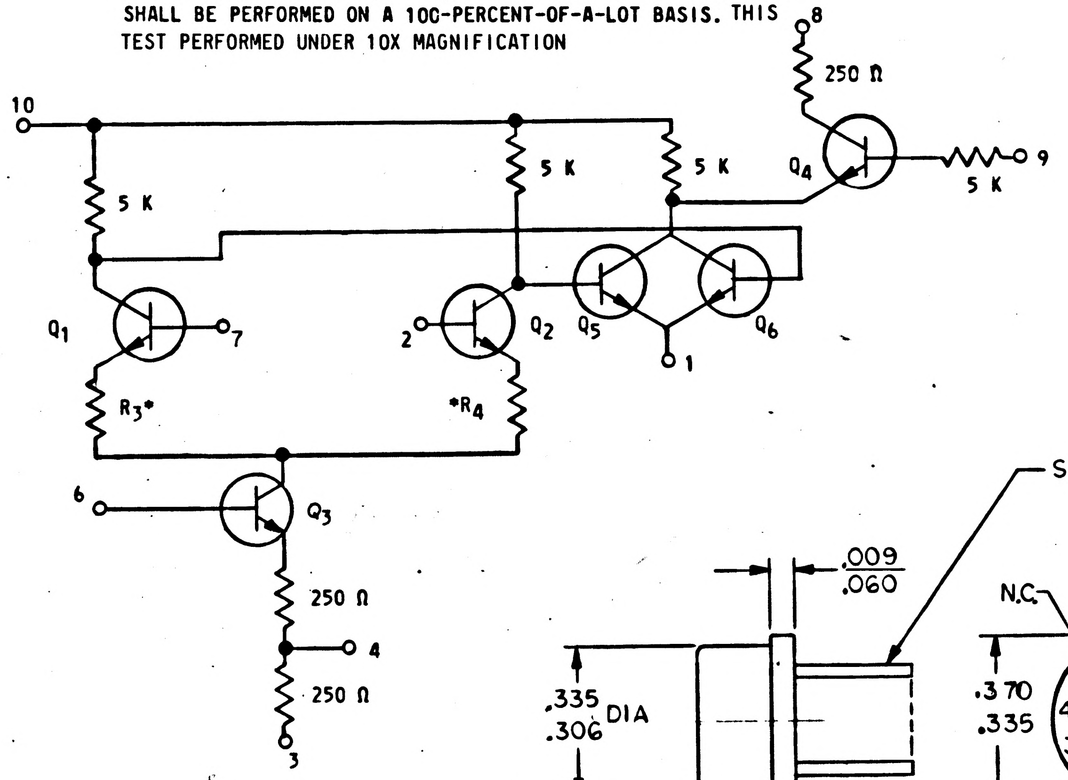
      (2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

      (3) THE ABOVE MECHANICAL TEST TO BE PERFORMED ON ELECTRICAL REJECTS.

      (4) (3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELUIM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-6} CUBIC CENTIMETERS PER ATMOSPHERE PER SECOND. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS.

      (5) (4) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS. THIS TEST PERFORMED UNDER 10X MAGNIFICATION

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



* SEE PAR 3.3.2

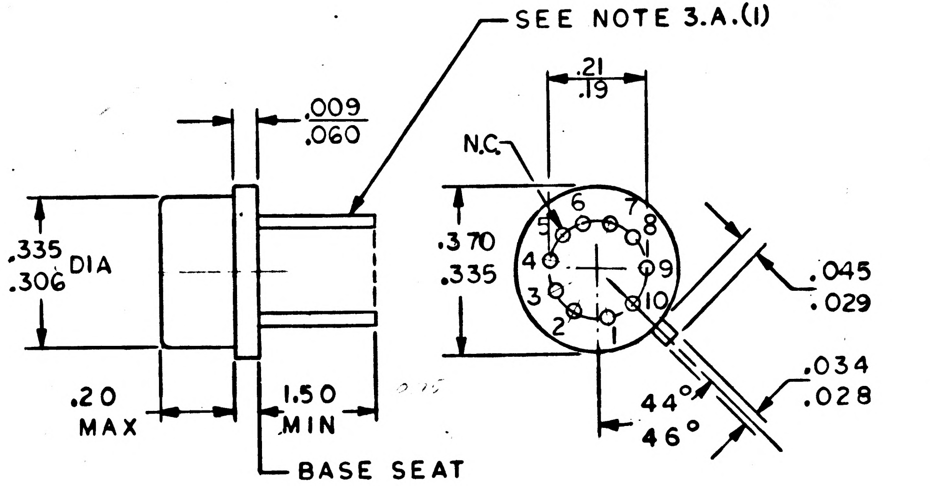


FIGURE I

(H) REPLACES REV G WITH CHANGES **SUPERSEDED**

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Coop DATE 14 Aug 63
CHECKED J. Ruggeri 15 Aug 63
APPROVAL 27 Aug 63
APPROVAL Eldon C Hall 27 Aug 63
NASA APPROVAL Jack Barnard
MIT APPROVAL D Hazel 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, INTEGRATED SENSE AMPLIFIER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006769
SCALE NONE WT SHEET 1 OF 2

1006769

00085

7 | 1006769

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	
J	REVISED PER TDRR 10117	6/16/64	
K	REVISED PER TDRR 11331	8/12/64	WH
L	REVISED PER TDRR 13428	10/24/64	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE MODIFICATIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS CONTAINED IN ND 1002048 UNLESS MODIFIED OR AMENDED BY SECTION 2 OF THIS DRAWING.

   E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION:

   A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

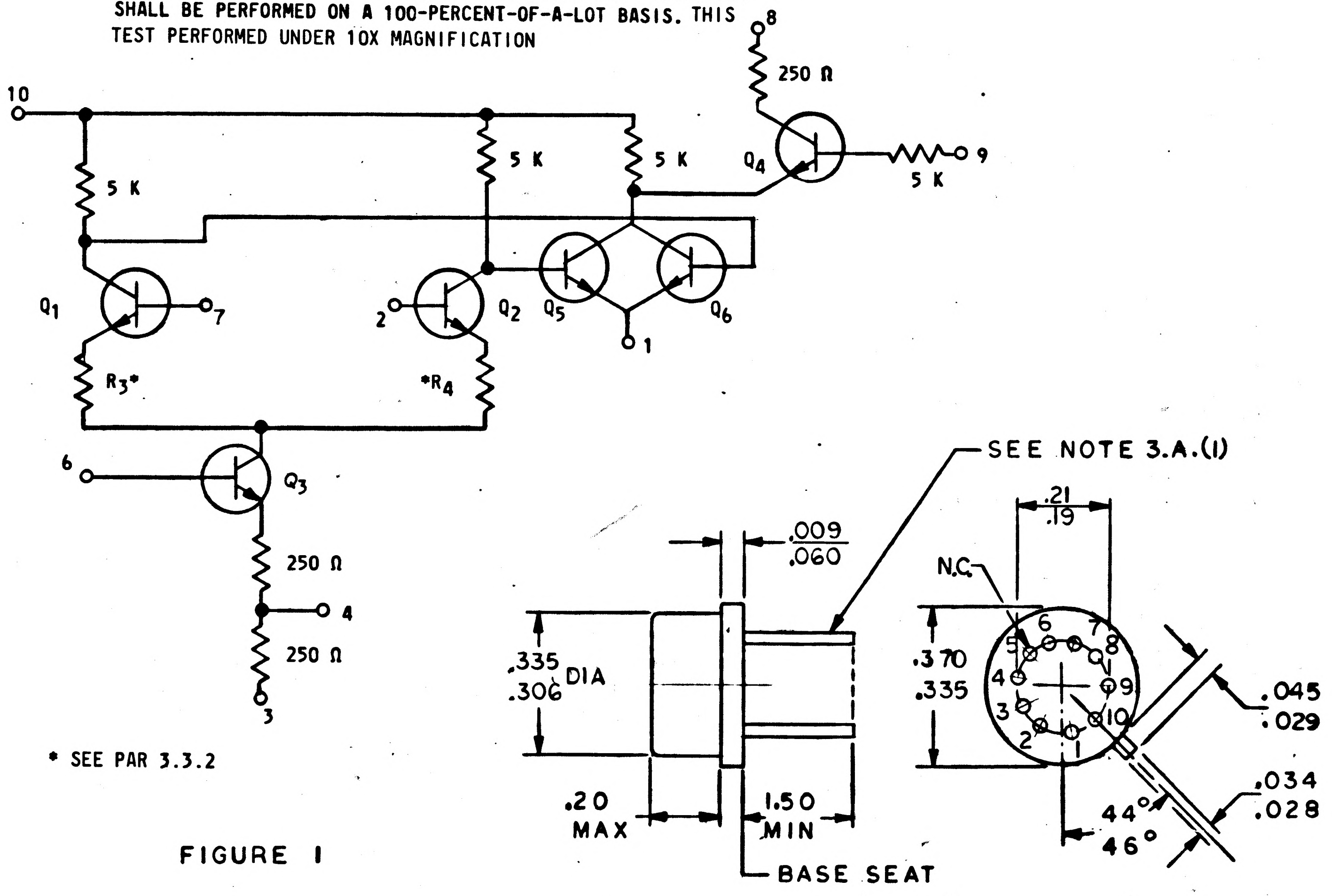
   B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE.

   C. ELECTRICAL: 100% TESTING

      (1) UNITS SHALL BE SUBJECTED TO THE ELECTRICAL TESTS SPECIFIED IN ND 1002017.

      (3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELUIM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1×10^{-6} CUBIC CENTIMETERS PER ATMOSPHERE PER SECOND. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS.

      (4) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS. THIS TEST PERFORMED UNDER 10X MAGNIFICATION



* SEE PAR 3.3.2

FIGURE I

   D. MECHANICAL: (REFERENCE MIL-STD-750 AS MODIFIED HEREIN)

      (1) LEAD FATIGUE (DESTRUCTIVE): LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE-POUND WEIGHT SUSPENDED FROM THE LEAD UNDER TEST. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

      (2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.

      (3) THE ABOVE MECHANICAL TEST TO BE PERFORMED ON ELECTRICAL REJECTS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

Ⓗ REPLACES REV G WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Cas DATE 13 Aug 63
CHECKED J. Ruggeri / H. Mayfield 15 Aug 63
APPROVAL 27 Aug 63
APPROVAL Eldon C Hall 27 Aug 63
NASA APPROVAL Jack Bauman
MIT APPROVAL D. Hazel 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE,
INTEGRATED SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006769
SCALE NONE
WT
SHEET 1 OF 2

1006769

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1 C-085

1006769 L

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02823	8/28/63	
J	REVISED PER TDRR 10117	6/16/64	
K	REVISED PER TDRR 11331	8/12/64	WK.
L	REVISED PER TDRR 13428	10/24/64	

REQUIREMENTS (CONTINUED):

3. DESIGN:

A. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETER SHALL BE AS FOLLOWS: THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000, IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAXIMUM, AND OF THE REMAINDER OF THE LEAD SHALL BE UNCONTROLLED. A CERTIFICATE OF COMPLIANCE WITH THE LEAD MATERIAL REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, SERIAL NUMBER AND THE NUMBER 769. PLUS THE REVISION LETTER

(b) INTERIOR AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING AND THE NASA DRAWING NUMBER AND REVISION LETTER. A TAG MARKED WITH THE FOREGOING INFORMATION SHALL BE INCLUDED IN EACH CONTAINER.

(3) ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED (REFERENCE JEDEC TO-5 CASE).

(4) SEMICONDUCTOR MATERIAL: SILICON, NPN, DIFFUSED OXIDE PASSIVATED SURFACE.

(5) INTERCONNECTIONS: THE DIFFUSED TRANSISTORS AND RESISTORS SHALL BE INTERCONNECTED AS SHOWN IN FIGURE 1.

THE TRANSISTORS SHALL BE SEPARATED FROM EACH OTHER AND FROM RESISTORS BY DIFFUSED ISOLATION REGIONS.

B. ELECTRICAL CHARACTERISTICS:

(1) THE ELECTRICAL CHARACTERISTICS SHALL BE AS SPECIFIED IN SENSE AMPLIFIER ACCEPTANCE TEST PROCEDURE ND 1002017.

(2) THE EQUIVALENT CIRCUIT IS SHOWN IN FIG. 1. THE RESISTOR VALUES SHALL BE ±30%. RESISTOR R_3 AND R_4 SHALL BE GREATER THAN 20 OHMS.

C. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 75 MILLIWATTS MAXIMUM WHILE OPERATING IN THE TEST CIRCUIT OF ND 1002017.

(2) STORAGE TEMPERATURE: MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(3) OPERATING TEMPERATURE: MINUS 20 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THERMAL IMPEDANCE, JUNCTION TO CASE: .087 DEGREE CENTIGRADE PER MILLIWATT.

(5) VOLTAGES: +20 VOLTS BETWEEN PIN 10 AND PIN 3.

4. SPECIAL CONDITIONING:

A. HIGH TEMPERATURE STORAGE: ALL UNITS SHALL BE STORED FOR 250 HOURS AT 150 DEGREES CENTIGRADE MIN

B. ALL UNITS SHALL BE SUBJECTED TO, AND MEET THE REQUIREMENTS OF CONSTANT ACCELERATION TESTS (20,000G) PER MIL-STD-750 METHOD 2006.

C. THE MANUFACTURER SHALL RECORD THE CHARACTERISTICS LISTED IN TABLE I PRIOR TO AND FOLLOWING HIGH TEMPERATURE STORAGE:

D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING HIGH TEMPERATURE STORAGE SHALL NOT BE SHIPPED.

TABLE I

ELECTRICAL CHARACTERISTICS AS SPECIFIED IN ACCEPTANCE TEST PROCEDURE ND 1002017		
SECTION	PARAMETER	CHANGE LIMIT
4.8.1.1	$G_1 = V_{03}$	± 10%
4.8.1.2	$G_5 = V_{09}$	± 10%
4.8.3.	$VR = V_{07}-V_{01}$	± 10%
. . .		

TABLE I: ALLOWABLE PARAMETER CHANGE LIMITS

(H) THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crisp DATE
CHECKED J. Ruggiero 15 Aug 63
APPROVAL E.C. Driscoll 27 Aug 63
APPROVAL Ellen C. Hall 27 Aug 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE,
INTEGRATED SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006769
SCALE NONE | WT | SHEET 2 OF 2

MASTER

4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

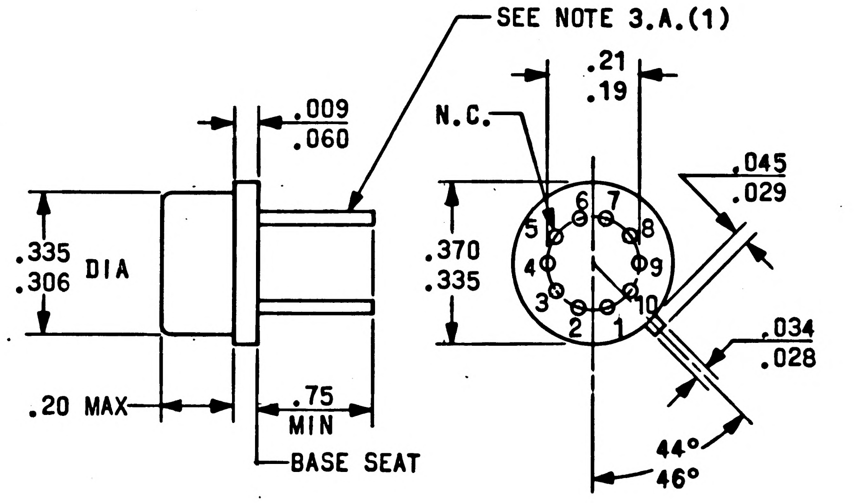
1006769

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	M	REPLACES REV L WITH CHANGE PER TDRR 30660	26-SEP-66	B. P7

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 WITH THE MODIFICATIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS CONTAINED IN ND 1002048 UNLESS MODIFIED OR AMENDED BY SECTION 2 OF THIS DRAWING.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-S-19491, LEVEL A IN BOTH INSTANCES.
   - F. EACH LOT OF DEVICES AS SPECIFIED BY THIS DRAWING SHALL MEET THE REQUIREMENTS OF ND 1002265 WHEN PROCESSED TO THAT SPECIFICATION IN THE BUYER'S PLANT. LOTS OR SUBLOTS REJECTED BY THE CRITERIA OF ND 1002265 MAY BE RETURNED TO THE VENDOR.

2. ACCEPTANCE AND INSPECTION:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE.
   - C. ELECTRICAL: 100% TESTING.
     - (1) UNITS SHALL BE SUBJECTED TO THE ELECTRICAL TESTS SPECIFIED IN ND 1002017.
   - D. MECHANICAL: (REFERENCE MIL-STD-750 AS MODIFIED HEREIN)
     - (1) LEAD FATIGUE (DESTRUCTIVE): LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE-POUND WEIGHT SUSPENDED FROM THE LEAD UNDER TEST. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.
     - (2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST. A SAMPLE OF 3 UNITS PER LOT SHALL BE TESTED.
     - (3) THE ABOVE MECHANICAL TEST TO BE PERFORMED ON ELECTRICAL REJECTS.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + — − 3 PLACE DECIMALS + — − ANGLES + — −	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN CRESPI DATE 14 AUG 63 CHECKED RUGGEIN 15 AUG 63 APPROVAL DRISOLL 27 AUG 63 CONTRACT NAS 9-497	SEMICONDUCTOR DEVICE, INTEGRATED SENSE AMPLIFIER SPECIFICATION CONTROL DRAWING
MATERIAL SEE REQUIREMENTS	JACK BARNARD NASA APPROVAL	SIZE C CODE IDENT NO. 80230 1006769
APPROVAL	I. HAZEL 28 AUG 63 MIT APPROVAL	SCALE NONE SHEET 1 of 3

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	M	*REPLACES REV L WITH CHANGE PER TDRR 30660*	26-SEP-66	B. P7

REQUIREMENTS: (CONTINUED)

(4) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELUIM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 5 X 10^{-8} CUBIC CENTIMETERS PER ATMOSPHERE PER SECOND. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND SHALL COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES. THIS TEST SHALL BE PERFORMED ON A 100-PERCENT-OF-A-LOT BASIS. THIS TEST PERFORMED UNDER 10 X MAGNIFICATION.

3. DESIGN:

A. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETER SHALL BE AS FOLLOWS: THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000, IN THE ZONE BETWEEN .250 AND 0.75 FROM THE BASE SEAT SHALL BE .021 MAXIMUM, AND OF THE REMAINDER OF THE LEAD SHALL BE UNCONTROLLED. A CERTIFICATE OF COMPLIANCE WITH THE LEAD MATERIAL REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, SERIAL NUMBER AND THE NUMBER 769. PLUS THE REVISION LETTER

(b) INTERIOR AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING AND THE NASA DRAWING NUMBER AND REVISION LETTER. A TAG MARKED WITH THE FOREGOING INFORMATION SHALL BE INCLUDED IN EACH CONTAINER.

(3) ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED (REFERENCE JEDEC TO-5 CASE).

(4) SEMICONDUCTOR MATERIAL: SILICON, NPN, DIFFUSED OXIDE PASSIVATED SURFACE.

(5) INTERCONNECTIONS: THE DIFFUSED TRANSISTORS AND RESISTORS SHALL BE INTERCONNECTED AS SHOWN IN FIGURE 1. THE TRANSISTORS SHALL BE SEPARATED FROM EACH OTHER AND FROM RESISTORS BY DIFFUSED ISOLATION REGIONS.

B. ELECTRICAL CHARACTERISTICS:

(1) THE ELECTRICAL CHARACTERISTICS SHALL BE AS SPECIFIED IN SENSE AMPLIFIER ACCEPTANCE TEST PROCEDURE ND 1002017.

(2) THE EQUIVALENT CIRCUIT IS SHOWN IN FIG. 1. THE RESISTOR VALUES SHALL BE ± 30% AT A TEST CURRENT OF 2.0 MADC. RESISTOR R_3 AND R_4 SHALL BE GREATER THAN 20 OHMS AT A TEST CURRENT OF 1.0 MADC.

C. ABSOLUTE MAXIMUM RATINGS:

(1) POWER DISSIPATION: 75 MILLIWATTS MAXIMUM WHILE OPERATING IN THE TEST CIRCUIT OF ND 1002017.

(2) STORAGE TEMPERATURE: MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(3) OPERATING TEMPERATURE: MINUS 20 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THERMAL IMPEDANCE, JUNCTION TO CASE: .087 DEGREE CENTIGRADE PER MILLIWATT.

(5) VOLTAGES: ±25 VOLTS BETWEEN PIN 10 AND PIN 3.

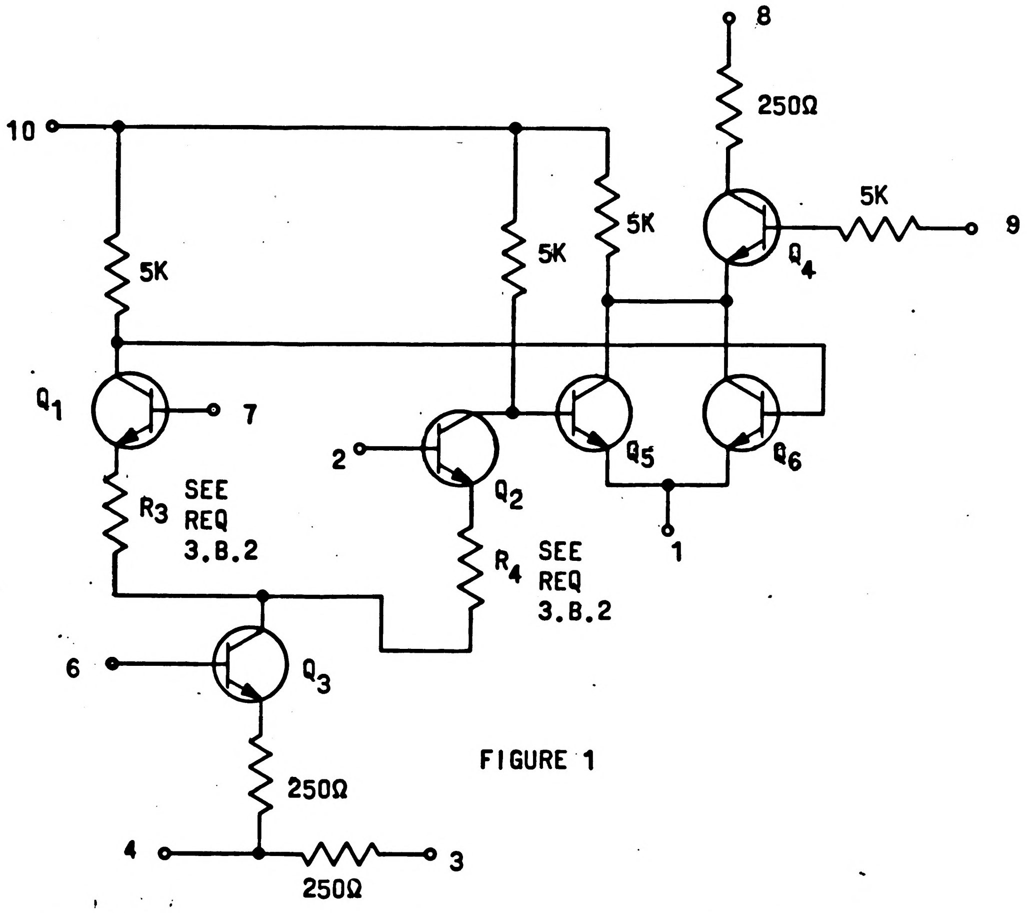


FIGURE 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + − 3 PLACE DECIMALS + − ANGLES + −	MIT INSTRUMENTATION LAB CAMBRIDGE MASS	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN CRESPI DATE 14 AUG 63 CHECKED RUGGEIN 15 AUG 63 APPROVAL DRISCOLL 27 AUG63 CONTRACT NAS 9-497	SEMICONDUCTOR DEVICE, INTEGRATED SENSE AMPLIFIER SPECIFICATION CONTROL DRAWING
MATERIAL	*JACK BARNARD* NASA APPROVAL *I. HAZEL 28 AUG 63* MIT APPROVAL	SIZE C CODE IDENT NO. 80230 1006769
APPROVAL		SCALE SHEET 2 OF 3

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	M	THIS SHEET ADDED PER TDRR 30660	26-SEP-66	B. P7

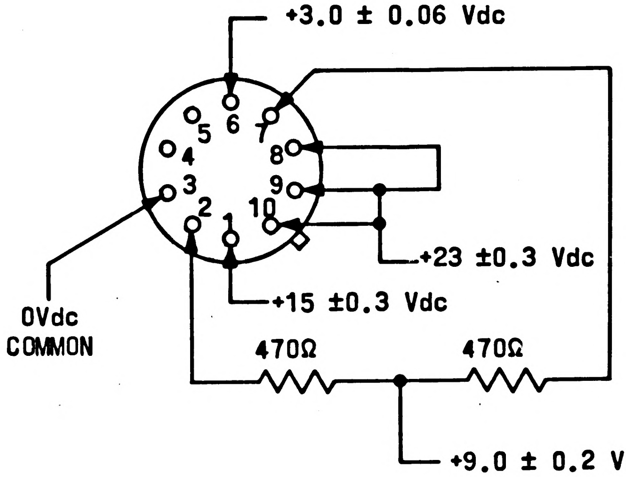
REQUIREMENTS: (CONTINUED)

4. SPECIAL CONDITIONING:
   - A. HIGH TEMPERATURE STORAGE: ALL UNITS SHALL BE STORED FOR 250 HOURS AT 150 DEGREES CENTIGRADE MIN.
   - B. ALL UNITS SHALL BE SUBJECTED TO, A CONSTANT ACCELERATION TESTS (20,000G) PER MIL-STD-750 METHOD 2006.
   - C. THE MANUFACTURER SHALL RECORD THE CHARACTERISTICS LISTED IN TABLE I PRIOR TO AND FOLLOWING HIGH TEMPERATURE STORAGE.
   - D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OF ND 1002017 OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING HIGH TEMPERATURE STORAGE SHALL NOT BE SHIPPED.

TABLE I

ELECTRICAL CHARACTERISTICS AS SPECIFIED IN ACCEPTANCE TEST PROCEDURE ND 1002017		
SECTION	PARAMETER	CHANGE LIMIT
4.8.1.1	$G_1 = V_{02}$	±10%
4.8.1.2	$G_5 = V_{07}$	±10%
4.8.3	$VR = V_{06}-V_{01}$	±10%

TABLE I: ALLOWABLE PARAMETER CHANGE LIMITS



OPERATING LIFE
TEST CIRCUIT
FIGURE 11

THIS SHEET ADDED

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + − 3 PLACE DECIMALS + − ANGLES + −	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN Bender DATE 26-SEP-66 CHECKED Fesler 29SEP66 APPROVAL CONTRACT NAS 9-497	SEMICONDUCTOR DEVICE, INTEGRATED SENSE AMPLIFIER SPECIFICATION CONTROL DRAWING
MATERIAL	JACK BARNARD NASA APPROVAL I. HAZEL 28 AUG 63 MIT APPROVAL	SIZE C CODE IDENT NO. 80230 1006769
APPROVAL		SCALE SHEET 3 of 3

1006769

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

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NOTES:

1. REQUIREMENTS:
   - A. THIS DEVICE SHALL MEET THE MATERIAL AND WORKMANSHIP REQUIREMENTS OF MIL-S-19500.
   - B. LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402 EXCEPT LEAD DIAMETERS SHALL BE AS FOLLOWS:
     - (1) THE LEAD DIAMETER IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT SHALL BE .016 PLUS .003 MINUS .000; IN THE ZONE BETWEEN .250 AND 1.5 FROM THE BASE SEAT SHALL BE .021 MAX, AND IN ALL OTHER ZONES SHALL BE UNCONTROLLED.
   - C. UNITS SHALL BE HERMETICALLY SEALED IN A METAL CASE.
   - D. PERFORMANCE SHALL BE IN ACCORDANCE WITH TABLE I. ALL MEASUREMENTS SHALL BE MADE AT 25 DEGREES CENTIGRADE. TESTS TO BE PERFORMED IN SEQUENCE, i.e., DIODE AND 2K RESISTOR FOR TEST NO. 2 ARE RETAINED FOR TEST NO. 3 AND NO. 4.
   - E. QUALITY ASSURANCE PROVISIONS SHALL BE IN ACCORDANCE WITH NASA DOCUMENT ND 1015404 SECTION
   - F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH MIL-S-19491.
2. EXPLANATORY NOTES FOR SCHEMATIC:
   - A. R* IS THE EMITTER DEGENERATION REQUIRED TO BALANCE THE D.C. COLLECTOR VOLTAGES OF T_1 AND T_2 AND TO GET THE REQUIRED DIFFERENTIAL GAIN.
   - B. V_Y IS ADJUSTABLE TO SET SENSING THRESHOLD. $-6V \leq V_Y \leq -4V$
   - C. AN EXTERNAL RESISTOR MIGHT BE ADDED AT THIS POINT TO MATCH SENSE AMPLIFIERS IF ANALYSIS SHOWS IT TO BE NECESSARY.
   - D. VZ AND ITS ACCOMPANYING 100 Ω RESISTORS MAY NOT BE USED ON SOME SENSE AMPLIFIERS WHICH MAY BE TRANSFORMER COUPLED.

TABLE 1.

NO.	PARAMETER	TEST CONDITIONS	LIMITS
1.	V_{T3E}		0.7V ± 15%
2.	V_{T4E}	$I_1 = I_2 = 0$. VARIABLE POWER SUPPLY FROM T_{4E} TO GND. 2K Ω IN SERIES WITH FORWARD BIASED SILICON DIODE FROM T_{4C} TO GND.	MEAS. MAX V_{T4E}. REQUIRED FOR $(V_{T4C} - V_{T4E}) < 1.5V$.
3.	TRANSF. FCN	A. USING A TRANSFORMER INPUT, SUPPLY A 1 MC SINE WAVE DIFFERENTIAL INPUT OF 30,50 AND 70 MV. SET V_{T4E} FOR ZERO OUTPUT IN EACH CASE. B. INCREASE INPUT BY 10 MV FOR EACH CASE.	A. MEAS. MIN. V_{T4E} FOR ZERO OUTPUT WITH 30, 50, 70 MV INPUTS. B. MEAS. + & - PEAK CURRENTS. THESE SHOULD BALANCE TO WITHIN 30%. OUTPUT VOLTAGE MAGNITUDE SHOULD BE >2V. PEAK TO ZERO. THEN MEAS. MIN. V_{T4E} FOR ZERO OUTPUT AT THIS INPUT LEVEL. C. PLOT V_{T4E} VS. V_{IN}. SLOP SHOULD BE 30 ± 10%.
4.	CM REJECTION	SET V_{T4E} TO VOLTAGE MEAS. IN #3 FOR 30 MV. TIE I_1 AND I_2 INPUTS TOGETHER TO 1 MC SINE WAVE SOURCE THRU 0.001 UF. AMPLITUDE AT SOURCE SHOULD BE 2V PEAK TO PEAK.	NO OUTPUT (V_{T4C} IS GREATER THAN -1 V.)

NOTES: CONTINUED

3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
4. PADS ARE TO BE PROVIDED AT RESISTOR ENDS IN CLOSE PROXIMITY TO THE BASE PADS SUCH THAT THE OPERATOR OF THE THERMO COMPRESSION BONDER MAY CHOSE TO CONNECT THE RESISTORS TO THE BASE LEADS OR NOT, AS SPECIFIED.
5. QUAL. TESTING SHALL BE IN ACCORDANCE WITH N.D.

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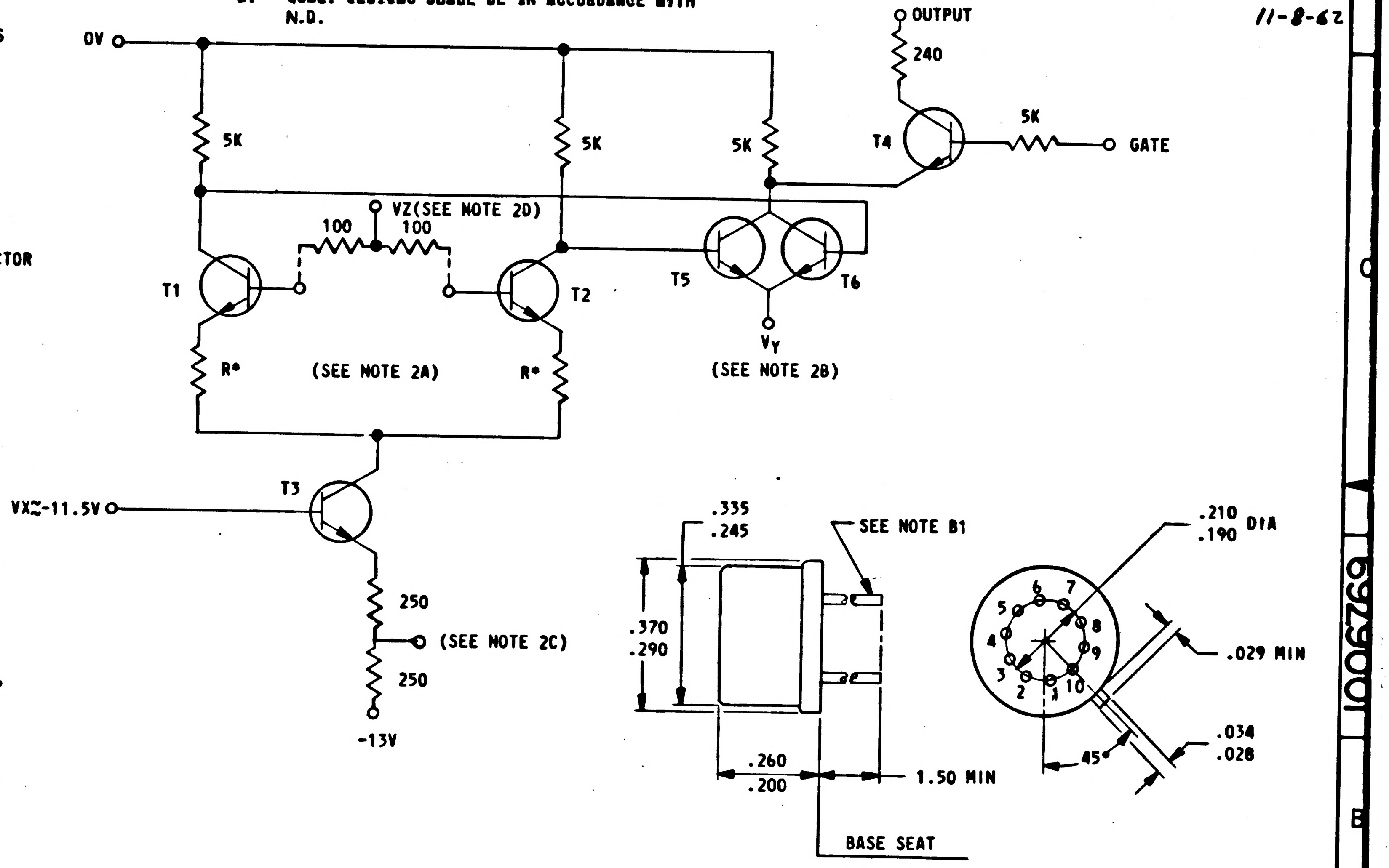
CLASS B RELEASE TDR No. 00085 DATE 11-8-62



INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

ORIGINAL SOURCE OF SUPPLY:

PER QUALIFIED VENDOR LIST
SEE ND

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray W Wheeler DATE 5 Nov 62
CHECKED [illegible] Maynard 6 Nov '62
APPROVAL [illegible] 7 Nov '62
APPROVAL Elden C Hall 7 Nov '62
NASA APPROVAL [illegible] 11-8-62
MIT APPROVAL [illegible] 11/8/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, SENSE AMPLIFIER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
10001	C	1006769
SCALE NONE	WT	SHEET 1 OF 1

1006769

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A	1006771	Ⓜ

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM DRAWING NO. C-88794-B	7-19-62	
A	REVISED PER TDRR 00064	10-5-62	10/11/62

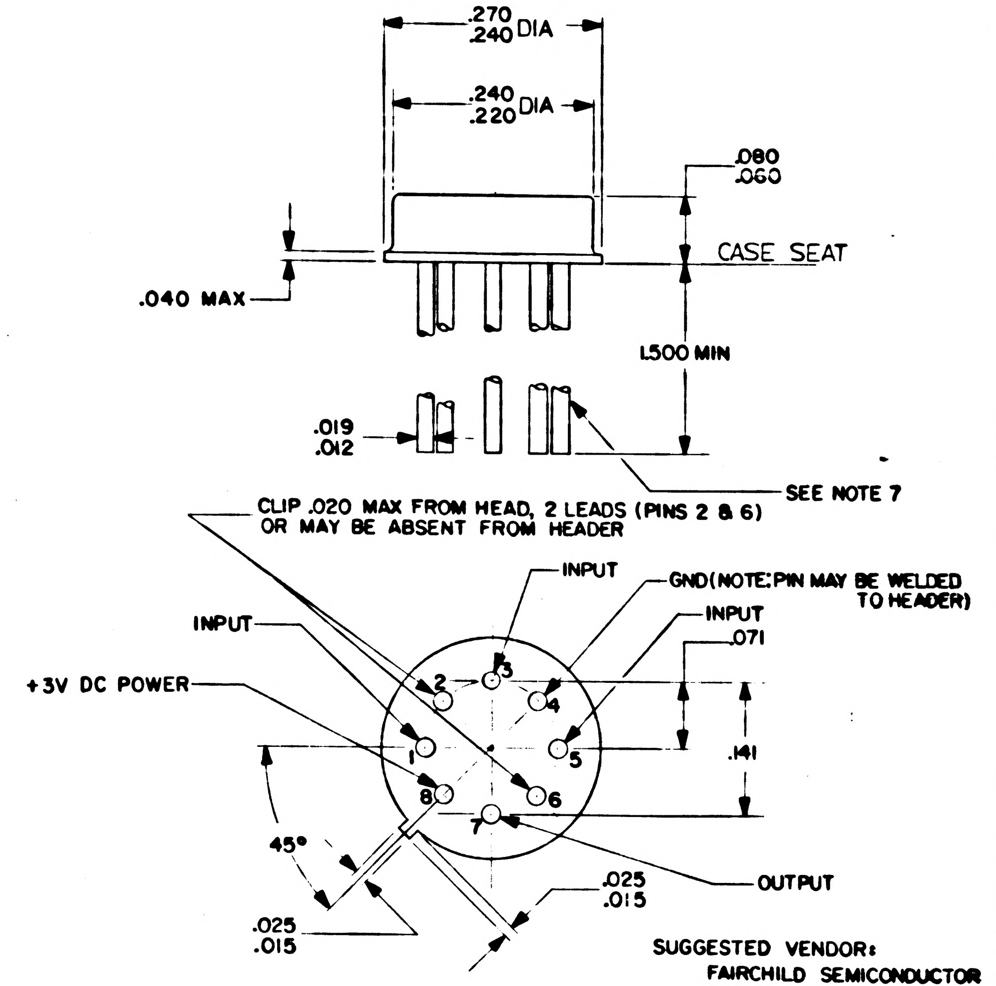
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050 AND .250 FROM THE CASE SEAT. BETWEEN .250 AND THE END OF LEAD A MAXIMUM OF .021 IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.
3. MAXIMUM DIAMETER LEADS AT A GAGING PLANE .054 $\pm^{.001}_{.000}$ BELOW CASE SEAT TO BE WITHIN .007 OF THEIR TRUE LOCATION RELATIVE TO MAX. WIDTH TAB AND TO THE MAXIMUM .270 DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
4. INDEX TAB FOR VISUAL ORIENTATION ONLY.
5. MEASURED FROM MAX. DIAMETER OF THE ACTUAL DEVICE.
6. LEAD MAT'L ND1002001
2. PIN 4 ELECTRICALLY CONNECTED TO CASE

DESIGN PARAMETERS 25 ± 1°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITIONS AT PINS						MIN	MAX
	1	3	4	5	7	8		
BASE CURRENT I_1	.785V	.790V	GND	.790V		3V		.680 ma
BASE CURRENT I_2	.790V	.785V		.790V				.680 ma
BASE CURRENT I_3	.790V	.790V		.785V				.680 ma
OUTPUT VOLTAGE PIN 7	.785V	OPEN		OPEN	Vo			.400V
OUTPUT VOLTAGE PIN 7	OPEN	.785V		OPEN	Vo			.400V
OUTPUT VOLTAGE PIN 7	OPEN	OPEN		.785V	Vo			.400V
OUTPUT CURRENT AT PIN 7	.540V	.540V		.540V	.785V		3.40 ma	
SATURATION VOLTAGE	1.20V	OPEN		OPEN	Vs			.35V
SATURATION VOLTAGE	OPEN	1.20V		OPEN	Vs			.35V
SATURATION VOLTAGE	OPEN	OPEN		1.20V	Vs			.35V
LEAKAGE CURRENT	OPEN	OPEN		OPEN	6V			100 MICRO AMPS
EMITTER BASE REVERSE CURRENT IEBO	GND	GND	6.5V	GND	OPEN	OPEN		1 ma
COLLECTOR CUTOFF CURRENT	GND	GND	OPEN	GND	10	OPEN		1 ma

MAXIMUM RATINGS AT 25°C	
MAXIMUM VOLTAGE TO PIN 8	+15.0 VOLTS
MAXIMUM VOLTAGE APPLIED TO ANY INPUT PIN	±4.0 VOLTS
STORAGE TEMPERATURE	-65°C TO +200°C
OPERATING TEMPERATURE	0 TO 70°C
MAXIMUM AVERAGE PROPAGATION DELAY	35n SEC
FAN OUT OF 5 WITH FAN IN OF 3 FROM	0 TO 70°C



SUGGESTED VENDOR:
FAIRCHILD SEMICONDUCTOR
P/N SL 1015

BOTTOM VIEW

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9-13-62

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-19-62
CHECKED Joe Marton
APPROVAL W B Turner
APPROVAL Eldon C Hall

NASA APPROVAL 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO-NOR GATE (TO 47 SIZE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006771
SCALE NONE	WT —	SHEET 1 OF 1

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B 1006771

SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM DRAWING NO. C-88794-B	7-19-62	
A	REVISED PER TDRR 00064	10-5-62	10/11/62
B	REVISED PER TDRR 00081	102362	WK 10/31/62

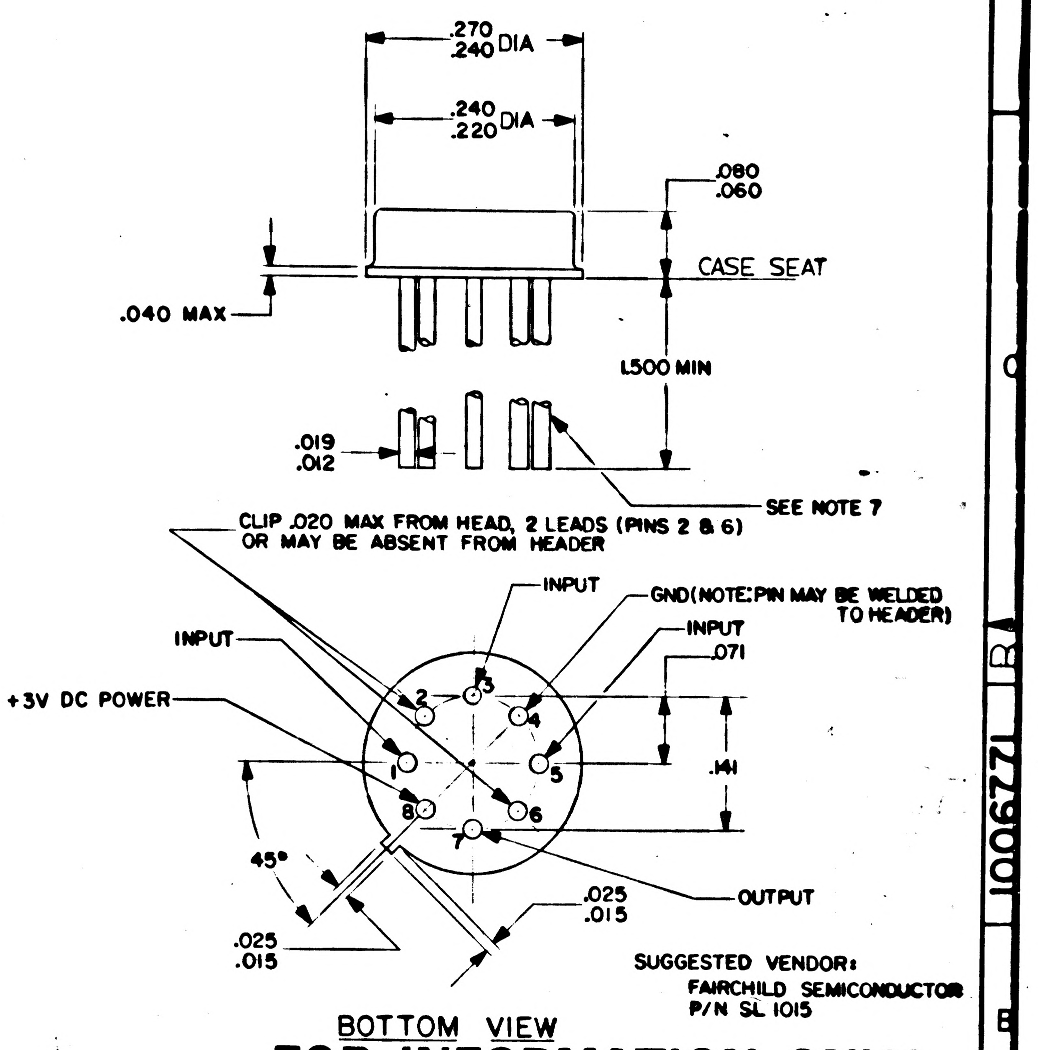
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050 AND .250 FROM THE CASE SEAT. BETWEEN .250 AND THE END OF LEAD A MAXIMUM OF .021 IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.
3. MAXIMUM DIAMETER LEADS AT A GAGING PLANE .054 $\pm\begin{smallmatrix}.001\\.000\end{smallmatrix}$ BELOW CASE SEAT TO BE WITHIN .007 OF THEIR TRUE LOCATION RELATIVE TO MAX. WIDTH TAB AND TO THE MAXIMUM .270 DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
4. INDEX TAB FOR VISUAL ORIENTATION ONLY.
5. MEASURED FROM MAX. DIAMETER OF THE ACTUAL DEVICE.
6. LEAD MAT'L ND1002001
7. PIN 4 ELECTRICALLY CONNECTED TO CASE

DESIGN PARAMETERS 25 ± 2°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITIONS AT PINS						MIN	MAX
	1	3	4	5	7	8		
BASE CURRENT I_1	.785V	.790V	GND	.790V		+3.0V		.680 ma
BASE CURRENT I_2	.790V	.785V		.790V				.680 ma
BASE CURRENT I_3	.790V	.790V		.785V				.680 ma
OUTPUT VOLTAGE PIN 7	.785V	OPEN		OPEN	Vo			.400V
OUTPUT VOLTAGE PIN 7	OPEN	.785V		OPEN	Vo			.400V
OUTPUT VOLTAGE PIN 7	OPEN	OPEN		.785V	Vo			.400V
OUTPUT CURRENT AT PIN 7	.540V	.540V		.540V	.785V		3.40 ma	
SATURATION VOLTAGE	1.20V	OPEN		OPEN	Vs			.35V
SATURATION VOLTAGE	OPEN	1.20V		OPEN	Vs			.35V
SATURATION VOLTAGE	OPEN	OPEN		1.20V	Vs			.35V
LEAKAGE CURRENT I_{CEO}	OPEN	OPEN	GND	OPEN	5.0V	+3.0V		100 MICRO AMPS
EMITTER BASE REVERSE CURRENT I_{EBO}	GND	GND	6.5V	GND	OPEN	OPEN		1 ma
COLLECTOR CUTOFF CURRENT I_{CBO}	GND	GND	OPEN	GND	8.0V	OPEN		1 ma

MAXIMUM RATINGS AT 25°C	
MAXIMUM VOLTAGE TO PIN 8	+15.0 VOLTS
MAXIMUM VOLTAGE APPLIED TO ANY INPUT PIN	±4.0 VOLTS
STORAGE TEMPERATURE	-65°C TO +200°C
OPERATING TEMPERATURE	0 TO 70°C
MAXIMUM AVERAGE PROPAGATION DELAY	35n SEC
FAN OUT OF 5 WITH FAN IN OF 3	0 TO 70°C



SUGGESTED VENDOR:
FAIRCHILD SEMICONDUCTOR
P/N SL 1015

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9-13-62

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. CHIN DATE 7-19-62
CHECKED Joe Marton
APPROVAL W B Turner
APPROVAL Eldon C Hall
NASA APPROVAL 9-13-62
MIT APPROVAL 9/13/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO-NOR GATE
(TO 47 SIZE)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE NONE
WT —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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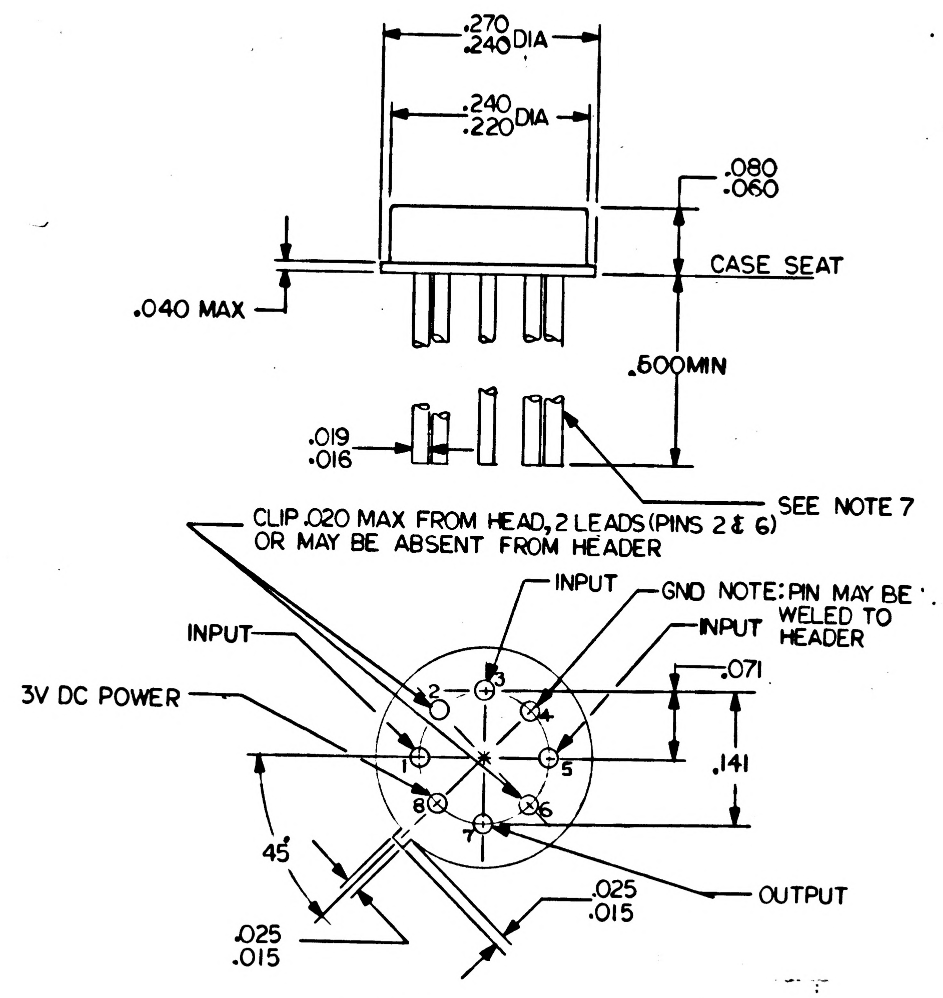
C 1006771

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM DRAWING C-P8794-B	7-19-62	
A	REVISED PER TDRR 00064	10-5-62	
B	REVISED PER TDRR 00081	10.23.62	
C	REVISED & REDRAWN PER TDRRR 00190	12-20-62	WK

GENERAL REQUIREMENTS:

1. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500 FOR MATERIALS, QUALITY & WORKMANSHIP.
2. THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050 AND .250 FROM THE CASE SEAT. BETWEEN .250 AND THE END OF LEAD A MAXIMUM OF .021 IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.
3. MAXIMUM DIAMETER LEADS AT A GAGING PLANE $.054 \pm {}^{.001}_{.000}$ BELOW CASE SEAT TO BE WITHIN .007 OF THEIR TRUE LOCATION RELATIVE TO MAX. WIDTH TAB AND TO THE MAXIMUM .270 DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
4. INDEX TAB FOR VISUAL ORIENTATION ONLY.
5. MEASURED FROM MAX. DIAMETER OF THE ACTUAL DEVICE.
6. LEAD MATERIAL: GOLD PLATED IRON-NICKEL-COBOTT-ALLOY IN ACCORDANCE WITH ND1015402.
7. PIN 4 ELECTRICALLY CONNECTED TO CASE.
8. D C RESISTANCE BETWEEN PIN 7 & 8 SHALL BE 510 OHMS MIN.
9. AVERAGE PROPAGATION DELAY SHALL BE 50 NANOSECONDS AND SHALL BE MEASURED AS ILLUSTRATED ON SHEET2.
10. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
11. UNIT SHALL BE ELECTRICALLY TESTED IN ACCORDANCE WITH TABLE I.



BOTTOM VIEW

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/13/62

REV C	REV C
REV B	——
REV A	——
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + —//— DECIMALS ± —//— ANGLES ± —//—
DO NOT SCALE THIS DRAWING
MATERIAL —//—
HEAT TREATMENT —//—
FINAL FINISH —//—

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN Louis A. [illegible] DATE 12-19-62
CHECKED George J. Kre[illegible] 20 Dec 62
APPROVAL [illegible] 20 Dec 62
APPROVAL E C Hall 20 Dec 62

NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL W. A. Kupfer 20 Dec 62

MICRO NOR GATE
(TO 47 SIZE)
SPECIFICATION CONTROL DWG.

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE —//— WT —//— SHEET 1 OF 2

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN PER TDRR 00190 SHEET 2 ADDED	20 Dec 62	WK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/13/62

TABLE I

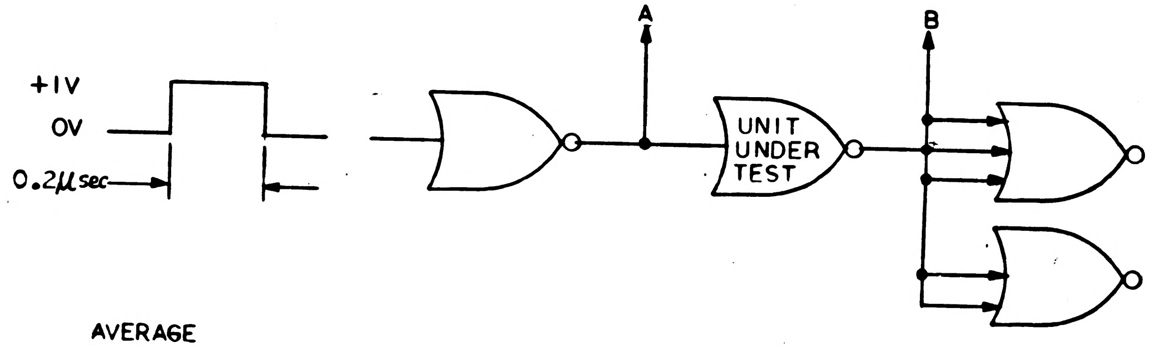
DESIGN PARAMETERS 25±1°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

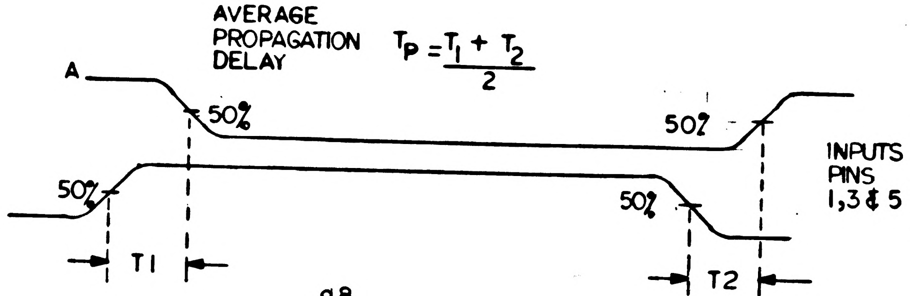
PARAMETER	CONDITIONS AT PINS						MIN	MAX
	1	3	4	5	7	8		
BASE CURRENT I_1	785±2MV	785±10MV	GND	785±10MV		+3.0V		.680 ma
BASE CURRENT I_2	785±10MV	785±2MV	↑	785±10MV		↑		.680 ma
BASE CURRENT I_3	785±10MV	785±10MV		785±2MV				.680 ma
OUTPUT VOLTAGE PIN 7	785±2MV	OPEN		OPEN	Vo			.400V
OUTPUT VOLTAGE PIN 7	OPEN	785±2MV		OPEN	Vo			.400V
OUTPUT VOLTAGE PIN 7	OPEN	OPEN		785±2MV	Vo			.400V
OUTPUT CURRENT AT PIN 7	540±2MV	540±2MV		540±2MV	785MV		3.40 ma	
SATURATION VOLTAGE	1.20V±10MV	OPEN		OPEN	Vs			.35V
SATURATION VOLTAGE	OPEN	1.20V±10MV		OPEN	Vs			.35V
SATURATION VOLTAGE	OPEN	OPEN	↓	1.20V±10MV	Vs	↓ +3.0V		.35V
LEAKAGE CURRENT ICEO	OPEN	OPEN	GND	OPEN	5.0V	OPEN		100 MICRO AMPS
EMITTER BASE REVERSE CURRENT IEBO	GND	GND	5.0V	GND	OPEN	OPEN		1 ma
COLLECTOR CUTOFF CURRENT ICBO	GND	GND	OPEN	GND	8.0V	OPEN		1 ma

TABLE II

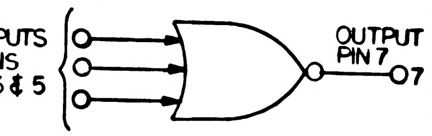
MAXIMUM RATINGS AT 25°C

MAXIMUM VOLTAGE TO PIN 8	+8.0 VOLTS
MAXIMUM VOLTAGE APPLIED TO ANY INPUT PIN	±4.0 VOLTS
STORAGE TEMPERATURE	-65°C TO + 200°C
OPERATING TEMPERATURE	0 TO 70°C
FAN OUT OF 5 WITH FAN IN OF 3	0 TO 70°C
NOMINAL DISSIPATED POWER PER UNIT	15 MW

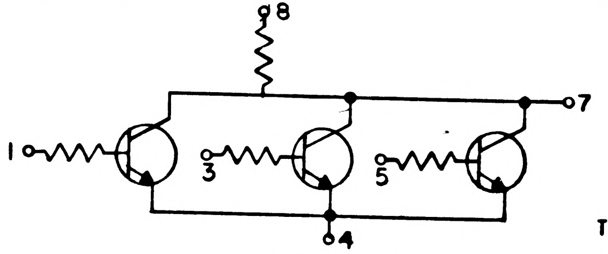




$T_P = \frac{T_1 + T_2}{2}$



LOGIC SYMBOL



THIS SHEET ADDED REV C

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —//— DECIMALS ± —//— ANGLES ± —//—
DO NOT SCALE THIS DRAWING
MATERIAL —//—
HEAT TREATMENT —//—
FINAL FINISH —//—

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN DATE 12-1962
CHECKED George J Ruiz 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL C Hall 20 Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO-NOR GATE
(TO 47 SIZE)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE NONE
WT —//—
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

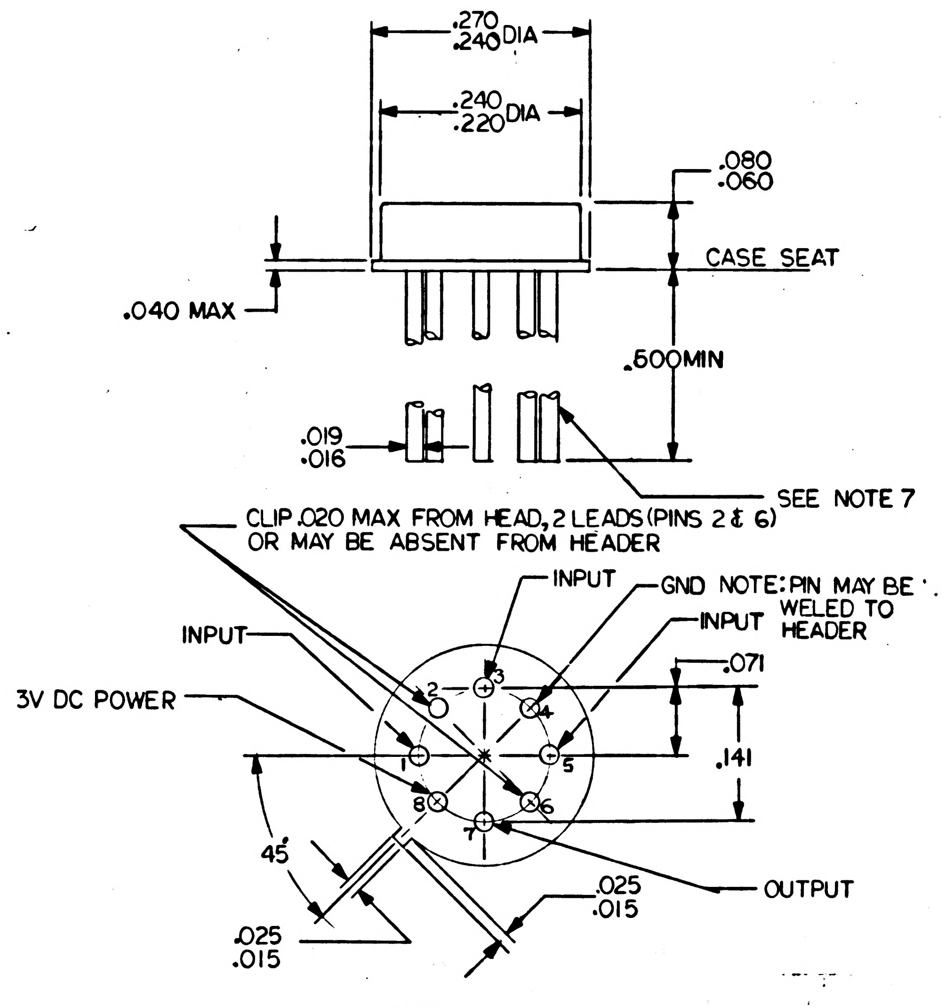
D | 1006771

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM DRAWING C-P8794B	7-19-62	
A	REVISED PER TDRR 00064	10-5-62	
B	REVISED PER TDRR 000 81	10.23.62	
Ⓜ C	REVISED & REDRAWN PER TDRRR 00190	12-20-62	WK
D	ADDED PROCUREMENT NOTE 12 PER TDRR 00445	2-20-63	ECH. WK.

GENERAL REQUIREMENTS:

1. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500 FOR MATERIALS, QUALITY & WORKMANSHIP.
2. THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050 AND .250 FROM THE CASE SEAT. BETWEEN .250 AND THE END OF LEAD A MAXIMUM OF .021 IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.
3. MAXIMUM DIAMETER LEADS AT A GAGING PLANE $.054 \pm {}^{.001}_{.000}$ BELOW CASE SEAT TO BE WITHIN .007 OF THEIR TRUE LOCATION RELATIVE TO MAX. WIDTH TAB AND TO THE MAXIMUM .270 DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
4. INDEX TAB FOR VISUAL ORIENTATION ONLY.
5. MEASURED FROM MAX. DIAMETER OF THE ACTUAL DEVICE.
6. LEAD MATERIAL: GOLD PLATED IRON-NICKEL-COBOTT-ALLOY IN ACCORDANCE WITH ND1015402.
7. PIN 4 ELECTRICALLY CONNECTED TO CASE.
8. D C RESISTANCE BETWEEN PIN 7 & 8 SHALL BE 530 OHMS MIN.
9. AVERAGE PROPAGATION DELAY SHALL BE 35 NANOSECONDS MAX. AND SHALL BE MEASURED AS ILLUSTRATED ON SHEET 2.
10. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
11. UNIT SHALL BE ELECTRICALLY TESTED IN ACCORDANCE WITH TABLE I.
12.
    - A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
    - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER D BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
    - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER D.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.



BOTTOM VIEW

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/13/62

REV D	REV D
REV C	REV C
REV B	—
REV A	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± -//- DECIMALS ± -//- ANGLES ± -//-
DO NOT SCALE THIS DRAWING
MATERIAL -//-
HEAT TREATMENT -//-
FINAL FINISH -//-

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Louis Alonso DATE 12-19-62
CHECKED George J Pries 20 Dec 62
APPROVAL D. Pleger 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL W S Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO NOR GATE
(TO 47 SIZE)
SPECIFICATION CONTROL DWG.

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006771

SCALE -//- WT -//- SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D 1006771 (M)

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN PER TDRR SHEET 2 ADDED 00190	20 Dec 62	WK
D	REVISED PER TDRR 00445	2-20-63	ECH WK.

TABLE I

DESIGN PARAMETERS 25±1°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

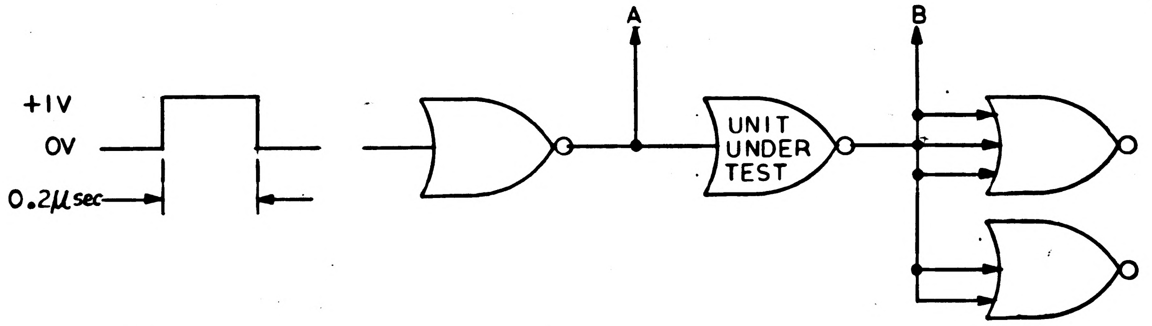
PARAMETER	CONDITIONS AT PINS 1	3	4	5	7	8	MIN	MAX
BASE CURRENT I_1	785±2MV	785±10MV	GND	785±10MV		+3.0V		.350 ma
BASE CURRENT I_2	785±10MV	785±2MV	↕	785±10MV		↕		.350 ma
BASE CURRENT I_3	785±10MV	785±10MV	↕	785±2MV		↕		.350 ma
OUTPUT VOLTAGE PIN 7	785±2MV	OPEN	↕	OPEN	Vo	↕		.350V
OUTPUT VOLTAGE PIN 7	OPEN	785±2MV	↕	OPEN	Vo	↕		.350V
OUTPUT VOLTAGE PIN 7	OPEN	OPEN	↕	785±2MV	Vo	↕		.350V
OUTPUT CURRENT AT PIN 7	540±2MV	540±2MV	↕	540±2MV	785MV	↕	3.00 ma	
SATURATION VOLTAGE	1.20V±10MV	OPEN	↕	OPEN	Vs	↕		.300V
SATURATION VOLTAGE	OPEN	1.20V±10MV	↕	OPEN	Vs	↕		.300V
SATURATION VOLTAGE	OPEN	OPEN	↕	1.20V±10MV	Vs	+3.0V		.300V
LEAKAGE CURRENT ICEO	OPEN	OPEN	GND	OPEN	5.0V	OPEN		100 MICRO AMPS
EMITTER BASE REVERSE CURRENT IEBO	GND	GND	5.0V	GND	OPEN	OPEN		1 ma
COLLECTOR CUTOFF CURRENT ICBO	GND	GND	OPEN	GND	8.0V	OPEN		1 ma

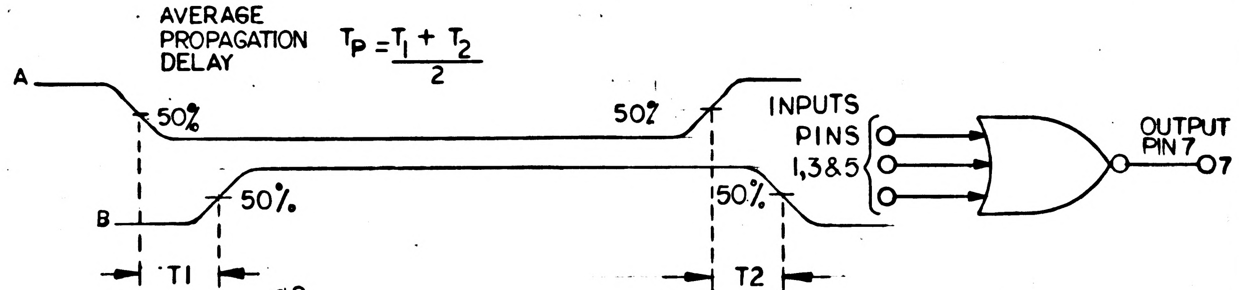
TABLE II
MAXIMUM RATINGS AT 25°C

MAXIMUM VOLTAGE TO PIN 8	+8.0 VOLTS
MAXIMUM VOLTAGE APPLIED TO ANY INPUT PIN	±4.0 VOLTS
STORAGE TEMPERATURE	-65°C TO + 200°C
OPERATING TEMPERATURE	0 TO 70°C
FAN OUT OF 5 WITH FAN IN OF 3	0 TO 70°C
NOMINAL DISSIPATED POWER PER UNIT	15 MW

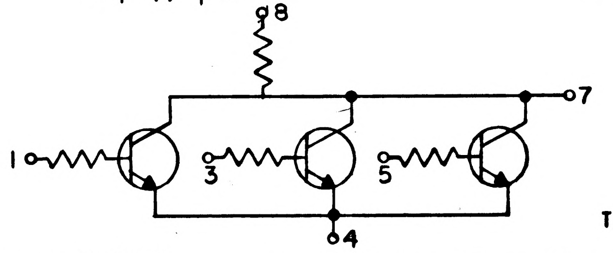
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/13/62





LOGIC SYMBOL



THIS SHEET ADDED REV C

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Leo S. Laul DATE 12-1962
CHECKED George J. Reis 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO-NOR GATE (TO 47 SIZE)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE NONE
WT —
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

E 1006771

SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM DRAWING C-P8794B	7-19-62	
A	REVISED PER TDRR 00064	10-5-62	
B	REVISED PER TDRR 00081	10.23.62	
C	REVISED & REDRAWN PER TDRRR 00190	12-20-62	WK
D	ADDED PROCUREMENT NOTE 12 PER TDRR 00445	2-20-63	ECH. WK.
E	REPLACED WITH CHANGE BY REV F PER TDRR 00513		WK

(M)
(H)

GENERAL REQUIREMENTS:

1. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500 FOR MATERIALS, QUALITY & WORKMANSHIP.

2. THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050 AND .250 FROM THE CASE SEAT. BETWEEN .250 AND THE END OF LEAD A MAXIMUM OF .021 IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.

3. MAXIMUM DIAMETER LEADS AT A GAGING PLANE .054$^{+.001}_{-.000}$ BELOW CASE SEAT TO BE WITHIN .007 OF THEIR TRUE LOCATION RELATIVE TO MAX. WIDTH TAB AND TO THE MAXIMUM .270 DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.

4. INDEX TAB FOR VISUAL ORIENTATION ONLY.

5. MEASURED FROM MAX. DIAMETER OF THE ACTUAL DEVICE.

6. LEAD MATERIAL: GOLD PLATED IRON-NICKEL-COBOTT-ALLOY IN ACCORDANCE WITH ND1015402.

7. PIN 4 ELECTRICALLY CONNECTED TO CASE.

8. D C RESISTANCE BETWEEN PIN 7 & 8 SHALL BE 530 OHMS MIN.

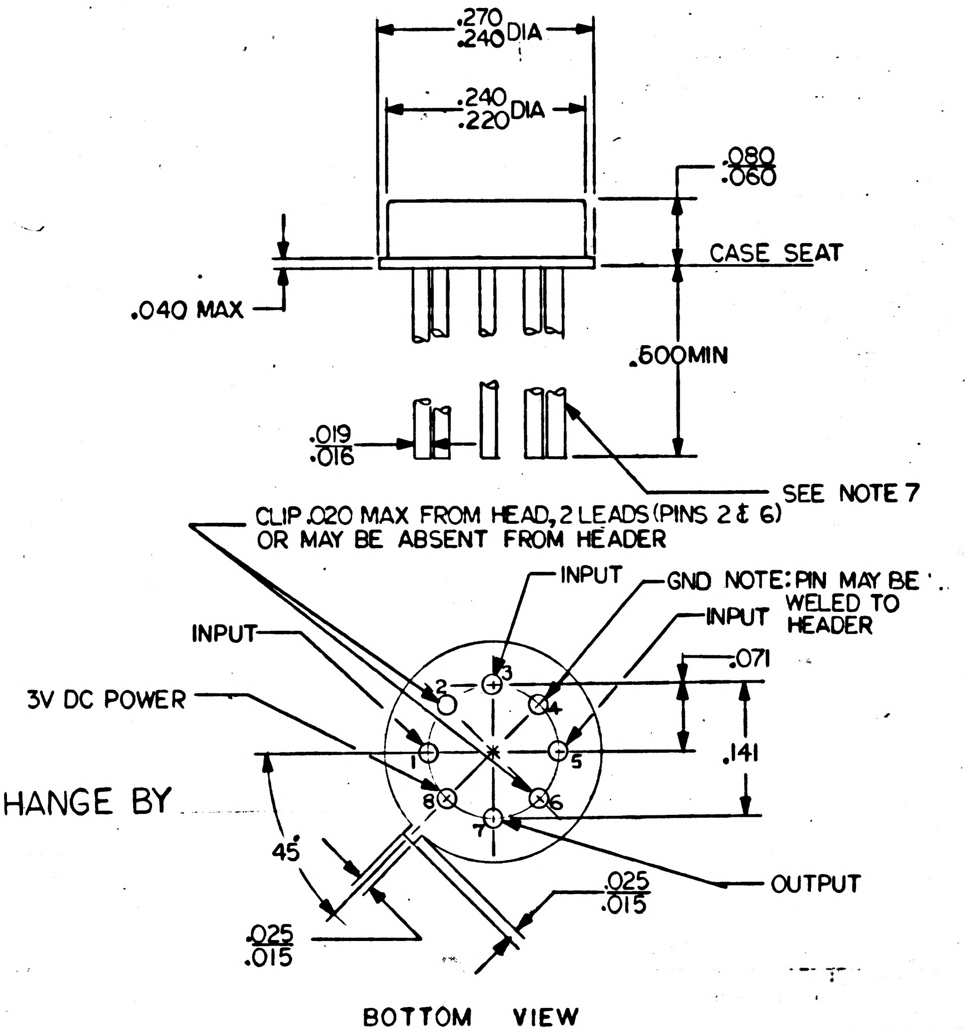
9. AVERAGE PROPAGATION DELAY SHALL BE 35 NANOSECONDS MAX. AND SHALL BE MEASURED AS ILLUSTRATED ON SHEET 2.

10. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

11. UNIT SHALL BE ELECTRICALLY TESTED IN ACCORDANCE WITH TABLE I.

12. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC & PHYSICAL DIMENSIONS.
    B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER D BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
    C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER D.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.



(E) REPLACED WITH CHANGE BY REV F

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/13/62

REVE	REVD
REV D	REV D
REV C	REV C
REV B	—
REV A	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN DATE 12-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO NOR GATE
(TO 47 SIZE)
SPECIFICATION CONTROL DWG.

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE —
WT —
SHEET 1 OF 2

1006771 E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D 1006771 (M)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN PER TDRR SHEET 2 ADDED 00190	20 Dec 62	WK
D	REVISED PER TDRR 00445	2-20-63	EC WK.
E	REPLACED BY REV H WITH CHANGES PER TDRR 00562	3-13-63	WK

TABLE I

DESIGN PARAMETERS 25±1°C AMBIENT (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITIONS AT PINS						MIN	MAX
	1	3	4	5	7	8		
BASE CURRENT I_1	785±2MV	785±10MV	GND	785±10MV		+3.0V		.350 ma
BASE CURRENT I_2	785±10MV	785±2MV		785±10MV				.350 ma
BASE CURRENT I_3	785±10MV	785±10MV		785±2MV				.350 ma
OUTPUT VOLTAGE PIN 7	785±2MV	OPEN		OPEN	Vo			.350V
OUTPUT VOLTAGE PIN 7	OPEN	785±2MV		OPEN	Vo			.350V
OUTPUT VOLTAGE PIN 7	OPEN	OPEN		785±2MV	Vo			.350V
OUTPUT CURRENT AT PIN 7	540±2MV	540±2MV		540±2MV	785MV		3.00 ma	
SATURATION VOLTAGE	1.20V±10MV	OPEN		OPEN	Vs			.300V
SATURATION VOLTAGE	OPEN	1.20V±10MV		OPEN	Vs			.300V
SATURATION VOLTAGE	OPEN	OPEN		1.20V±10MV	Vs	+3.0V		.300V
LEAKAGE CURRENT ICEO	OPEN	OPEN	GND	OPEN	5.0V	OPEN		100 MICRO AMPS
EMITTER BASE REVERSE CURRENT IEBO	GND	GND	5.0V	GND	OPEN	OPEN		1 ma
COLLECTOR CUTOFF CURRENT ICBO	GND	GND	OPEN	GND	8.0V	OPEN		1 ma

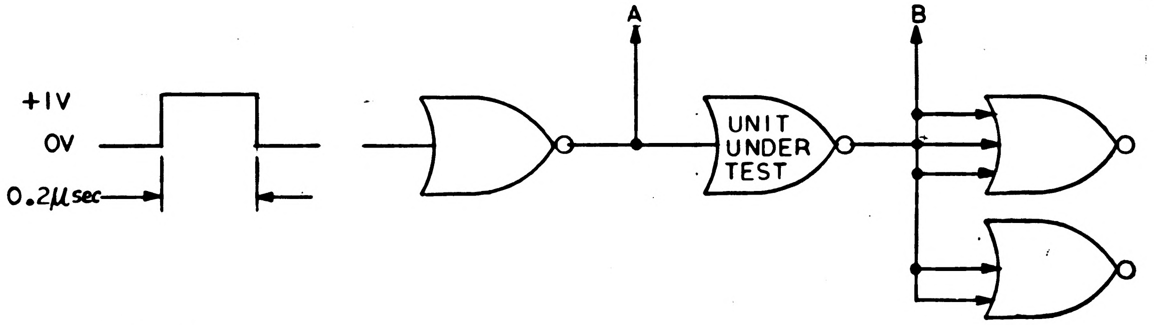
TABLE II

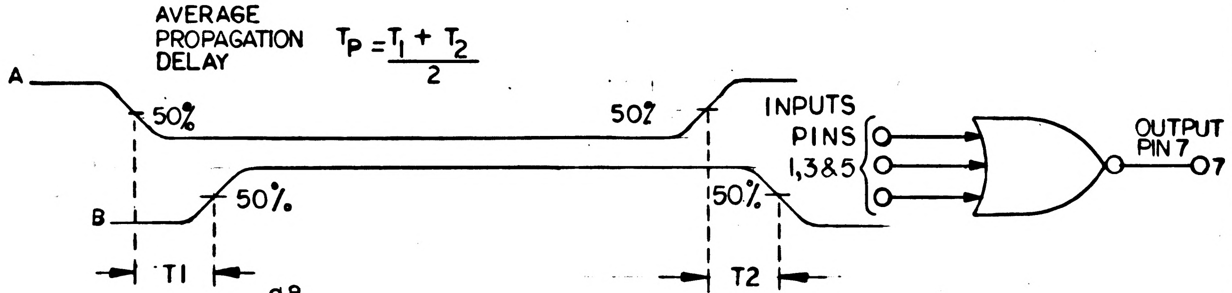
MAXIMUM RATINGS AT 25°C

MAXIMUM VOLTAGE TO PIN 8	+8.0 VOLTS
MAXIMUM VOLTAGE APPLIED TO ANY INPUT PIN	±4.0 VOLTS
STORAGE TEMPERATURE	-65°C TO + 200°C
OPERATING TEMPERATURE	0 TO 70°C
FAN OUT OF 5 WITH FAN IN OF 3	0 TO 70°C
NOMINAL DISSIPATED POWER PER UNIT	15 MW

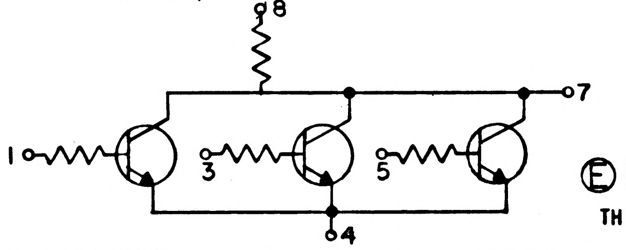
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/12/62





LOGIC SYMBOL



(E) REPLACED BY REV H WITH CHANGE

THIS SHEET ADDED REV C

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [illegible] DATE 12-1962
CHECKED George J. [illegible] 20 Dec 62
APPROVAL [illegible] 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO-NOR GATE (TO 47 SIZE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE NONE
WT —
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

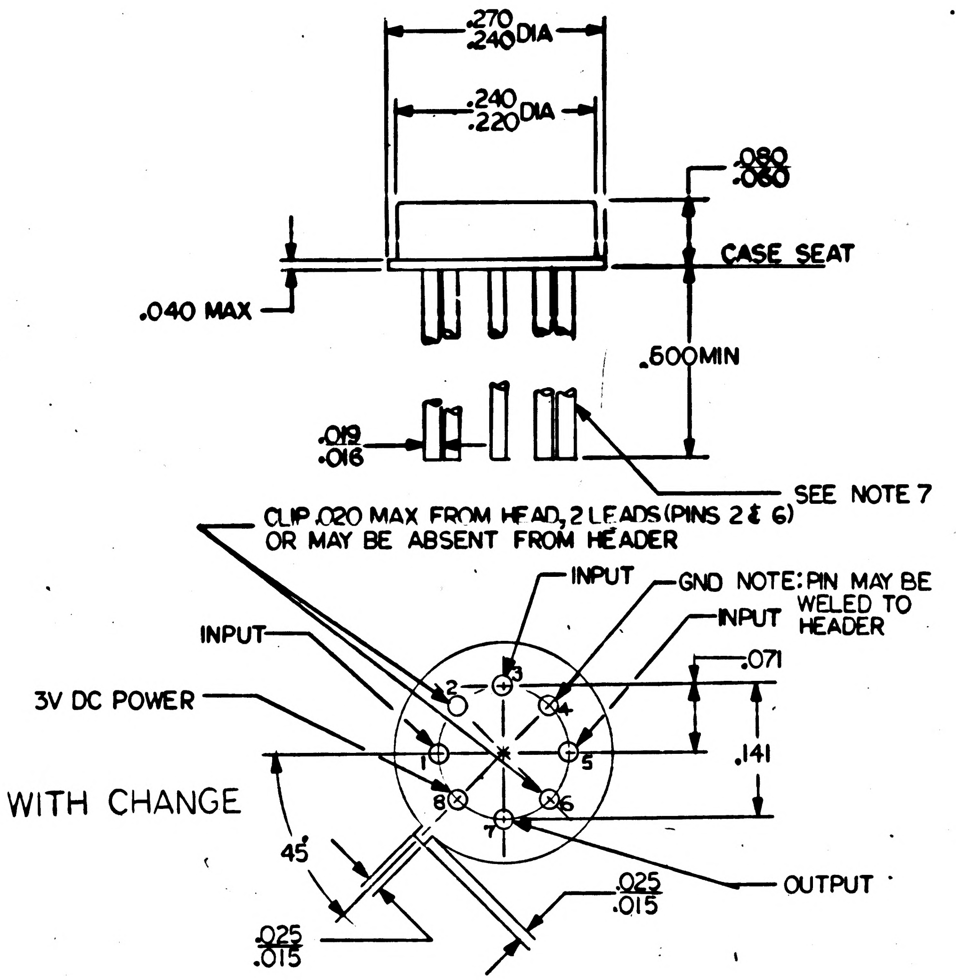
F	1006771

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGE PER TDRR 00513		WR

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

GENERAL REQUIREMENTS:

1. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500 FOR MATERIALS, QUALITY & WORKMANSHIP.
2. THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050 AND .250 FROM THE CASE SEAT. BETWEEN .250 AND THE END OF LEAD A MAXIMUM OF .021 IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.
3. MAXIMUM DIAMETER LEADS AT A GAGING PLANE .054± $^{.001}_{.000}$ BELOW CASE SEAT TO BE WITHIN .007 OF THEIR TRUE LOCATION RELATIVE TO MAX. WIDTH TAB AND TO THE MAXIMUM .270 DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
4. INDEX TAB FOR VISUAL ORIENTATION ONLY.
5. MEASURED FROM MAX. DIAMETER OF THE ACTUAL DEVICE.
6. LEAD MATERIAL: GOLD PLATED IRON-NICKEL-COBOTT-ALLOY IN ACCORDANCE WITH ND1015402.
7. PIN 4 ELECTRICALLY CONNECTED TO CASE.
8. D C RESISTANCE BETWEEN PIN 7 & 8 SHALL BE 530 OHMS MIN.
9. AVERAGE PROPAGATION DELAY SHALL BE 35 NANOSECONDS MAX. AND SHALL BE MEASURED AS ILLUSTRATED ON SHEET 2.
10. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
11. UNIT SHALL BE ELECTRICALLY TESTED IN ACCORDANCE WITH TABLE I.



BOTTOM VIEW

Ⓕ REPLACES REV E WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/13/62

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

REV F	REV D
REV D	REV D
REV C	REV C
REV B	—
REV A	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 12-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO NOR GATE (TO 47 SIZE)

SPECIFICATION CONTROL DWG.

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE —
WT —
SHEET 1 OF 2

MASTER

MASTER

1006771 F

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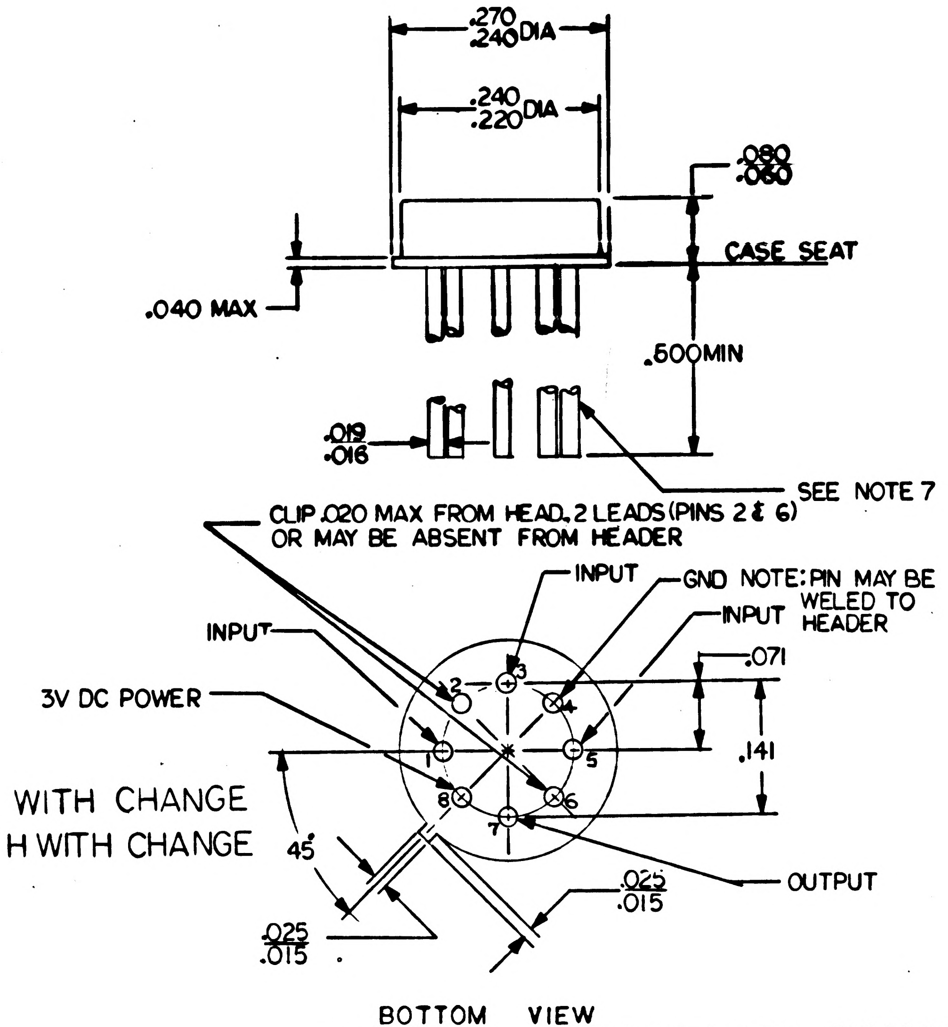
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
(17) F	REPLACES REVE WITH CHANGE PER TDRR 00513		WK
G	REPLACED BY REV H WITH CHANGES PER TDRR 00562	3-13-63	WK.

GENERAL REQUIREMENTS:

1. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500 FOR MATERIALS, QUALITY & WORKMANSHIP.
2. THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050 AND .250 FROM THE CASE SEAT. BETWEEN .250 AND THE END OF LEAD A MAXIMUM OF .021 IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.
3. MAXIMUM DIAMETER LEADS AT A GAGING PLANE $.054 \pm {}^{.001}_{.000}$ BELOW CASE SEAT TO BE WITHIN .007 OF THEIR TRUE LOCATION RELATIVE TO MAX. WIDTH TAB AND TO THE MAXIMUM .270 DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
4. INDEX TAB FOR VISUAL ORIENTATION ONLY.
5. MEASURED FROM MAX. DIAMETER OF THE ACTUAL DEVICE.
6. LEAD MATERIAL: GOLD PLATED IRON-NICKEL-COBOTT-ALLOY IN ACCORDANCE WITH ND1015402.
7. PIN 4 ELECTRICALLY CONNECTED TO CASE.
8. D C RESISTANCE BETWEEN PIN 7 & 8 SHALL BE 530 OHMS MIN.
9. AVERAGE PROPAGATION DELAY SHALL BE 35 NANOSECONDS MAX. AND SHALL BE MEASURED AS ILLUSTRATED ON SHEET 2.
10. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
11. UNIT SHALL BE ELECTRICALLY TESTED IN ACCORDANCE WITH TABLE I.

Ⓕ REPLACES REV E WITH CHANGE
Ⓖ REPLACED BY REV H WITH CHANGE



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00027 DATE 9/13/62

REV F	REV D
REV D	REV D
REV C	REV C
REV B	——
REV A	——
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± –//– DECIMALS ± –//– ANGLES ± –//–
DO NOT SCALE THIS DRAWING
MATERIAL –//–
HEAT TREATMENT –//–
FINAL FINISH –//–

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DRAWN DATE 12-19-62
CHECKED 20 Dec 62
APPROVAL 20 Dec 62
APPROVAL E C Hall 20 Dec 62
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO NOR GATE
(TO 47 SIZE)
SPECIFICATION CONTROL DWG.

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006771
SCALE –//– WT –//– SHEET 1 OF 2

MASTER

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H 1006771

SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 00562	3-13-63	WK

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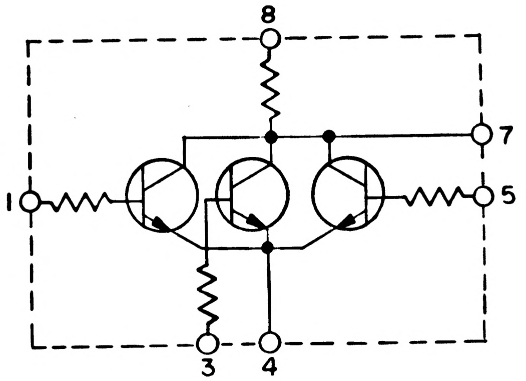
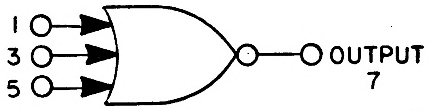
NOTES:

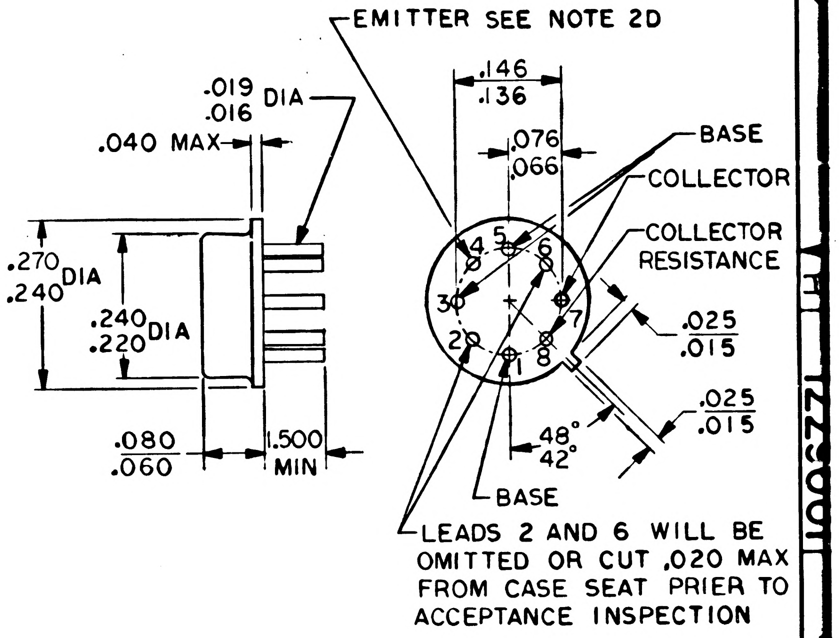
1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) VOLTAGE TO PIN 8: PLUS 10.0 VOLTS WITH RESPECT TO PIN 4.
     - (2) VOLTAGE APPLIED TO ANY INPUT PIN (1,3, OR 5): PLUS OR MINUS 4 VOLTS WITH RESPECT TO PIN 4.
     - (3) THERMAL RESISTANCE, JUNCTION-CASE, (θ_{JC}): 200°C/WATT.
     - (4) THERMAL RESISTANCE, JUNCTION-AMBIENT, (θ_{JA}): 500°C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -55°C TO +125°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +150°C.
     - (3) TEMPERATURE, SOLDERING LEADS: +250°C (1 MINUTE MAX).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130, WITH THE MANUFACTURER'S IDENTIFICATION, DATE CODE, AND THE NUMBER 771. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED, REF. JEDEC (TO-47) OUTLINE.
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. PIN 4 SHALL BE ELECTRICALLY CONNECTED TO THE CASE. PIN MAY BE WELDED TO HEADER.
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN. MAXIMUM NUMBER OF UNITS IN ANY LOT WILL BE 5000 UNITS.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL ELECTRICAL TESTS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 1/2 DEGREE CENTIGRADE.
   - C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.
     - (1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.
     - (2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.
     - (3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.
     - (4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2,3 AND 4 OF TABLE III. IN TABLE III ACCEPTABLE UNITS FROM SUBGROUP 2 AREUSED IN SUBGROUP 4.
     - (5) AFTER COMPLETION OF TESTS,UNITS USED IN SUBGROUP 3 OF TABLE III SHALL BE USED IN SUBGROUP 6 OF TABLE III.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.





LOGIC SYMBOL



Ⓗ REPLACES REV G WITH CHANGES

MASTER

H	H	H	H
SHEET 1	SHEET 2	SHEET 3	SHEET 4

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
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DWG. NO. CONTRACT
DRAWN R. Kane DATE 12 Mar 63
CHECKED L. D. Hanley
APPROVAL L. D. Hanley
APPROVAL 3/13/63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 March 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO-NOR GATE (TO 47 SIZE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE NONE WT SHEET 1 OF 4

INCHES
0 1 2
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H 1006771

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV E WITH CHANGES PER TDRR 00562	3-13-63	WK

NOTES (CONTINUED):

3. D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE: LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1×10^{-7} CC/ATM/SEC. A LEAKAGE RATE OF 1×10^{-6} CC/ATM/SEC OR GREATER SHALL CONSTITUE A FAILURE.

(4) AVERAGE PROPAGATION DELAY (T_P): MEASUREMENTS SHALL BE PERFORMED ON ANY ONE INPUT USING TEST CIRCUIT SPECIFIED IN FIGURE 1 MADE UP OF ACCEPTABLE UNITS WHERE $T_P = (T_1 + T_2)/2$. VOLTAGE PIN 8 TO PIN 4,3 V ± 10%.

(5) POWER BURN-IN: AN ODD NUMBER OF UNITS (GATES) SHALL BE CONNECTED IN SERIES WITH THE OUTPUT OF THE LAST UNIT SUPPLYING THE INPUT TO THE FIRST UNIT, THUS FORMING A "RING" AS SHOWN IN FIGURE 2. WHEN 8 V ± 5% DC IS APPLIED TO THE POWER TERMINALS OF ALL UNITS IN THE CIRCUIT ("RING"), OSCILLATION SHALL OCCUR AT THE INITIATION OF THE TEST.

(6) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

(7) THE UNITS WILL BE OPENED AND EXAMINED UNDER 80X MAGNIFICATION FOR DEFECTS IN THE METALIZED INTERCONNECTION PATTERNS WHICH ARE OR COULD BE DUE TO MECHANICAL ABRASION OR CHEMICAL REACTION WITH CONTAMINATE SUBSTANCES. DEFECTS IN THE METALIZATION WILL BE CAUSE FOR REJECTION.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 1.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+150°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
HIGH TEMPERATURE BAKE	TEMPERATURE = 150° ± 5°C, 72^{+8}_{-4} HOURS.	↕	↕
CONSTANT ACCELERATION	METHOD 2006 (20,000 G) Y_1 DIRECTION ONLY.	↕	↕
POWER, BURN-IN	METHOD 1026 SEE NOTE 3 D (5) AND FIGURE 2 T_A = +22°C MIN; IN FREE AMBIENT AIR $t = 168^{+12}_{-6}$ HOURS	↕	↕
SEAL TEST	SEE NOTE 3 D (3)	100%	NO REQUIREMENT

MASTER

(H) REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
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DWG. NO. CONTRACT
DRAWN R. Kane DATE 12 Mar 63
CHECKED R. D. Hanley
APPROVAL R. D. Hanley
APPROVAL 3/13/63
NASA APPROVAL W. S. Swingle 13 March 1963
MIT APPROVAL W Kupfer 13 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MICRO-NOR GATE (TO 47 SIZE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE NONE
WT
SHEET 2 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	THIS SHEET ADDED REV H PER TDRR 00562	3-13-63	WK

TABLE II

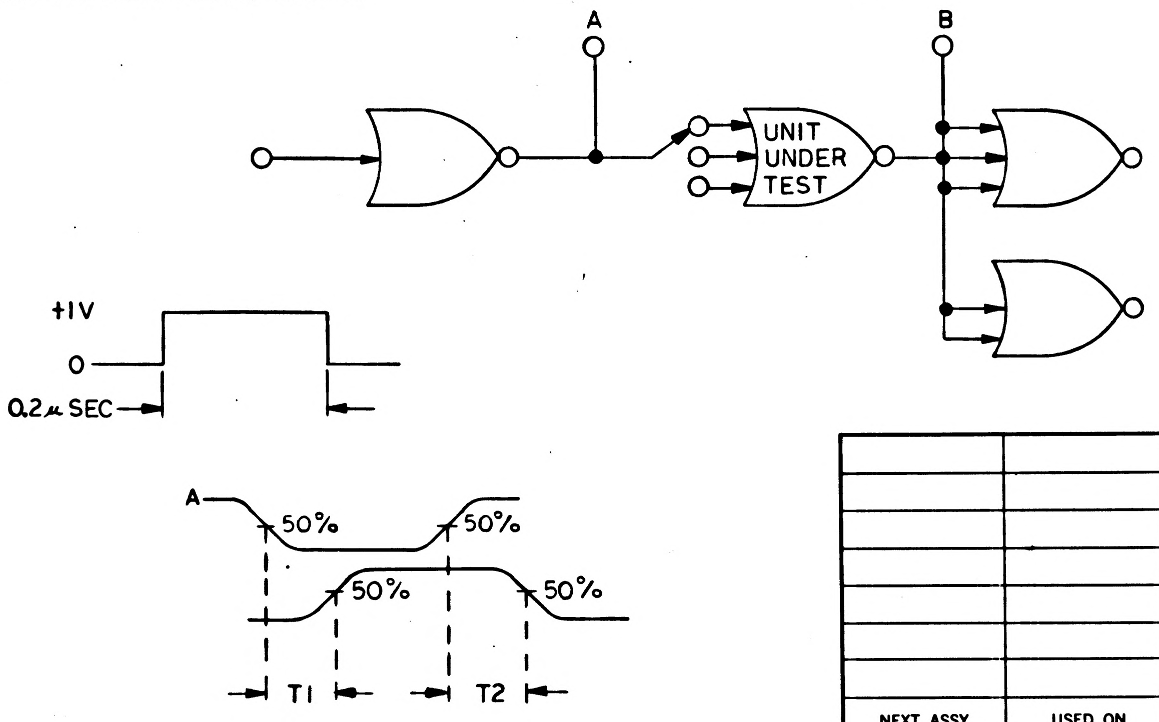
ACCEPTANCE INSPECTION

TEST	SYMBOL	TEST CONDITIONS						LIMITS MIN	LIMITS MAX	UNITS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	METHOD 2071 SEE NOTE 3 D (5)						-	-		*LTPD = 10 MAX ACC NO.=3	*LTPD = 10 MAX ACC NO.=3
SUBGROUP 2		PIN 1	PIN 3	PIN 4	PIN 5	PIN 7	PIN 8					
BASE CURRENT, I_1	I_{B1}	+785±2mV	+1500±10mV	0V	+1500±10mV	-	+3±.03V	-	370	uA	100%	*LTPD = 2 MAX ACC NO.=3 (COMBINED)
BASE CURRENT, I_3	I_{B3}	+1500±10mV	+785±2mV	0V	+1500±10mV	-	+3±.03V	-	370	uA		
BASE CURRENT, I_5	I_{B5}	+1500±10mV	+1500±10mV	0V	+785±2mV	-	+3±.03V	-	370	uA		
OUTPUT VOLTAGE, PIN 7	V_O	+785±2mV	OPEN	0V	OPEN	-	+3±.03V	-	350	mV	↕	↕
OUTPUT VOLTAGE, PIN 7	V_O	OPEN	+785±2mV	0V	OPEN	-	+3±.03V	-	350	mV		
OUTPUT VOLTAGE, PIN 7	V_O	OPEN	OPEN	0V	+785±2mv	-	+3±.03V	-	350	mV		
SATURATION VOLTAGE PIN 7	V_S	+1.50±.01V	OPEN	0V	OPEN	-	+3±.03V	-	300	mV		
SATURATION VOLTAGE PIN 7	V_S	OPEN	+1.50±.01V	0V	OPEN	-	+3±.03V	-	300	mV		
SATURATION VOLTAGE PIN 7	V_S	OPEN	OPEN	0V	+1.50±.01V	-	+3±.03V	-	300	mV		
OUTPUT CURRENT, PIN 7	I_O	+540±10mV	+540±10mV	0V	+540±10mV	+785±2mV	+3±.03V	2.90	-	mA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	+540±10mV	+540±10mV	0V	+540±10mV	+1.00±.01V	OPEN	-	200	uA		
COLLECTOR CUTOFF CURRENT	I_{CEO}	OPEN	OPEN	0V	OPEN	+5±.1V	OPEN	-	100	uA	100%	*LTPD = 2 MAX ACC NO.=3 (COMBINED)
EMITTER CUTOFF CURRENT	I_{EBO}	0V	0V	5±.1V	0V	OPEN	OPEN	-	1	mA		
COLLECTOR CUTOFF CURRENT	I_{CBO}	0V	0V	OPEN	0V	+8±.1V	OPEN	-	1	mA		
AVERAGE PROPAGATION DELAY	T_p	SEE NOTE 3 D (4) AND FIGURE 1						-	35	nsec	*LTPD = 10 MAX ACC NO.=3	
COLLECTOR RESISTANCE	R_L	BETWEEN PINS 7 AND 8 MEASUREMENT CURRENT = 5mA						530	-	OHMS	*LTPD = 10 MAX ACC NO.=3	

* LTPD PER MIL-S-19500C, TABLE IV

FIGURE I

AVERAGE PROPAGATION DELAY



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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
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DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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DRAWN R. Kane DATE 12 Mar 63
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APPROVAL L. J. Hanley
APPROVAL 3/13/63
NASA APPROVAL 13 March 1963
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HOUSTON, TEXAS

MICRO-NOR GATE (TO 47 SIZE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006771
SCALE NONE
WT
SHEET 3 OF 4

INCHES
0 1 2
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H 1006771

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	THIS SHEET ADDED REV H PER TDRR 00562	3-13-63	W.I.

TABLE III

QUALITY DEMONSTRATION TESTS

TEST	TEST CONDITION	LOT	
		1 TO 500	OVER 500
SUBGROUP 1 PHYSICAL DIMENSION	SEE NOTE 3 C (3) METHOD 2066	NO REQUIREMENTS	LTPD* = 20 MAX ACC NO. = 1
SUBGROUP 2 ** THERMAL SHOCK	SEE NOTE 3 C (4) METHOD 1056, CONDITION B (150° TO -65°C, 5 CYCLES)		LTPD* = 10 (COMBINED) MAX ACC NO.= 3
SEAL TEST	SEE NOTE 3 D (3)		
SUBGROUP 3 ** STORAGE LIFE	SEE NOTE 3 C (4) METHOD 1031 Tstg = 150° ± 5°C, 1000 HOURS		LTPD* = 10 (COMBINED) MAX ACC NO. = 3
SHOCK	METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS 20 BLOWS TORAL		
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM.		
CONSTANT ACCELERATION	METHOD 2006, (20,000 G) Y1 AXIS ONLY		
SUBGROUP 4 OPERATION LIFE	SEE NOTE 3 C (4) METHOD 1026 SEE NOTE 3 D (5) AND FIGURE 2 T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		λ* = 10 MAX ACC NO. = 3
SUBGROUP 5 ** LEAD TENSION LEAD FATIGUE	SEE NOTE 3 C (3) SEE NOTE 3 D (2) SEE NOTE 3 D (1)		LTPD*= 20 (COMBINED) MAX ACC NO. = 1
SUBGROUP 6 ** VISUAL INTERNAL INSPECTION	SEE NOTE 2 C (5) AND NOTE 3 D (7)	NO REQUIREMENTS	LTPD* = 7 MAX ACC NO. = 1

* LTPD AND λ PER MIL-S-19500C, TABLE IV

** TEST TO BE PERFORMED IN SEQUENCE INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITIONS	LIMIT		UNITS
			MIN	MAX	
END POINTS FOR SUBGROUPS 2,3 AND 4					
OUTPUT VOLTAGE, PIN 7	V_O	SAME AS SPECIFIED IN TABLE II	-	350	mV
OUTPUT VOLTAGE, PIN 7	V_O		-	350	mV
OUTPUT VOLTAGE, PIN 7	V_O		-	350	mV
OUTPUT CURRENT, PIN 7	I_O		2.90	-	mA
COLLECTOR EMITTER THRESHOLD CURRENT	I_{CEX}		-	200	uA
BASE CURRENT, I_1	I_{B1}		-	370	uA
BASE CURRENT, I_3	I_{B3}		-	370	uA
BASE CURRENT, I_5	I_{B5}		-	370	uA

REV H THIS SHEET ADDED

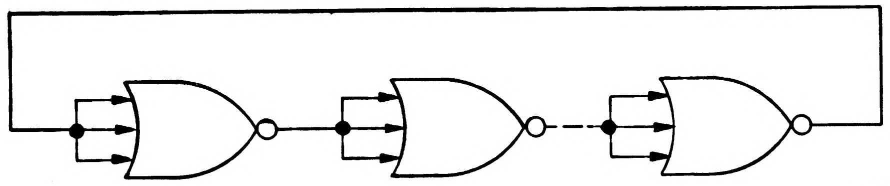

FIGURE 2

TEST CIRCUIT — POWER BURN-IN

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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MANNED SPACECRAFT CENTER
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MICRO-NOR GATE (TO 47 SIZE)

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CODE IDENT NO.
SIZE C
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SCALE NONE
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SHEET 4 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006772 (A)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 6 PER TDRR: 00433	2-20-63	wJB WH

NOTES:

1. GENERAL REQUIREMENTS: SHALL MEET MIL-R-5757 WITH THE FOLLOWING QUALIFICATIONS.
   - A. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC LATCHING ACTION.
   - B. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS PER ND 1015402 AND SILVER CONTACTS.
   - C. SEAL: HERMETICALLY SEALED.
   - D. LEAD PULL: 3.0 ± 0.3 POUNDS.
   - E. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINALS ONE AND NINE.
2. ELECTRICAL REQUIREMENTS:
   - A. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.
   - B. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.
   - C. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.
   - D. COIL POWER, PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.
   - E. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.
   - F. CONTACT CURRENT RATING: 2 AMPERES AT 28 VDC OR 120 VAC RESISTIVE LOAD.
   - G. CONTACT RESISTANCE: 0.05 OHMS MAX AT 1 AMP AND 6 VOLTS.
   - H. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.
   - J. TIME, TRANSFER: 1 MILLISECOND MAX.
   - K. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.
   - L. TIME, CONTACT CHATTER: NONE WHEN TESTED PER PARAGRAPH 4.D. OR 4.E.
   - M. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC FOR 5 SECONDS BETWEEN OPEN CONTACTS.
   - N. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
   - R. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN-
     - (a) MUTUALLY INSULATED TERMINALS
     - (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
     - (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
     - (d) CONTACTS AND FRAME
3. RELIABILITY REQUIREMENT:
   - A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE TEMPERATURE RANGE AND AT THE RATED RESISTIVE LOAD.
   - B. RUN-IN: EVERY RELAY SHALL BE SUCCESSFULLY RUN FOR 5000 ON-OFF CYCLES WITHOUT OPENS, SHORTS, OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS.
   - C. DOCUMENTATION, TIME (OR CYCLES) TO FAILURE: A CERTIFIED TABULATION OF THE RUN-IN TEST LOTS SHALL BE FURNISHED WITH EACH SHIPMENT ENUMERATING THE TOTAL NUMBER OF RELAYS TESTED, THE NUMBER THAT FAILED, AND THE TIME (OR CYCLES) TO FAILURE.
4. ENVIRONMENTAL REQUIREMENTS:
   - A. HUMIDITY (MOISTURE RESISTANCE): UP TO 100% RH.
   - B. OPERATING TEMP RANGE: -65°C TO +125°C.
   - C. THERMAL SHOCK: -65°C TO +125°C.
   - D. VIBRATION: .195 INCH DA OR ± 30 G (WHICHEVER IS LESS) FROM 10 TO 5000 CPS.
   - E. SHOCK: 100 G FOR 6 MILLISECONDS.
5. QUALITY ASSURANCE PROVISIONS: THE PROVISIONS OF MIL-R-5757 AND SECTION I OF ND 1015404 SHALL APPLY IN ADDITION TO THOSE LISTED.
   - A. EARLY FAILURE: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE CONTACT LOAD OF FROM 0.5 TO 0.8 AMPERES AT 30 VDC. THERE SHALL BE NO MISSES, OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.
6.
   - A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

REV- A	REV-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J. A. Faffini DATE 6NOV62
CHECKED D. M. Sleeper 27NOV62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006772
SCALE —	WT SEE SHEET 2	SHEET 1 OF 2

1006772

1006772 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 6 PER TDRR: 00433	2-20-63	wfo WH
.B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WR

NOTES:

1. GENERAL REQUIREMENTS: SHALL MEET MIL-R-5757 WITH THE FOLLOWING QUALIFICATIONS.
   - A. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC LATCHING ACTION.
   - B. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS PER ND 1015402 AND SILVER CONTACTS.
   - C. SEAL: HERMETICALLY SEALED.
   - D. LEAD PULL: 3.0 ± 0.3 POUNDS.
   - E. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINALS ONE AND NINE.
2. ELECTRICAL REQUIREMENTS:
   - A. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.
   - B. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.
   - C. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.
   - D. COIL POWER, PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.
   - E. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.
   - F. CONTACT CURRENT RATING: 2 AMPERES AT 28 VDC OR 120 VAC RESISTIVE LOAD.
   - G. CONTACT RESISTANCE: 0.05 OHMS MAX AT 1 AMP AND 6 VOLTS.
   - H. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.
   - J. TIME, TRANSFER: 1 MILLISECOND MAX.
   - K. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.
   - L. TIME, CONTACT CHATTER: NONE WHEN TESTED PER PARAGRAPH 4.D. OR 4.E.
   - M. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC FOR 5 SECONDS BETWEEN OPEN CONTACTS.
   - N. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
   - R. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN-
     - (a) MUTUALLY INSULATED TERMINALS
     - (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
     - (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
     - (d) CONTACTS AND FRAME
3. RELIABILITY REQUIREMENT:
   - A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE TEMPERATURE RANGE AND AT THE RATED RESISTIVE LOAD.
   - B. RUN-IN: EVERY RELAY SHALL BE SUCCESSFULLY RUN FOR 5000 ON-OFF CYCLES WITHOUT OPENS, SHORTS, OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS.
   - C. DOCUMENTATION, TIME (OR CYCLES) TO FAILURE: A CERTIFIED TABULATION OF THE RUN-IN TEST LOTS SHALL BE FURNISHED WITH EACH SHIPMENT ENUMERATING THE TOTAL NUMBER OF RELAYS TESTED, THE NUMBER THAT FAILED, AND THE TIME (OR CYCLES) TO FAILURE.
4. ENVIRONMENTAL REQUIREMENTS:
   - A. HUMIDITY (MOISTURE RESISTANCE): UP TO 100% RH.
   - B. OPERATING TEMP RANGE: -65°C TO +125°C.
   - C. THERMAL SHOCK: -65°C TO +125°C.
   - D. VIBRATION: .195 INCH DA OR ± 30 G (WHICHEVER IS LESS) FROM 10 TO 5000 CPS.
   - E. SHOCK: 100 G FOR 6 MILLISECONDS.
5. QUALITY ASSURANCE PROVISIONS: THE PROVISIONS OF MIL-R-5757 AND SECTION I OF ND 1015404 SHALL APPLY IN ADDITION TO THOSE LISTED.
   - A. EARLY FAILURE: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE CONTACT LOAD OF FROM 0.5 TO 0.8 AMPERES AT 30 VDC. THERE SHALL BE NO MISSES, OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.
6. A. WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B. UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

Ⓑ REPLACED WITH CHANGE BY REV C

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

REV B	REV —
REV- A	REV-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J. A. Taffini DATE 6NOV62
CHECKED D. M. Slupin 27NOV62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL W J Kupfer 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006772
SCALE —	WT SEE SHEET 2	SHEET 1 OF 2

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1006772 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK

NOTES:

1. GENERAL REQUIREMENTS: SHALL MEET MIL-R-5757 WITH THE FOLLOWING QUALIFICATIONS.
   - A. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC LATCHING ACTION.
   - B. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS PER ND 1015402 AND SILVER CONTACTS.
   - C. SEAL: HERMETICALLY SEALED.
   - D. LEAD PULL: 3.0 ± 0.3 POUNDS.
   - E. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINALS ONE AND NINE.
2. ELECTRICAL REQUIREMENTS:
   - A. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.
   - B. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.
   - C. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.
   - D. COIL POWER, PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.
   - E. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.
   - F. CONTACT CURRENT RATING: 2 AMPERES AT 28 VDC OR 120 VAC RESISTIVE LOAD.
   - G. CONTACT RESISTANCE: 0.05 OHMS MAX AT 1 AMP AND 6 VOLTS.
   - H. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.
   - J. TIME, TRANSFER: 1 MILLISECOND MAX.
   - K. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.
   - L. TIME, CONTACT CHATTER: NONE WHEN TESTED PER PARAGRAPH 4.D. OR 4.E.
   - M. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC FOR 5 SECONDS BETWEEN OPEN CONTACTS.
   - N. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
   - P. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN-
     - (a) MUTUALLY INSULATED TERMINALS
     - (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
     - (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
     - (d) CONTACTS AND FRAME
3. RELIABILITY REQUIREMENT:
   - A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE TEMPERATURE RANGE AND AT THE RATED RESISTIVE LOAD.
   - B. RUN-IN: EVERY RELAY SHALL BE SUCCESSFULLY RUN FOR 5000 ON-OFF CYCLES WITHOUT OPENS, SHORTS, OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS.
   - C. DOCUMENTATION, TIME (OR CYCLES) TO FAILURE: A CERTIFIED TABULATION OF THE RUN-IN TEST LOTS SHALL BE FURNISHED WITH EACH SHIPMENT ENUMERATING THE TOTAL NUMBER OF RELAYS TESTED, THE NUMBER THAT FAILED, AND THE TIME (OR CYCLES) TO FAILURE.
4. ENVIRONMENTAL REQUIREMENTS:
   - A. HUMIDITY (MOISTURE RESISTANCE): UP TO 100% RH.
   - B. OPERATING TEMP RANGE: -65°C TO +125°C.
   - C. THERMAL SHOCK: -65°C TO +125°C.
   - D. VIBRATION: .195 INCH DA OR ± 30 G (WHICHEVER IS LESS) FROM 10 TO 5000 CPS.
   - E. SHOCK: 100 G FOR 6 MILLISECONDS.
5. QUALITY ASSURANCE PROVISIONS: THE PROVISIONS OF MIL-R-5757 AND SECTION I OF ND 1015404 SHALL APPLY IN ADDITION TO THOSE LISTED.
   - A. EARLY FAILURE: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE CONTACT LOAD OF FROM 0.5 TO 0.8 AMPERES AT 30 VDC. THERE SHALL BE NO MISSES, OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

Ⓒ REPLACES REV B WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

MASTER

C	—
REV- A	REV-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± #	± #	± #

DO NOT SCALE THIS DRAWING

MATERIAL —#—

HEAT TREATMENT —#—

FINAL FINISH —#—

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J. A. Zaffini DATE 6 NOV 62
CHECKED D. M. Sleeper 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL W J Wagner for 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006772

SCALE —#— WT SEE SHEET 2 SHEET 1 OF 2

1006772 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D	1006772

(M)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REPLACED BY REV E WITH CHANGES PER TDRR 00950	24Jan63	WK.

NOTES:

1. GENERAL REQUIREMENTS: SHALL MEET MIL-R-5757 WITH THE FOLLOWING QUALIFICATIONS.
   - A. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC LATCHING ACTION.
   - B. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS PER ND 1015402 AND SILVER CONTACTS.
   - C. SEAL: HERMETICALLY SEALED.
   - D. LEAD PULL: 3.0 ± 0.3 POUNDS.
   - E. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINALS ONE AND NINE.
2. ELECTRICAL REQUIREMENTS:
   - A. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.
   - B. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.
   - C. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.
   - D. COIL POWER, PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.
   - E. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.
   - F. CONTACT CURRENT RATING: 2 AMPERES AT 28 VDC OR 120 VAC RESISTIVE LOAD.
   - G. CONTACT RESISTANCE: 0.05 OHMS MAX AT 1 AMP AND 6 VOLTS.
   - H. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.
   - J. TIME, TRANSFER: 1 MILLISECOND MAX.
   - K. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.
   - L. TIME, CONTACT CHATTER: NONE WHEN TESTED PER PARAGRAPH 4.D. OR 4.E.
   - M. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC FOR 5 SECONDS BETWEEN OPEN CONTACTS.
   - N. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
   - P. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN-
     - (a) MUTUALLY INSULATED TERMINALS
     - (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
     - (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
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3. RELIABILITY REQUIREMENT:
   - A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE TEMPERATURE RANGE AND AT THE RATED RESISTIVE LOAD.
   - B. RUN-IN: EVERY RELAY SHALL BE SUCCESSFULLY RUN FOR 5000 ON-OFF CYCLES WITHOUT OPENS, SHORTS, OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS.
   - C. DOCUMENTATION, TIME (OR CYCLES) TO FAILURE: A CERTIFIED TABULATION OF THE RUN-IN TEST LOTS SHALL BE FURNISHED WITH EACH SHIPMENT ENUMERATING THE TOTAL NUMBER OF RELAYS TESTED, THE NUMBER THAT FAILED, AND THE TIME (OR CYCLES) TO FAILURE.
4. ENVIRONMENTAL REQUIREMENTS:
   - A. HUMIDITY (MOISTURE RESISTANCE): UP TO 100% RH.
   - B. OPERATING TEMP RANGE: -65°C TO +125°C.
   - C. THERMAL SHOCK: -65°C TO +125°C.
   - D. VIBRATION: .195 INCH DA OR ± 30 G (WHICHEVER IS LESS) FROM 10 TO 5000 CPS.
   - E. SHOCK: 100 G FOR 6 MILLISECONDS.
5. QUALITY ASSURANCE PROVISIONS: THE PROVISIONS OF MIL-R-5757 AND CLASS 1 OF ND 1015404 SHALL APPLY IN ADDITION TO THOSE LISTED.
   - A. EARLY FAILURE: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE CONTACT LOAD OF FROM 0.5 TO 0.8 AMPERES AT 30 VDC. THERE SHALL BE NO MISSES, OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.

D REPLACED BY REV E WITH CHANGES

Ⓒ REPLACES REV B WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

D	D
C	—
REV- A	REV-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN J. A. Zaffini DATE 6NOV62
CHECKED D. M. Sleeper 27NOV62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/17/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE —
WT SEE SHEET 2
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006772 E

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REVISED & REDRAWN WITH CHANGES 00950 UPGRADED TO CLASS A RELEASE PER TDRR	24 Apr 63	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404 CLASS 2.

   C. UNITS SHALL MEET ALL APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH QUALIFICATIONS AS NOTED BELOW.

2. INSPECTION & ACCEPTANCE:

   A. MECHANICAL REQUIREMENTS

      1. LEADS: UNITS SHALL HAVE WELDABLE KOVAR LEADS PER ND PS1015402 EXCEPT LEAD DIAMETER WHICH SHALL BE PER FIGURE. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

      2. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC LATCHING ACTION.

      3. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS AND GOLD PLATED SILVER CONTACTS.

      4. SEAL: HERMETICALLY SEALED. (SEAL TEST III)

      5. LEAD PULL: 3.0 POUNDS MIN.

      6. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINALS ONE AND NINE.

   B. ELECTRICAL REQUIREMENTS

      1. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.

      2. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.

      3. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.

      4. COIL PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.

      5. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.

      6. CONTACT CURRENT RATING: 2 AMPERES MAX. AT 28 VDC OR 120 VAC OPEN CIRCUIT WITH RESISTIVE LOAD.

      7. CONTACT RESISTANCE: 1 OHM MAX AT 1 ma.

      8. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.

      9. TIME, TRANSFER: 1 MILLISECOND MAX.

      10. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.

      11. TIME, CONTACT CHATTER: 10 us MAX. WHEN TESTED PER PARAGRAPH 3.B.4 OR 3.B.5.

ELECTRICAL REQUIREMENTS (CONT'D)

12. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC MIN FOR 5 SECONDS MIN BETWEEN OPEN CONTACTS.

13. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

14. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN —
    (a) MUTUALLY INSULATED TERMINALS
    (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
    (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
    (d) CONTACTS AND FRAME

3. DESIGN REQUIREMENTS:

   A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE OPERATING TEMPERATURE RANGE AND FOR ALL CURRENTS UP TO RATED CONTACT CURRENT.

4. SPECIAL CONDITIONING: (BY MANUFACTURER)

   A. BURN IN: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE LOAD CURRENT OF 20 ua MAX AT 20 MV DC. THERE SHALL BE NO OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 1000 OHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.

   FOLLOWING BURN IN, RELAYS SHALL BE TESTED AND SHALL MEET THE REQUIREMENTS OF NOTE 2,B,6,7,8,9 & 10.

Ⓔ REPLACES REV D WITH CHANGES

E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 4/23/63
CHECKED A. Marts 4-24-63
APPROVAL 4/24/63
APPROVAL
NASA APPROVAL 4/24/63
MIT APPROVAL W Kopfer 24 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006772
SCALE	WT	SHEET 1 OF 2

1006772 E

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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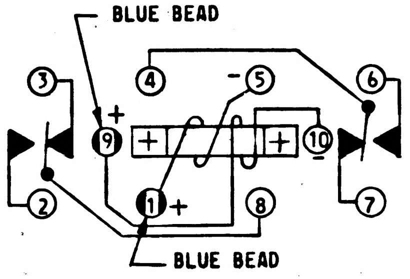
1006772 E

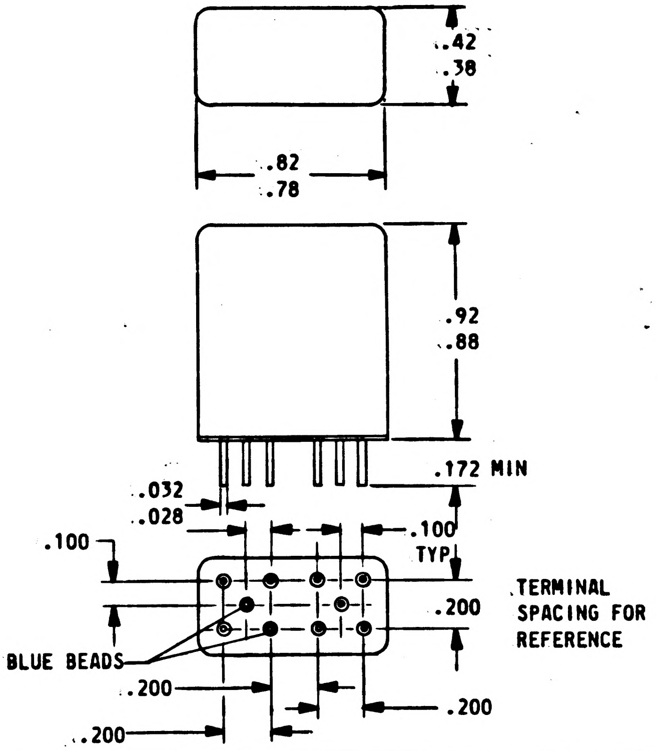
REVISIONS CLASS B TDRR 00165 3-12-62

SYM	DESCRIPTION	DATE	APPROVAL
E	REVISED & UPGRADED TO CLASS A RELEASE PER TDRR 00950	24Apr63	WK

DASH NO.	COIL RES OHMS ±10%	PULL-IN MADC (MAX)	DROP-OUT MADC	MAX CONT CURRENT MADC AT 125°C	SUGGESTED SOURCE VOLTAGE DC
-1	325	17.5	MUST HAVE OPPOSITE POLARITY OF SAME MAGNITUDE (±10%)	32.0	12
-2	200	30	MUST HAVE OPPOSITE POLARITY OF SAME MAGNITUDE (±10%)	60	10



ELECTRICAL SCHEMATIC
+ VOLTAGE ON TERM. NO. 1 OR NO. 9 CLOSES CONTACTS AS SHOWN



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J.a. Zaffini DATE 6 NOV 62
CHECKED D.M. Sleefe 27 NOV 62
APPROVAL E.C. Hall 11 Dec 62
APPROVAL 4/24/63
NASA APPROVAL W. J. Rhine 12-12-62
MIT APPROVAL 12/12/6

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE 2/1
WT ACT. .044 LB MAX
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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M

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REVISED & REDRAWN WITH CHANGES 00950 UPGRADED TO CLASS A RELEASE PER TDRR	24Apr63	WK
F	REPLACED BY REV G WITH CHANGES PER TDRR 02965	5Sep63	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404 CLASS 2.
   - C. UNITS SHALL MEET ALL APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH QUALIFICATIONS AS NOTED BELOW.
2. INSPECTION & ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS
     - 1. LEADS: UNITS SHALL HAVE WELDABLE KOVAR LEADS PER ND PS1015402 EXCEPT LEAD DIAMETER WHICH SHALL BE PER FIGURE. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
     - 2. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC LATCHING ACTION.
     - 3. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS AND GOLD PLATED SILVER CONTACTS.
     - 4. SEAL: HERMETICALLY SEALED. (SEAL TEST III)
     - 5. LEAD PULL: 3.0 POUNDS MIN.
     - 6. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINALS ONE AND NINE.
   - B. ELECTRICAL REQUIREMENTS
     - 1. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.
     - 2. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.
     - 3. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.
     - 4. COIL PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.
     - 5. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.
     - 6. CONTACT CURRENT RATING: 2 AMPERES MAX. AT 28 VDC OR 120 VAC OPEN CIRCUIT WITH RESISTIVE LOAD.
     - 7. CONTACT RESISTANCE: 1 OHM MAX AT 1 ma.
     - 8. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.
     - 9. TIME, TRANSFER: 1 MILLISECOND MAX.
     - 10. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.
     - 11. TIME, CONTACT CHATTER: 10 us MAX. WHEN TESTED PER PARAGRAPH 3.B,4 OR 3.B,5.

ELECTRICAL REQUIREMENTS (CONT'D)

12. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC MIN FOR 5 SECONDS MIN BETWEEN OPEN CONTACTS.
13. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
14. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN —
    - (a) MUTUALLY INSULATED TERMINALS
    - (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
    - (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
    - (d) CONTACTS AND FRAME

3. DESIGN REQUIREMENTS:
   - A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE OPERATING TEMPERATURE RANGE AND FOR ALL CURRENTS UP TO RATED CONTACT CURRENT.
4. SPECIAL CONDITIONING: (BY MANUFACTURER)
   - A. BURN IN: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE LOAD CURRENT OF 20 ua MAX AT 20 MV DC. THERE SHALL BE NO OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 1000 OHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.

     FOLLOWING BURN IN, RELAYS SHALL BE TESTED AND SHALL MEET THE REQUIREMENTS OF NOTE 2,B,6,7,8,9 & 10.

Ⓕ REPLACED BY REV G WITH CHANGES

Ⓔ REPLACES REV D WITH CHANGES

F	F
E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Guy ... DATE 4/23/63
CHECKED A. Maatz 4-24-63
APPROVAL ... 4/24/63
APPROVAL
NASA APPROVAL K. Mitchell 4/24/63
MIT APPROVAL W Kapfer 24Apr63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006772
SCALE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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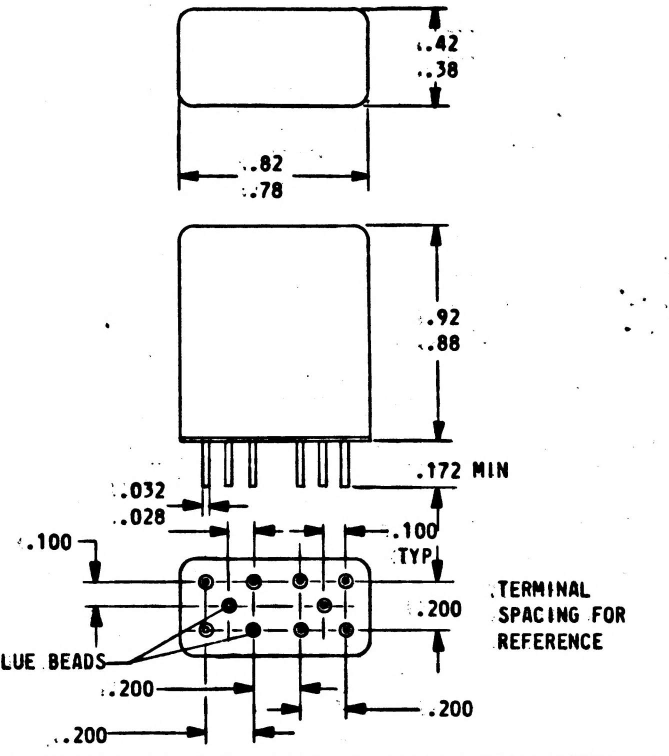
1006772 F

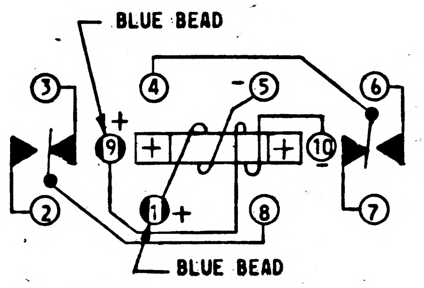
REVISIONS CLASS B TDRR 00165 3-12-62

SYM	DESCRIPTION	DATE	APPROVAL
E	REVISED & UPGRADED TO CLASS A RELEASE PER TDRR 00950	24Apr63	WK
F	REPLACED BY REV G WITH CHANGES PER TDRR 02965	5Sep63	WK

DASH NO.	COIL RES OHMS ±10%	PULL-IN MADC (MAX)	DROP-OUT MADC	MAX CONT CURRENT MADC AT 125°C	SUGGESTED SOURCE VOLTAGE DC
-1	325	17.5	MUST HAVE OPPOSITE POLARITY OF SAME MAGNITUDE (±10%)	32.0	12
-2	200	30	MUST HAVE OPPOSITE POLARITY OF SAME MAGNITUDE (±10%)	60	10

Ⓕ REPLACED BY REV G WITH CHANGES





ELECTRICAL SCHEMATIC
+ VOLTAGE ON TERM.
NO. 1 OR NO. 9 CLOSES
CONTACTS AS SHOWN

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN J. A. Faffins DATE 6 NOV 62
CHECKED D. M. Sleeper 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL 4/24/63
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE 2/1
WT ACT. .044 LB MAX
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

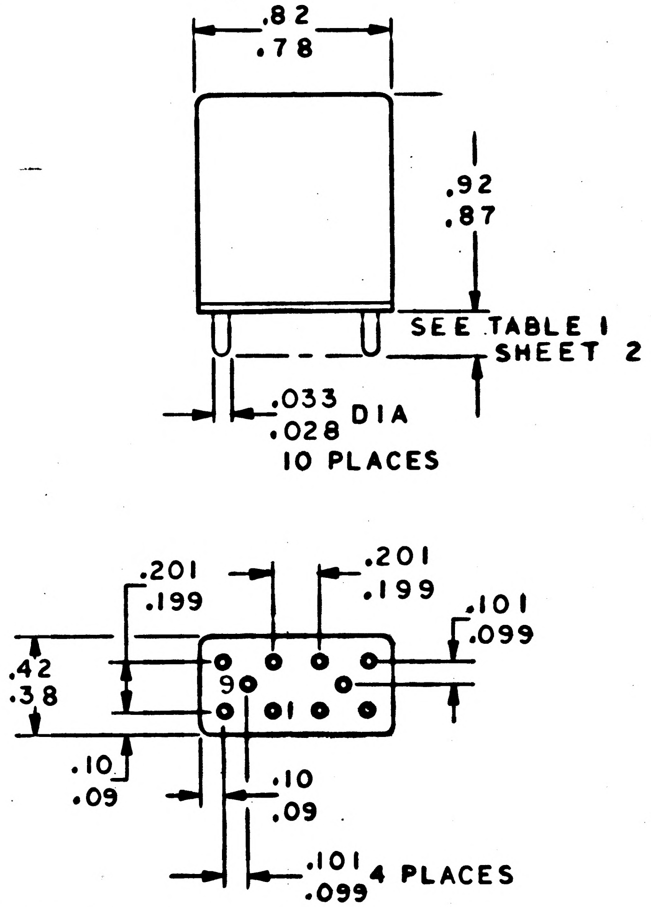
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sep 63	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

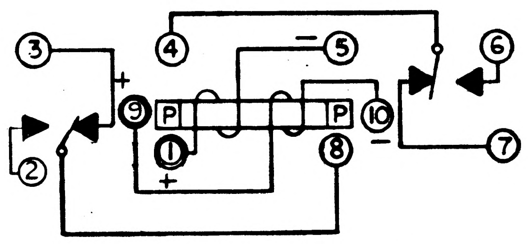
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
2. ACCEPTANCE AND INSPECTION:
   - A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.
   - B. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (2) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:
         - NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
         - DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
         - DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.
         - MUST OPERATE CURRENT, MAXIMUM.
         - SCHEMATIC DIAGRAM.
         - BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.
       - (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.
     - (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN.
     - (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) COIL CURRENT: MUST-OPERATE (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.
     - (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.
     - (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.
     - (4) DIELECTRIC STRENGTH:
       - (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.
     - (6) OPERATE AND RELEASE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.
     - (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.
     - (8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.
     - (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



SCHEMATIC
(FOR REFERENCE ONLY)



+ VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN

Ⓖ REPLACES REV F WITH CHANGES

G	G
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crasp DATE 29 Aug 63
CHECKED J Ruggiero
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sept 63	WJR

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 0.75 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1,3, 6,7,8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RES ● 25°C OHMS MIN-MAX	MUST OPERATE CURRENT MADC MAX (EITHER DIRECTION)	MAX CONT CURRENT MADC AT 185°C	SUGGESTED SOURCE VOLTAGE DC	LEAD LENGTH MAX/MIN	CORE PULL IN POWER SENSITIVITY NOMINAL MW
1	270-374	22.6	32.0	12	.260/.240	150
2	178-242	30	60	10	.260/.240	150
3	1020-1380	9.0	25	26.5	- /1.00	100

Ⓖ REPLACES REV F WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 28 Aug 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL Eldon C Hall, 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL 5 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006772
SCALE NONE WT SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H	1006772

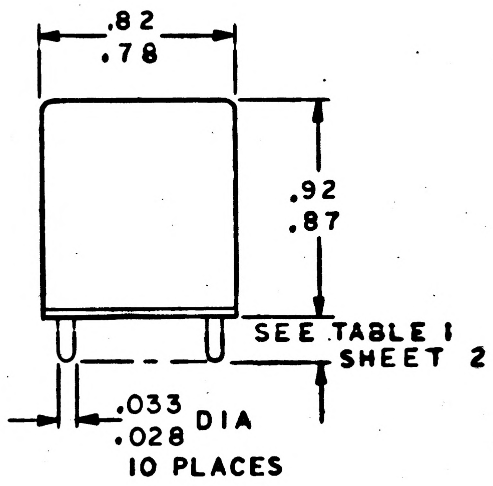
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sep 63	WK
H	REVISED PER TDRR 04002	17 Oct 63	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

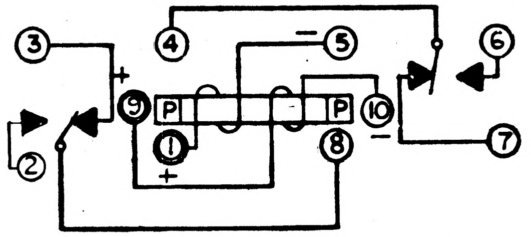
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
2. ACCEPTANCE AND INSPECTION:
   - A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.
   - B. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (2) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:
         - NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
         - DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
         - DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.
         - MUST OPERATE CURRENT, MAXIMUM.
         - SCHEMATIC DIAGRAM.
         - BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.
       - (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.
     - (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. TERMINAL SPACING SHALL BE REFERENCED TO ℄ OF HEADER.
     - (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) COIL CURRENT: MUST-OPERATE (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.
     - (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.
     - (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.
     - (4) DIELECTRIC STRENGTH:
       - (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.
     - (6) OPERATE AND RELEASE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.
     - (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.
     - (8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.
     - (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

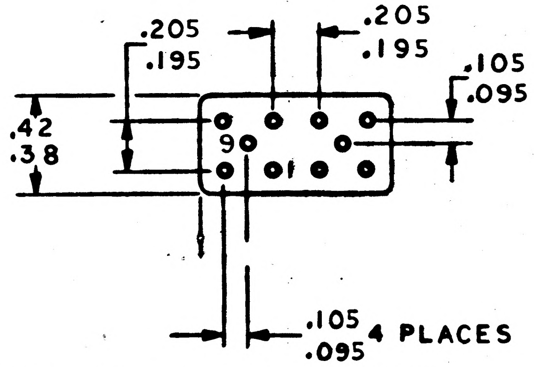
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



SCHEMATIC
(FOR REFERENCE ONLY)



+ VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN



Ⓖ REPLACES REV F WITH CHANGES

MASTER

H	H
G	G
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN G. Crasfi DATE 29 Aug 63
CHECKED J. Ruggiero
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006772
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H 1006772

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sept 63	WJK
H	REVISED PER TDRR 04002	17 Oct 63	WK

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NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 0.75 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1,3, 6,7,8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RES @ 25°C OHMS MIN-MAX	MUST OPERATE CURRENT MADC MAX (EITHER DIRECTION)	MAX CONT CURRENT MADC AT 125°C	SUGGESTED SOURCE VOLTAGE DC	LEAD LENGTH MAX/MIN	CORE PULL IN POWER SENSITIVITY NOMINAL MW
1	270-374	22.6	32.0	12	.260/.240	150
2	178-242	30	60	10	.260/.240	150
3	1020-1380	9.0	25	26.5	- /1.00	100

Ⓖ REPLACES REV F WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Corapi DATE 28 Aug 63
CHECKED J. Rogers
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Jaffe 5 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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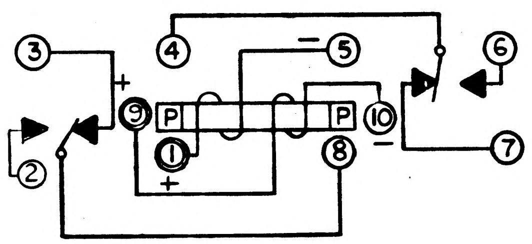
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sep 63	WK
H	REVISED PER TDRR 04002	17Oct63	WK
J	REVISED PER TDRR 15736	2/2/65	WK

NOTES:

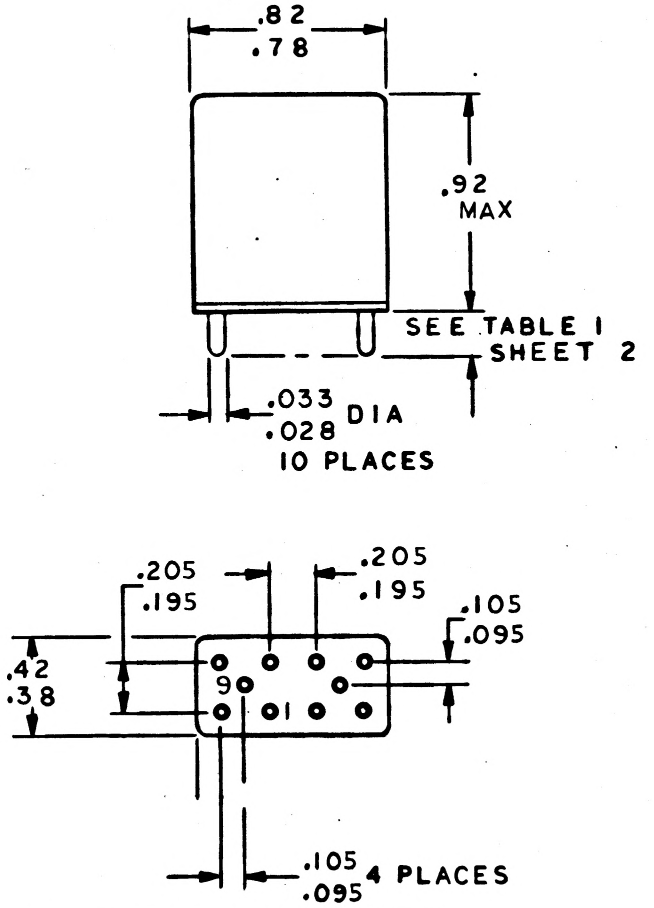
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
2. ACCEPTANCE AND INSPECTION:
   - A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.
   - B. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402.
     - (2) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:
         - NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
         - DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
         - DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.
         - MUST OPERATE CURRENT, MAXIMUM.
         - SCHEMATIC DIAGRAM.
         - BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.
       - (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.
     - (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. TERMINAL SPACING SHALL BE REFERENCED TO ℄ OF HEADER.
     - (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) COIL CURRENT: MUST-OPERATE (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.
     - (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.
     - (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.
     - (4) DIELECTRIC STRENGTH:
       - (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.
     - (6) OPERATE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.
     - (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.
     - (8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.
     - (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SCHEMATIC
(FOR REFERENCE ONLY)



+ VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN



Ⓖ REPLACES REV F WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 29 Aug 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006772 J

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sept 63	WJK
H	REVISED PER TDRR 04002	17 Oct 63	WK
J	REVISED PER TDRR 15736	2/2/65	WK

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:
   A. ELECTRICAL RATINGS:
      (1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.
      (2) COIL POWER: 0.75 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT PER COIL AT PLUS 125 DEGREES CENTIGRADE.
      (3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.
      (4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.
      (5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.
      (6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.
      (7) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.
      (8) DIELECTRIC STRENGTH:
         (a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
   B. CONSTRUCTION:
      (1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.
      (2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.
   C. QUALIFICATION REQUIREMENTS:
      (1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.
   D. ENVIRONMENTAL REQUIREMENTS:
      (1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.
      (2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.
      (3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.
      (4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.
4. SPECIAL CONDITIONING:
   A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:
      (1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.
      (2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.
      (3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.
      (4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.
      (5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

TABLE I

DASH NO.	COIL RES • 25°C OHMS MIN-MAX	MUST OPERATE CURRENT MADC MAX (EITHER DIRECTION)	MAX CONT CURRENT MADC AT 125°C	SUGGESTED SOURCE VOLTAGE DC	LEAD LENGTH MAX/MIN	CORE PULL IN POWER SENSITIVITY NOMINAL MW
1	270-374	22.6	32.0	12	.260/.240	150
2	178-242	30	60	10	.260/.240	150
3	1020-1380	9.0	25	26.5	- /1.00	100

5. VENDOR SUPPLIED DATA:
   A. CERTIFICATE OF COMPLIANCE TO PS 1015402.
   B. BEFORE-AND-AFTER-MISS-TEST READINGS FOR:
      (1) MUST - OPERATE CURRENT (BOTH DIRECTIONS)
      (2) CONTACT RESISTANCE
      (3) OPERATE TIME (BOTH DIRECTIONS)
      (4) TRANSFER TIME (BOTH DIRECTIONS)
      (5) CONTACT BOUNCE TIME (BOTH DIRECTIONS)
      (6) NUMBER OF RELAYS SUBJECTED TO MISS TEST.
      (7) NUMBER OF RELAYS FAILING MISS TEST.
      (8) TIME OR CYCLES TO FAILURE OF FAILED UNITS.
   C. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION:
      (1) PURCHASE ORDER NUMBER
      (2) NASA PART NUMBER
      (3) QUANTITY AND DATE OF SHIPMENT
      (4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR THE PURCHASE ORDER.

Ⓖ REPLACES REV F WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN C. Crespi DATE 28 Aug 63
CHECKED J Ruggen
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006772
SCALE NONE	WT	SHEET 2 OF 2

MASTER

1006772 K

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sep 63	WK
H	REVISED PER TDRR 04002	17 Oct 63	WK
J	REVISED PER TDRR 15736	2/2/65	WK
K	REVISED PER TDRR 17270	18 Mar 65	WK

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL: SEE TABLE
   (a) KOVAR: IRON-NICKEL-COBALT ALLOY PER PS 1015402
   (b) ALLOY (52): CHEMICAL COMPOSITION: 51-53% NI, 44-48% FE, .75-1.25% MN, .15% MAX C .5% MAX SI, .015% MAX S. GOLD PLATE PER PS 1015401

(2) MARKING:
   (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:
      NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
      DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
      DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.
      MUST OPERATE CURRENT, MAXIMUM.
      SCHEMATIC DIAGRAM.
      BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.
   (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.

(3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. TERMINAL SPACING SHALL BE REFERENCED TO ℄ OF HEADER.

(4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

C. ELECTRICAL REQUIREMENTS:

(1) COIL CURRENT: MUST-OPERATE (EITHER DIRECTION) IN ACCORDANCE WITH TABLE I.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH: Ⓜ
   (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN Ⓜ EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.

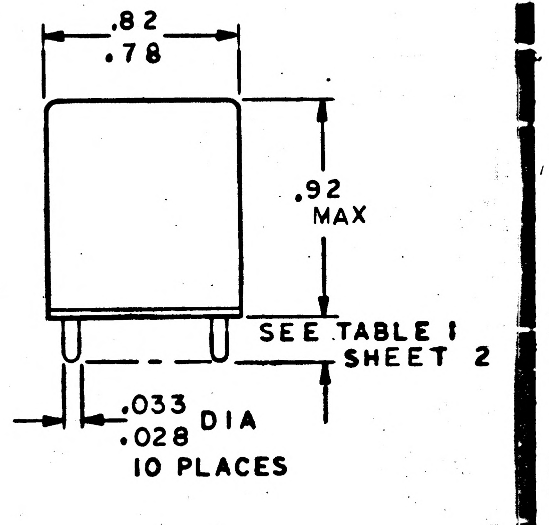
(5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

(6) OPERATE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.

(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

(8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.

(9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.



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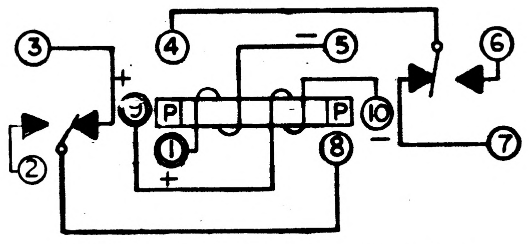
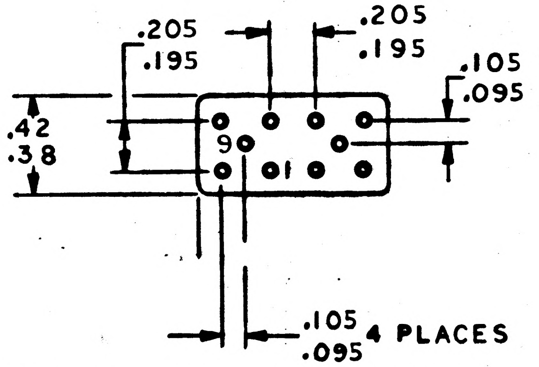
(FOR REFERENCE ONLY)



+ VOLTAGE ON 1 OR 9 CLOSES SWITCH AS SHOWN



Ⓖ REPLACES REV F WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
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DWG. NO. CONTRACT

DRAWN C. Craspi DATE 29 Aug 63
CHECKED J. Ruggiero
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006772
SCALE NONE	WT	SHEET 1 OF 2

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sept 63	WJR
H	REVISED PER TDRR 04002	17 Oct 63	WR
J	REVISED PER TDRR 15736	2/2/65	WR
K	REVISED PER TDRR 17270	18 May 65	WR

ICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY TED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERN- T THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR Y WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER NSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEY- ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY NTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

TES (CONTINUED)

DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 0.75 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

DASH NO.	COIL RES @ 25°C OHMS MIN-MAX	MUST OPERATE CURRENT MADC MAX (EITHER DIRECTION)	MAX CONT CURRENT MADC AT 125 °C	SUGGESTED SOURCE VOLTAGE DC	LEAD LENGTH MAX/MIN	CORE PULL IN POWER SENSITIVITY NOMINAL MW	LEAD MATERIAL
1	270-374	22.6	32.0	12	.260/.240	150	KOVAR
2	178-242	30	60	10	.260/.240	150	KOVAR
3	1020-1380	9.0	25	26.5	- /1.00	100	KOVAR
-4	270-374	22.6	32.0	12	.260/.240	150	ALLOY (52) GOLD PLATED
-5	178-242	30	60	10	.260/.240	150	ALLOY (52) GOLD PLATED
-6	1020-1380	9.0	25	26.5	-/1.00	100	ALLOY (52) GOLD PLATED

5. VENDOR SUPPLIED DATA:

A. CERTIFICATE OF COMPLIANCE FOR SPECIFIC LEAD MATERIAL

B. BEFORE-AND-AFTER-MISS-TEST READINGS FOR:

(1) MUST - OPERATE CURRENT (BOTH DIRECTIONS)
(2) CONTACT RESISTANCE
(3) OPERATE TIME (BOTH DIRECTIONS)
(4) TRANSFER TIME (BOTH DIRECTIONS)
(5) CONTACT BOUNCE TIME (BOTH DIRECTIONS)
(6) NUMBER OF RELAYS SUBJECTED TO MISS TEST.
(7) NUMBER OF RELAYS FAILING MISS TEST.
(8) TIME OR CYCLES TO FAILURE OF FAILED UNITS.

C. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION:

(1) PURCHASE ORDER NUMBER
(2) NASA PART NUMBER
(3) QUANTITY AND DATE OF SHIPMENT
(4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR THE PURCHASE ORDER.

Ⓖ REPLACES REV F WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Cooper DATE 28 Aug 63
CHECKED J. Rogers
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 5/5/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006772 L

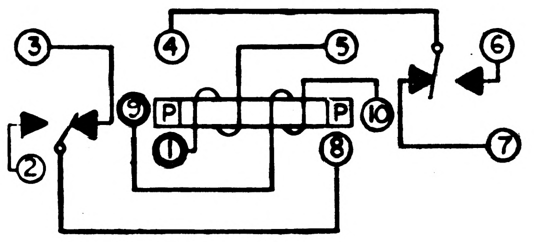
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sep 63	WK
H	REVISED PER TDRR 04002	17 Oct 63	WK
J	REVISED PER TDRR 15736	2/2/65	WK
K	REVISED PER TDRR 17270	18 Mar 65	WK
L	REVISED PER TDRR 29125		

NOTES:

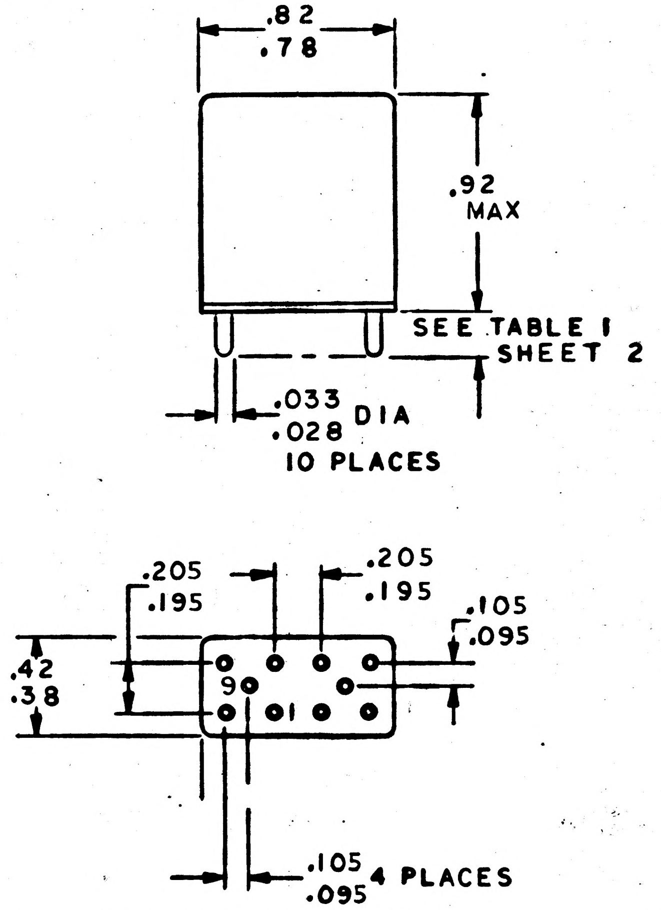
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
2. ACCEPTANCE AND INSPECTION:
   - A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.
   - B. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: PER TABLE
       - (a) KOVAR: IRON-NICKEL-COBALT ALLOY PER PS 1015402
       - (b) ALLOY (52): CHEMICAL COMPOSITION: 51-53% NI, 44-48% FE, .75-1.25% MN, .15% MAX C .5% MAX SI, .015% MAX S. GOLD PLATE PER PS 1015401
     - (2) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:
         - NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
         - DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
         - DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.
         - MUST OPERATE CURRENT, OR MUST OPERATE VOLTAGE, MAXIMUM.
         - SCHEMATIC DIAGRAM.
         - BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.
       - (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.
     - (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. TERMINAL SPACING SHALL BE REFERENCED TO ℄ OF HEADER.
     - (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED. THE LEAK RATE SHALL BE AT LEAST 10^{-8} CC PER SECOND AT ONE ATMOSPHERE PRESSURE DIFFERENTIAL.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) COIL CURRENT: MUST-OPERATE PARAMETERS (EITHER DIRECTION): IN ACCORDANCE WITH TABLE I FOR CURRENT-ADJUSTED RELAYS, TABLE II FOR VOLTAGE-ADJUSTED RELAYS.
     - (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I OR TABLE II.
     - (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.
     - (4) DIELECTRIC STRENGTH:
       - (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.
     - (6) OPERATE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.
     - (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.
     - (8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.
     - (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SCHEMATIC
(FOR REFERENCE ONLY)



+ VOLTAGE ON 1 CLOSES SWITCH AS SHOWN: +VOLTAGE ON 10 REVERSES CONTACTS



Ⓖ REPLACES REV F WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB Cambridge, Mass. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL SEE NOTES	DRAWN C. Craig DATE 29 Aug 63 CHECKED J. Ruggiero APPROVAL APPROVAL Eldon C Hall 5 Sept 63	RELAY, ARMATURE, MAGNETIC LATCHING SPECIFICATION CONTROL DRAWING
		HEAT TREATMENT	NASA APPROVAL 9/5/63	CODE IDENT NO. SIZE C NASA DRAWING NO. 1006772
		FINAL FINISH	MIT APPROVAL W Kupfer 5 Sep 63	SCALE NONE WT SHEET 1 OF 3

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sept 63	WJK
H	REVISED PER TDRR 04002	17 Oct 63	WK
J	REVISED PER TDRR 15736	2/2/65	WK
K	REVISED PER TDRR 17270	18 Mar 65	WK
L	REVISED PER TDRR 29125		

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I OR II.

(2) COIL POWER: 0.75 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I OR II.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I OR II.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

(3) CASE: CASE MATERIAL SHALL BE CUPRO-NICKEL. CASE-TO-HEADER CONSTRUCTION SHALL BE:

(a) FOR ITEMS -1 TO -6: SOLDERED

(b) FOR ITEMS -7: WELDED

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

TABLE II

DASH NO.	COIL RES ● 25°C	MUST-OPERATE VOLTAGE ● 25°C	MUST OPERATE VOLTAGE ● 125°C	NOMINAL RATED COIL VOLTAGE	LEAD LENGTH	PULL-IN PWR MW	LEAD MATERIAL	SPECIAL CONDITIONING	MAX CONT CURRENT MADC ●120°C
-7	270 - 330	6.8	9.5	12	.260/.240	150	ALLOY (52) GOLD PLATED	PER PARA 4.B	32.0

TABLE I

DASH NO.	COIL RES ● 25°C OHMS MIN-MAX	MUST OPERATE CURRENT MADC MAX (EITHER DIRECTION)	MAX CONT CURRENT MADC AT 125 °C	SUGGESTED SOURCE VOLTAGE DC	LEAD LENGTH MAX/MIN	CORE PULL IN POWER SENSITIVITY NOMINAL MW	LEAD MATERIAL	SPECIAL CONDITIONING
1	270-374	22.6	32.0	12	.260/.240	150	KOVAR	PER PARA 4.A
2	178-242	30	60	10	.260/.240	150	KOVAR	
3	1020-1380	9.0	25	26.5	- /1.00	100	KOVAR	
-4	270-374	22.6	32.0	12	.260/.240	150	ALLOY (52) GOLD PLATED	
-5	178-242	30	60	10	.260/.240	150	ALLOY (52) GOLD PLATED	
-6	1020-1380	9.0	25	26.5	-/1.00	100	ALLOY (52) GOLD PLATED	

5. VENDOR SUPPLIED DATA:

A. CERTIFICATE OF COMPLIANCE FOR SPECIFIC LEAD MATERIAL

B. BEFORE-AND-AFTER-MISS-TEST READINGS FOR:

(1) MUST - OPERATE CURRENT (BOTH DIRECTIONS)
(2) CONTACT RESISTANCE
(3) OPERATE TIME (BOTH ~~DIRECTIONS~~)
(4) TRANSFER TIME (BOTH DIRECTIONS)
(5) CONTACT BOUNCE TIME (BOTH DIRECTIONS)
(6) NUMBER OF RELAYS SUBJECTED TO MISS TEST.
(7) NUMBER OF RELAYS FAILING MISS TEST.
(8) TIME OR CYCLES TO FAILURE OF FAILED UNITS.

} THIS REQUIREMENT FOR PARTS -1 THRU -6 ONLY.

C. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION:

(1) PURCHASE ORDER NUMBER
(2) NASA PART NUMBER
(3) QUANTITY AND DATE OF SHIPMENT
(4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR THE PURCHASE ORDER.

Ⓖ REPLACES REV F WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Coope DATE 28 Aug 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL 5 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 2 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006772 L

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
L		THIS SHEET ADDED PER TDRR 29125				

NOTES:

4. SPECIAL CONDITIONING: (CONTINUED)

   B. ALTERNATE SPECIAL CONDITIONING: THE MANUFACTURER SHALL SUBJECT ALL RELAYS TO THE FOLLOWING SEQUENCE OF TESTS:

      (1) HIGH TEMPERATURE MISS TEST: THE RELAYS SHALL BE SUBJECTED TO +125°C WITH THE RATED COIL VOLTAGE PER TABLE I APPLIED FOR ONE HOUR PER COIL (TOTAL SOAK TIME IS 7 HOURS). RELAYS SHALL THEN BE OPERATED AT RATED COIL VOLTAGE FOR 2000 CYCLES AT A RATE OF 1 TO 7 CYCLES PER SECOND. CONTACT LOADING SHALL BE 30 MICROAMPS WITH A MAXIMUM OPEN CIRCUIT VOLTAGE OF 50 MILLIVOLTS. CONTACT RESISTANCE SHALL BE MONITORED CONTINUOUSLY AND SHALL NOT EXCEED 50 OHMS.

      (2) INTERNAL MOISTURE TEST: FOLLOWING THE HIGH TEMPERATURE TEST, AND WHILE STILL AT +125°C, THE RELAYS SHALL BE ENERGIZED WITH RATED COIL VOLTAGE ON TERMINAL 10 WHILE THE TEMPERATURE OF THE CHAMBER IS LOWERED TO -65°C. AFTER REACHING THIS TEMPERATURE, THE RELAY SHALL BE CONDITIONED WHILE ENERGIZED FOR ONE HOUR. AT THE END OF THIS PERIOD, THE RELAY COIL SHALL BE DE-ENERGIZED AND RATED COIL VOLTAGE APPLIED TO TERMINAL #10 AND THE CONTACT RESISTANCE OF THE CLOSED CONTACTS SHALL BE MEASURED USING 100 MILLIAMPS FROM A 6 VOLT SOURCE. THE RESISTANCE SHALL NOT EXCEED 1 OHM.

      (3) LOW TEMPERATURE TEST: FOLLOWING THE INTERNAL MOISTURE TEST, THE RELAYS SHALL BE SUBJECTED TO -65°C FOR TWO HOURS WITH NO COIL VOLTAGE APPLIED. RELAYS SHALL THEN BE SUBJECTED TO THE MISS TEST AS SPECIFIED IN PARA 4.A.(1).

      (4) DISPOSITION OF RELAYS WITH HIGH CONTACT RESISTANCE: ALL RELAYS EXHIBITING A CONTACT RESISTANCE OF MORE THAN 50 OHMS IN PARA 4.A.(1) AND 4.A.(3) TESTS SHALL BE REJECTED AND ANALYZED TO DETERMINE CAUSE. THE PURCHASER SHALL BE INFORMED OF THE NUMBER OF UNITS IN EACH LOT WHICH FAIL THESE TESTS.

      (5) PULSED OPERATION TEST: ALL RELAYS SHALL BE TESTED FOR CORRECT OPERATION UNDER THE FOLLOWING CONDITIONS:

         (a) A POSITIVE 6 VDC PULSE SHALL BE ALTERNATELY APPLIED TO TERMINALS 1 AND 1C. PULSE WIDTH SHALL BE 10 MILLISECONDS.

         (b) RELAY SHALL BE ACTIVATED TO TIMES IN EACH DIRECTION.

         (c) CONTACT LOAD SHALL BE A HIGH IMPEDANCE NEON BULB FOR EACH STATIONARY CONTACT FOR VISUAL INDICATION OF CONTACT CLOSURE.

Ⓛ THIS SHEET ADDED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 1 JUN 1966
CHECKED 2 JUN 66
APPROVED
APPROVED
APPROVED MIT 6-7-66
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006772
SCALE NONE
SHEET 3 OF 3

1006772 M

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J	REVISED PER TDRR 15736	2/2/65	WK
K	REVISED PER TDRR 17270	18 [illegible] 65	WK
L	REVISED PER TDRR 29125		[illegible]
M	REVISED PER TDRR 29881	13 JUL 66	RWH

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL: PER TABLE
- (a) KOVAR: IRON-NICKEL-COBALT ALLOY PER PS 1015402
- (b) ALLOY (52): CHEMICAL COMPOSITION: 51-53% NI, 44-48% FE, .75-1.25% MN, .15% MAX C .5% MAX SI, .015% MAX S. GOLD PLATE PER PS 1015401

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:

NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
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BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.

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C. ELECTRICAL REQUIREMENTS:

(1) COIL CURRENT: MUST-OPERATE PARAMETERS (EITHER COIL): IN ACCORDANCE WITH TABLE I FOR CURRENT-ADJUSTED RELAYS, TABLE II FOR VOLTAGE-ADJUSTED RELAYS.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I OR TABLE II.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH:

(a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.

(5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

(6) OPERATE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I OR II.

(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

(8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.

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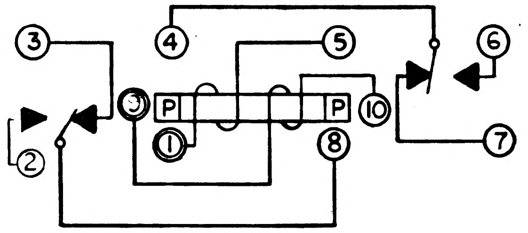

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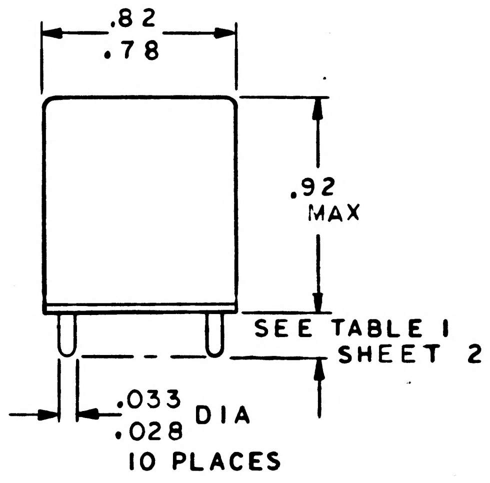

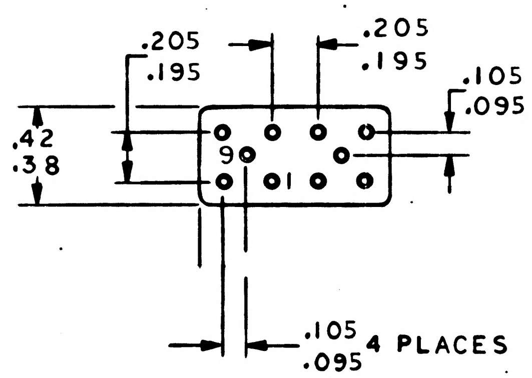

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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 29 Aug 63
CHECKED J. Ruggiero
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 1 OF 3

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L	REVISED PER TDRR 29125		
M	REVISED PER TDRR 29881	13 JUL 66	RWH

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I OR II.

(2) COIL POWER: 0.75 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I OR II.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I OR II.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

(3) CASE: CASE MATERIAL SHALL BE CUPRO-NICKEL. CASE-TO-HEADER CONSTRUCTION SHALL BE:

(a) FOR ITEMS -1 TO -6: SOLDERED

(b) FOR ITEMS -7: WELDED

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

TABLE II

DASH NO.	COIL RES ● 25°C	MUST-OPERATE VOLTAGE ● 25°C	MUST OPERATE VOLTAGE ● 125°C	NOMINAL RATED COIL VOLTAGE	LEAD LENGTH	PULL-IN PWR NOMINAL MW	LEAD MATERIAL	SPECIAL CONDITIONING	MAX CONT CURRENT MADC ●120°C
-7	270 - 330	6.8	9.5	12	.260/.240	150	ALLOY (52) GOLD PLATED	PER PARA 4.B	32.0

TABLE I

DASH NO.	COIL RES ● 25°C OHMS MIN-MAX	MUST OPERATE CURRENT MADC MAX (EITHER COIL)	MAX CONT CURRENT MADC AT 125 °C	SUGGESTED SOURCE VOLTAGE DC	LEAD LENGTH MAX/MIN	CORE PULL IN POWER SENSITIVITY NOMINAL MW	LEAD MATERIAL	SPECIAL CONDITIONING
1	270-374	22.6	32.0	12	.260/.240	150	KOVAR	PER PARA 4.A
2	178-242	30	60	10	.260/.240	150	KOVAR	
3	1020-1380	9.0	25	26.5	- /1.00	100	KOVAR	
-4	270-374	22.6	32.0	12	.260/.240	150	ALLOY (52) GOLD PLATED	
-5	178-242	30	60	10	.260/.240	150	ALLOY (52) GOLD PLATED	
-6	1020-1380	9.0	25	26.5	-/1.00	100	ALLOY (52) GOLD PLATED	

5. VENDOR SUPPLIED DATA:

A. CERTIFICATE OF COMPLIANCE FOR SPECIFIC LEAD MATERIAL

B. BEFORE-AND-AFTER-MISS-TEST READINGS FOR:

(1) MUST - OPERATE CURRENT (BOTH DIRECTIONS)
(2) CONTACT RESISTANCE
(3) OPERATE TIME (BOTH DIRECTIONS)
(4) TRANSFER TIME (BOTH DIRECTIONS)
(5) CONTACT BOUNCE TIME (BOTH DIRECTIONS)
(6) NUMBER OF RELAYS SUBJECTED TO MISS TEST.
(7) NUMBER OF RELAYS FAILING MISS TEST.
(8) TIME OR CYCLES TO FAILURE OF FAILED UNITS.

} THIS REQUIREMENT FOR PARTS -1 THRU -6 ONLY.

C. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION:

(1) PURCHASE ORDER NUMBER
(2) NASA PART NUMBER
(3) QUANTITY AND DATE OF SHIPMENT
(4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR THE PURCHASE ORDER.

Ⓖ REPLACES REV F WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 28 Aug 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/3/63
MIT APPROVAL W. Suffen 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 2 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
(M) L		THIS SHEET ADDED PER TDRR 29125				
M		REVISED PER TDRR 29881	RWH		13 JUL 66	

NOTES:

4. SPECIAL CONDITIONING: (CONTINUED)

   B. ALTERNATE SPECIAL CONDITIONING: THE MANUFACTURER SHALL SUBJECT ALL RELAYS TO THE FOLLOWING SEQUENCE OF TESTS:

      (1) HIGH TEMPERATURE MISS TEST: THE RELAYS SHALL BE SUBJECTED TO +125°C WITH THE SUGGESTED SOURCE VOLTAGE PER TABLE II APPLIED FOR ONE HOUR PER COIL (TOTAL SOAK TIME IS 7 HOURS). RELAYS SHALL THEN BE OPERATED AT RATED COIL VOLTAGE FOR 2000 CYCLES AT A RATE OF 1 TO 7 CYCLES PER SECOND. CONTACT LOADING SHALL BE 30 MICROAMPS WITH A MAXIMUM OPEN CIRCUIT VOLTAGE OF 50 MILLIVOLTS. CONTACT RESISTANCE SHALL BE MONITORED CONTINUOUSLY AND SHALL NOT EXCEED 50 OHMS.

      (2) INTERNAL MOISTURE TEST: FOLLOWING THE HIGH TEMPERATURE TEST, AND WHILE STILL AT +125°C, THE RELAYS SHALL BE ENERGIZED WITH RATED COIL VOLTAGE ON TERMINAL 10 WHILE THE TEMPERATURE OF THE CHAMBER IS LOWERED TO -65°C. AFTER REACHING THIS TEMPERATURE, THE RELAY SHALL BE CONDITIONED WHILE ENERGIZED FOR ONE HOUR. AT THE END OF THIS PERIOD, THE RELAY COIL SHALL BE DE-ENERGIZED AND RATED COIL VOLTAGE APPLIED TO TERMINAL #10 AND THE CONTACT RESISTANCE OF THE CLOSED CONTACTS SHALL BE MEASURED USING 100 MILLIAMPS FROM A 6 VOLT SOURCE. THE RESISTANCE SHALL NOT EXCEED 1 OHM.

      (3) LOW TEMPERATURE TEST: FOLLOWING THE INTERNAL MOISTURE TEST, THE RELAYS SHALL BE SUBJECTED TO -65°C FOR TWO HOURS WITH NO COIL VOLTAGE APPLIED. RELAYS SHALL THEN BE SUBJECTED TO THE MISS TEST AS SPECIFIED IN PARA 4.B.(1).

      (4) DISPOSITION OF RELAYS WITH HIGH CONTACT RESISTANCE: ALL RELAYS EXHIBITING A CONTACT RESISTANCE OF MORE THAN 50 OHMS IN PARA 4.B.(1) AND 4.B.(3) TESTS SHALL BE REJECTED AND ANALYZED TO DETERMINE CAUSE. THE PURCHASER SHALL BE INFORMED OF THE NUMBER OF UNITS IN EACH LOT WHICH FAIL THESE TESTS.

      (5) PULSED OPERATION TEST: ALL RELAYS SHALL BE TESTED FOR CORRECT OPERATION UNDER THE FOLLOWING CONDITIONS:

         (a) AT 25°C, A POSITIVE 6VDC PULSE SHALL BE ALTERNATELY APPLIED TO TERMINALS 1 AND 1C. PULSE WIDTH SHALL BE 15 MILLISECONDS.

         (b) RELAY SHALL BE ACTIVATED TO TIMES IN EACH DIRECTION.

         (c) CONTACT LOAD SHALL BE A HIGH IMPEDANCE NEON BULB FOR EACH STATIONARY CONTACT FOR VISUAL INDICATION OF CONTACT CLOSURE.

Ⓛ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Kal Simpson 1 JUN 1966
CHECKED 2 JUN 66
APPROVED
APPROVED
APPROVED MIT 6-7-66
APPROVED MSC A. C. METZGER
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
DRAWING NO. 1006772
SCALE NONE
SHEET 3 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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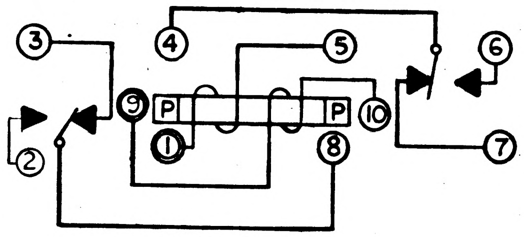
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sep 63	WK
H	REVISED PER TDRR 04002	17 Oct 63	WK
J	REVISED PER TDRR 15736	2/2/65	WK
K	REVISED PER TDRR 17270	18 Mar 65	WK
L	REVISED PER TDRR 29125		
M	REVISED PER TDRR 29881	13 JUL 66	RWH
N	REVISION STATUS CHANGED	10 FEB 67	EC

NOTES:

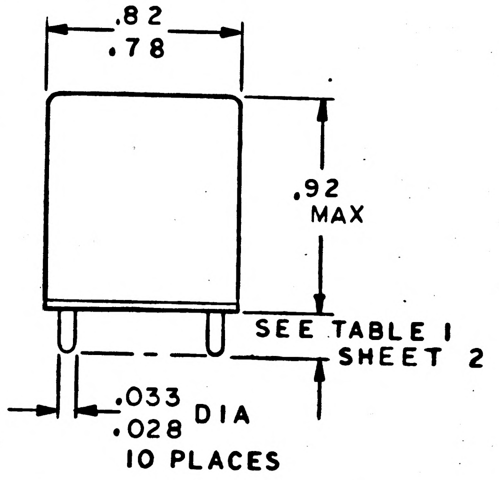
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL EXCEPT AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
2. ACCEPTANCE AND INSPECTION:
   - A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.
   - B. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: PER TABLE
       - (a) KOVAR: IRON-NICKEL-COBALT ALLOY PER PS 1015402
       - (b) ALLOY (52): CHEMICAL COMPOSITION: 51-53% N1, 44-48% FE, .75-1.25% MN, .15% MAX C .5% MAX SI, .015% MAX S. GOLD PLATE PER PS 101540T
     - (2) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:
         - NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
         - DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
         - DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE.
         - MUST OPERATE CURRENT, OR MUST OPERATE VOLTAGE, MAXIMUM.
         - SCHEMATIC DIAGRAM.
         - BLUE BEADING AROUND TERMINALS 1 AND 9 OR A RED DOT BETWEEN TERMINALS 2 AND 3.
       - (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.
     - (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. TERMINAL SPACING SHALL BE REFERENCED TO ℄ OF HEADER.
     - (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED. THE LEAK RATE SHALL BE NOT MORE THAN 10^{-8} CC PER SECOND AT ONE ATMOSPHERE PRESSURE DIFFERENTIAL.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) COIL CURRENT: MUST-OPERATE PARAMETERS (EITHER COIL): IN ACCORDANCE WITH TABLE I FOR CURRENT-ADJUSTED RELAYS, TABLE II FOR VOLTAGE-ADJUSTED RELAYS.
     - (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I OR TABLE II.
     - (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.
     - (4) DIELECTRIC STRENGTH:
       - (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME
     - (6) OPERATE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I OR II.
     - (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.
     - (8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.
     - (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

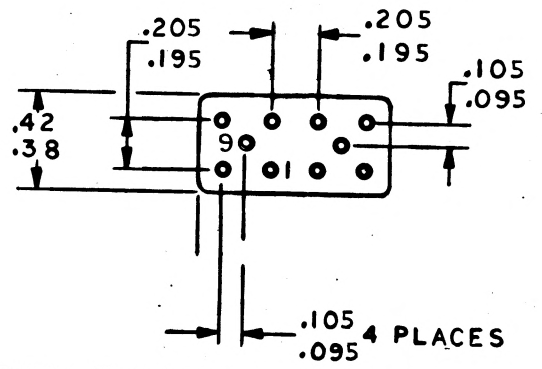
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SCHEMATIC
(FOR REFERENCE ONLY)



+ VOLTAGE ON 1 CLOSES SWITCH AS SHOWN: +VOLTAGE ON 10 REVERSES CONTACTS





Ⓖ REPLACES REV F WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. Crespi DATE 29 Aug 63
CHECKED J. Ruggiero
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

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RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006772
SCALE NONE | WT | SHEET 1 OF 3

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
N	REVISION STATUS CHANGED	10 FEB 67	EC	

N 1006772

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGES PER TDRR 02965	5 Sept 63	WJK
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K	REVISED PER TDRR 17270	18 Mar 65	WK
L	REVISED PER TDRR 29125		
M	REVISED PER TDRR 29881	13 JUL 66	RWH

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I OR II.

(2) COIL POWER: 0.75 WATTS MAXIMUM PER COIL AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT PER COIL AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I OR II.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY): IN ACCORDANCE WITH TABLE I OR II.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE); DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC LATCHING ACTION.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

(3) CASE: CASE MATERIAL SHALL BE CUPRO-NICKEL. CASE-TO-HEADER CONSTRUCTION SHALL BE:

(a) FOR ITEMS -1 TO -6: SOLDERED

(b) FOR ITEMS -7: WELDED

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

TABLE II

DASH NO.	COIL RES ● 25°C	MUST-OPERATE VOLTAGE ● 25°C	MUST OPERATE VOLTAGE ● 125°C	NOMINAL RATED COIL VOLTAGE	LEAD LENGTH	PULL-IN PWR NOMINAL MW	LEAD MATERIAL	SPECIAL CONDITIONING	MAX CONT CURRENT MADC ●120°C
-7	270 - 330	6.8	9.5	12	.260/.240	150	ALLOY (52) GOLD PLATED	PER PARA 4.B	32.0

TABLE I

DASH NO.	COIL RES ● 25°C OHMS MIN-MAX	MUST OPERATE CURRENT MADC MAX (EITHER COIL)	MAX CONT CURRENT MADC AT 125 °C	SUGGESTED SOURCE VOLTAGE DC	LEAD LENGTH MAX/MIN	CORE PULL IN POWER SENSITIVITY NOMINAL MW	LEAD MATERIAL	SPECIAL CONDITIONING
1	270-374	22.6	32.0	12	.260/.240	150	KOVAR	PER PARA 4.A
2	178-242	30	60	10	.260/.240	150	KOVAR	
3	1020-1380	9.0	25	26.5	- /1.00	100	KOVAR	
-4	270-374	22.6	32.0	12	.260/.240	150	ALLOY (52) GOLD PLATED	
-5	178-242	30	60	10	.260/.240	150	ALLOY (52) GOLD PLATED	
-6	1020-1380	9.0	25	26.5	-/1.00	100	ALLOY (52) GOLD PLATED	

5. VENDOR SUPPLIED DATA:

A. CERTIFICATE OF COMPLIANCE FOR SPECIFIC LEAD MATERIAL

B. BEFORE-AND-AFTER-MISS-TEST READINGS FOR:

(1) MUST - OPERATE CURRENT (BOTH DIRECTIONS)
(2) CONTACT RESISTANCE
(3) OPERATE TIME (BOTH DIRECTIONS)
(4) TRANSFER TIME (BOTH DIRECTIONS)
(5) CONTACT BOUNCE TIME (BOTH DIRECTIONS)
(6) NUMBER OF RELAYS SUBJECTED TO MISS TEST.
(7) NUMBER OF RELAYS FAILING MISS TEST.
(8) TIME OR CYCLES TO FAILURE OF FAILED UNITS.

} THIS REQUIREMENT FOR PARTS -1 THRU -6 ONLY.

C. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION:

(1) PURCHASE ORDER NUMBER
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LIST OF MATERIALS

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APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. Cooper DATE 28 Aug 63
CHECKED J. Ruggen
APPROVAL
APPROVAL Eldon C Hall, 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W. Jeffers 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE NONE
WT
SHEET 2 OF 3

N 1006772

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
Ⓜ L		THIS SHEET ADDED PER TDRR 29125				
Ⓜ M		REVISED PER TDRR 29881	RWH		13 JUL 66	
N		REVISED PER TDRR 32868	EC		10 FEB 67	

NOTES:

4. SPECIAL CONDITIONING: (CONTINUED)

   B. THE MANUFACTURER SHALL SUBJECT ALL RELAYS TO THE FOLLOWING SEQUENCE OF TESTS:

      (1) HIGH TEMPERATURE MISS TEST: THE RELAYS SHALL BE SUBJECTED TO +125°C WITH THE NOMINAL RATED COIL VOLTAGE PER TABLE II APPLIED FOR ONE HOUR PER COIL (TOTAL SOAK TIME IS 2 HOURS). RELAYS SHALL THEN BE OPERATED AT RATED COIL VOLTAGE FOR 2000 CYCLES AT A RATE OF 1 TO 7 CYCLES PER SECOND. CONTACT LOADING SHALL BE 30 MICROAMPS WITH A MAXIMUM OPEN CIRCUIT VOLTAGE OF 50 MILLIVOLTS. CONTACT RESISTANCE SHALL BE MONITORED CONTINUOUSLY AND SHALL NOT EXCEED 50 OHMS.

      * (2) INTERNAL MOISTURE TEST: FOLLOWING THE HIGH TEMPERATURE TEST, AND WHILE STILL AT +125°C, THE RELAYS SHALL BE ENERGIZED WITH RATED COIL VOLTAGE ON TERMINAL 10 WHILE THE TEMPERATURE OF THE CHAMBER IS LOWERED TO -65°C. AFTER REACHING THIS TEMPERATURE, THE RELAY SHALL BE CONDITIONED WHILE ENERGIZED FOR ONE HOUR. AT THE END OF THIS PERIOD, THE RELAY COIL SHALL BE DE-ENERGIZED AND RATED COIL VOLTAGE APPLIED TO TERMINAL # 1 AND THE CONTACT RESISTANCE OF THE CLOSED CONTACTS SHALL BE MEASURED USING 100 MILLIAMPS FROM A 6 VOLT SOURCE. THE RESISTANCE SHALL NOT EXCEED 1 OHM.

      (3) LOW TEMPERATURE TEST: FOLLOWING THE INTERNAL MOISTURE TEST, THE RELAYS SHALL BE SUBJECTED TO -65°C FOR TWO HOURS WITH NO COIL VOLTAGE APPLIED. RELAYS SHALL THEN BE SUBJECTED TO THE MISS TEST AS SPECIFIED IN PARA 4.B.(1).

      (4) DISPOSITION OF RELAYS WITH HIGH CONTACT RESISTANCE: ALL RELAYS EXHIBITING A CONTACT RESISTANCE OF MORE THAN 50 OHMS IN PARA 4.B.(1) AND 4.B.(3) TESTS SHALL BE REJECTED AND ANALYZED TO DETERMINE CAUSE. THE PURCHASER SHALL BE INFORMED OF THE NUMBER OF UNITS IN EACH LOT WHICH FAIL THESE TESTS.

      * (5) PULSED OPERATION TEST: ALL RELAYS SHALL BE TESTED FOR CORRECT OPERATION UNDER THE FOLLOWING CONDITIONS:

         (a) AT 25°C, A POSITIVE 6.8VDC PULSE SHALL BE ALTERNATELY APPLIED TO TERMINALS 1 AND 10. PULSE WIDTH SHALL BE 15 MILLISECONDS.

         (b) RELAY SHALL BE ACTIVATED 10 TIMES IN EACH DIRECTION.

         (c) CONTACT LOAD SHALL BE A HIGH IMPEDANCE NEON BULB FOR EACH STATIONARY CONTACT FOR VISUAL INDICATION OF CONTACT CLOSURE.

* REFER TO SCHEMATIC ON PAGE 1 FOR ELECTRICAL CONNECTIONS.

Ⓛ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

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INSTRUMENTATION LAB
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN K. Simpson 1 JUN 1966
CHECKED 2 JUN 66
APPROVED
APPROVED
APPROVED MIT 6-7-66
APPROVED MSC A. C. METZGER
DATE

RELAY, ARMATURE,
MAGNETIC LATCHING
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006772
SCALE NONE		SHEET 3 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA
ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY
RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERN-
MENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER;
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ING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY
PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. GENERAL REQUIREMENTS: SHALL MEET MIL-R-5757 WITH THE FOLLOWING QUALIFICATIONS.
   - A. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC LATCHING ACTION.
   - B. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS PER ND 1015402 AND SILVER CONTACTS.
   - C. SEAL: HERMETICALLY SEALED.
   - D. LEAD PULL: 3.0 ± 0.3 POUNDS.
   - E. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINALS ONE AND NINE.
2. ELECTRICAL REQUIREMENTS:
   - A. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.
   - B. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.
   - C. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.
   - D. COIL POWER, PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.
   - E. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.
   - F. CONTACT CURRENT RATING: 2 AMPERES AT 28 VDC OR 120 VAC RESISTIVE LOAD.
   - G. CONTACT RESISTANCE: 0.05 OHMS MAX AT 1 AMP AND 6 VOLTS.
   - H. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.
   - J. TIME, TRANSFER: 1 MILLISECOND MAX.
   - K. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.
   - L. TIME, CONTACT CHATTER: NONE WHEN TESTED PER PARAGRAPH 4.D. OR 4.E.
   - M. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC FOR 5 SECONDS BETWEEN OPEN CONTACTS.
   - N. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC FOR 5 SECONDS WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.
   - P. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN-
     - (a) MUTUALLY INSULATED TERMINALS
     - (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
     - (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
     - (d) CONTACTS AND FRAME
3. RELIABILITY REQUIREMENT:
   - A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE TEMPERATURE RANGE AND AT THE RATED RESISTIVE LOAD.
   - B. RUN-IN: EVERY RELAY SHALL BE SUCCESSFULLY RUN FOR 5000 ON-OFF CYCLES WITHOUT OPENS, SHORTS, OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS.
   - C. DOCUMENTATION, TIME (OR CYCLES) TO FAILURE: A CERTIFIED TABULATION OF THE RUN-IN TEST LOTS SHALL BE FURNISHED WITH EACH SHIPMENT ENUMERATING THE TOTAL NUMBER OF RELAYS TESTED, THE NUMBER THAT FAILED, AND THE TIME (OR CYCLES) TO FAILURE.
4. ENVIRONMENTAL REQUIREMENTS:
   - A. HUMIDITY (MOISTURE RESISTANCE): UP TO 100% RH.
   - B. OPERATING TEMP RANGE: -65°C TO +125°C.
   - C. THERMAL SHOCK: -65°C TO +125°C.
   - D. VIBRATION: .195 INCH DA OR ± 30 G (WHICHEVER IS LESS) FROM 10 TO 5000 CPS.
   - E. SHOCK: 100 G FOR 6 MILLISECONDS.
5. QUALITY ASSURANCE PROVISIONS: THE PROVISIONS OF MIL-R-5757 AND SECTION I OF ND 1015404 SHALL APPLY IN ADDITION TO THOSE LISTED.
   - A. EARLY FAILURE: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE CONTACT LOAD OF FROM 0.5 TO 0.8 AMPERES AT 30 VDC. THERE SHALL BE NO MISSES, OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 100 MILLIOHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.

FOR SOURCE OF SUPPLY:
SEE QUALIFIED VENDOR LIST
ND.

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00165 DATE
12/12/62

REV-	REV-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

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DWG. NO.
CONTRACT
DRAWN J. A. Faffini DATE 6 NOV 62
CHECKED D. M. Slupi 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE —
WT SEE SHEET 2
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

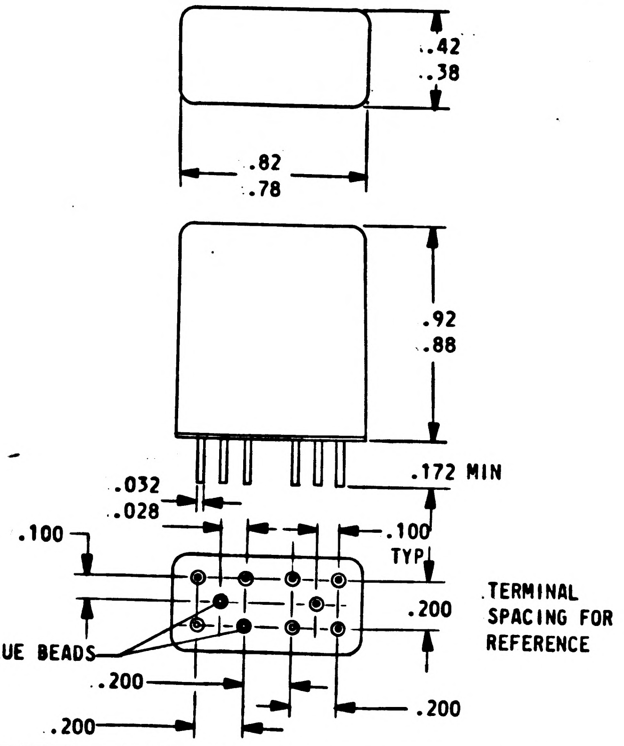
1006772

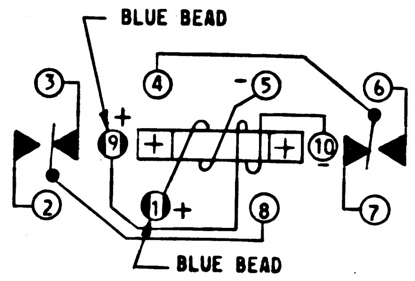
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

DASH NO.	MFR PART NO.	COIL RES OHMS ±10%	PULL -IN MADC (MAX)	DROP-OUT MADC (MIN)	MAX CONT CURRENT MADC AT 125°C	SUGGESTED SOURCE VOLTAGE DC	APPROX SENSITIVITY MILLIWATTS
-1	97273	325	17.5	MUST HAVE OPPOSITE POLARITY OF SAME MAGNITUDE	32.0	12	100

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 12/12/62 DATE





ELECTRICAL SCHEMATIC
+ VOLTAGE ON TERM.
NO. 1 OR NO. 9 CLOSES
CONTACTS AS SHOWN

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
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DECIMALS ± —
ANGLES ± —
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CHECKED D. M. [illegible] 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W. J. Rhine 12-12-62
MIT APPROVAL [illegible] 12/12/62

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RELAYS, MAGNETIC LATCHING, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006772
SCALE 2/1
WT ACT. .044 LB MAX
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006773 A

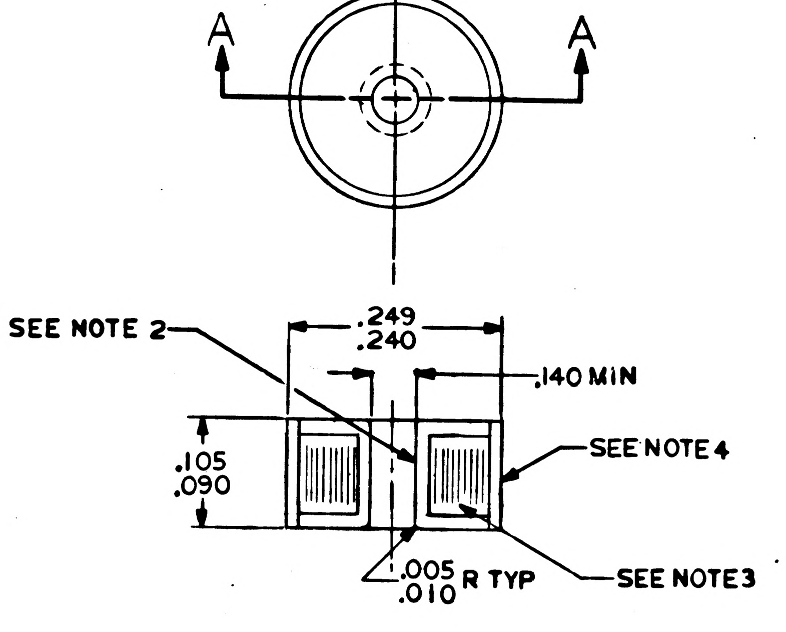
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00130	12-5-62	SEC WJK

NOTES:

1. FOR TEST SPECS SEE NASA DOCUMENT ND 1002008
2. MATERIAL: 303SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. CORES SHALL BE WOUND WITH 1/8 MIL X 1/16 MO-PERM RIBBON
4. JACKET MATERIAL: .011 THK PHENOLIC SLEEVE
5. PAINT THICKNESS TO BE UNIFORM FROM .002-.005 ALL SURFACES
6. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-4-62



SECTION A-A

NOMINAL CORE CHARACTERISTICS

RAMP	T_P µ SEC	T_S µ SEC	V_1 MV	V_O MV
200 MA / µ SEC	2.5	1.9	240	—
400 MA / µ SEC	1.4	1.5	360	—
1000 MA / µ SEC	—	—	—	13

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL //
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FINAL FINISH //

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DWG. NO.
CONTRACT
DRAWN W. T. Troy DATE 9-19-62
CHECKED Fred Shanley 10-3-62
APPROVAL D Duggan
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 10-4-62
MIT APPROVAL W. Kupfer 10/4

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, 26 MAXWELL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006773
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006773 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00130	12-5-62	WK
B	ADDED PROCUREMENT NOTE 7 PER TDRR 00433	2-20-63	WJB WK

NOTES:

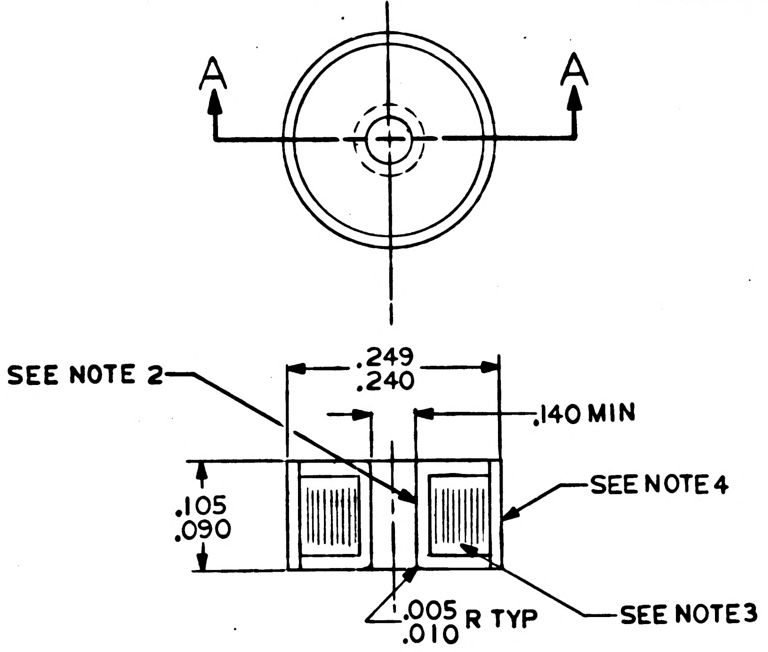
1. FOR TEST SPECS SEE NASA DOCUMENT ND 1002008
2. MATERIAL: 303 SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. CORES SHALL BE WOUND WITH 1/8 MIL X 1/16 MO-PERM RIBBON
4. JACKET MATERIAL: .011 THK PHENOLIC SLEEVE
5. PAINT THICKNESS TO BE UNIFORM FROM .002-.005 ALL SURFACES
6. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
7. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.

   B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER B BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.

   C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER B.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-11-62



SECTION A-A

NOMINAL CORE CHARACTERISTICS

RAMP	T_P µSEC	T_S µSEC	V_1 MV	V_0 MV
200 MA / µSEC	2.5	1.9	240	—
400 MA / µSEC	1.4	1.5	360	—
1000 MA / µSEC	—	—	—	13

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND 1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL //
HEAT TREATMENT //
FINAL FINISH //

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DWG. NO. CONTRACT
DRAWN W.T. Troy DATE 9-19-62
CHECKED Lard Shanley 10-3-62
APPROVAL D Duggan
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 10-4-62
MIT APPROVAL W. Kupfer 10/4

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CORE, 26 MAXWELL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006773
SCALE NONE WT SHEET 1 OF 1

1006773

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C 1006773

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00130	12-5-62	SEC WAK
B	ADDED PROCUREMENT NOTE 7 PER TDRR 00433	2-20-63	WAB WK
C	REPLACED WITH CHANGED BY REV D PER TDRR 00513		WK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-11-62

NOTES:

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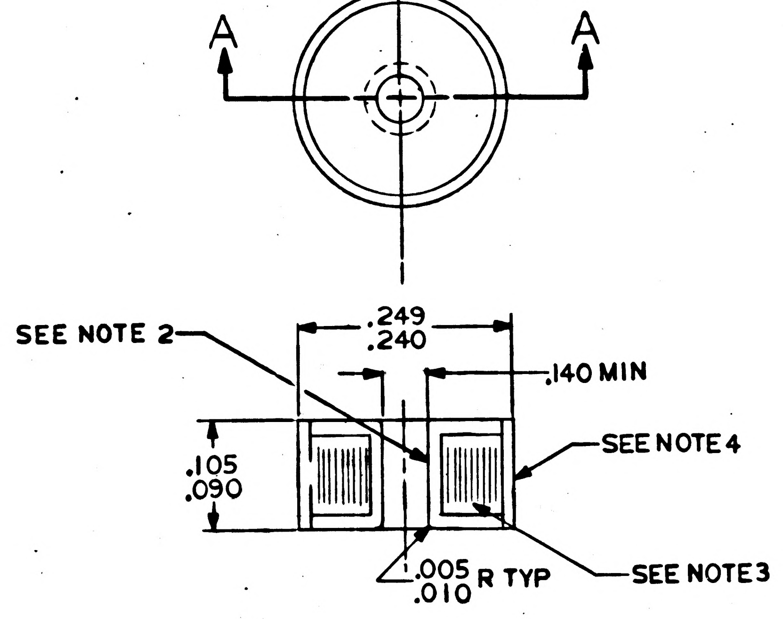
6. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
7. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER B BY ODERING TO VENDOR CATALOG NO & SPECIFICATIONS. REFERENCE ND 1002034.
   C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER B.



SECTION A-A

NOMINAL CORE CHARACTERISTICS

RAMP	T_P μ SEC	T_S μ SEC	V_1 MV	V_O MV
200 MA / μ SEC	2.5	1.9	240	—
400 MA / μ SEC	1.4	1.5	360	—
1000 MA / μ SEC	—	—	—	13

Ⓒ REPLACED WITH CHANGE BY REV D

MASTER

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND 1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —//—
HEAT TREATMENT —//—
FINAL FINISH —//—

MIT
INSTRUMENTATION L
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN W.T. Troy DATE 9-19-62
CHECKED Fred Shanley 10-3-62
APPROVAL D Duggan
APPROVAL Eldon C Hall
NASA APPROVAL W J Rhine 10-4-62
MIT APPROVAL Wh Kupfer 10/4

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HOUSTON, TEXAS

CORE, 26 MAXWELL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006773
SCALE NONE
WT
SHEET 1 OF 1

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1006773 D

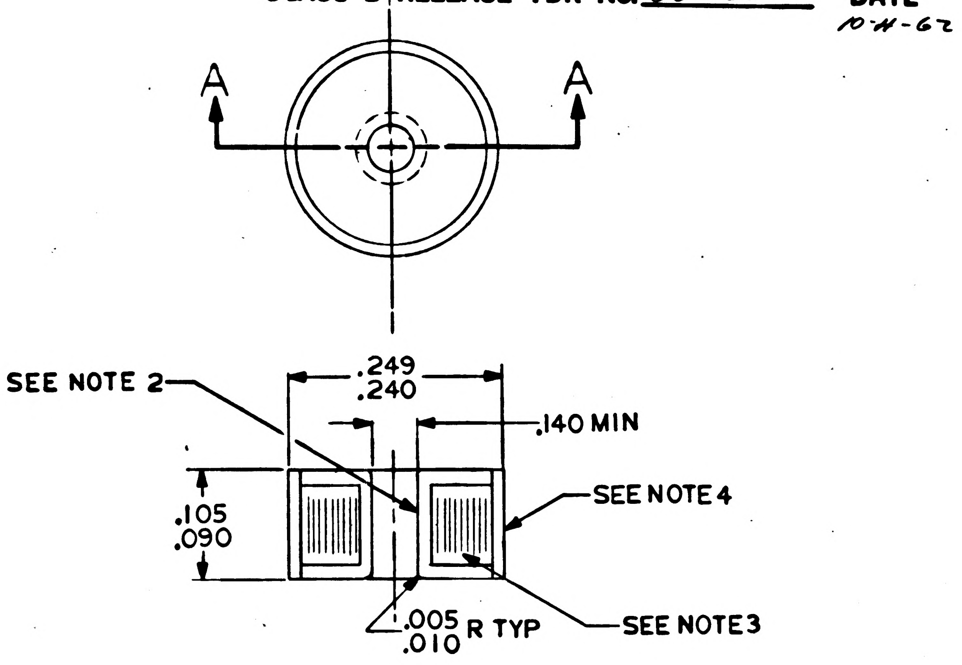
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
D	REPLACES REV C WITH CHANGE PER TDRR 00513		WRL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00050 DATE 10-11-62

NOTES:

1. FOR TEST SPECS SEE NASA DOCUMENT ND 1002008
2. MATERIAL: 303 SST PER QQ-S-7638-1 PART TO BE FREE FROM BURRS
3. CORES SHALL BE WOUND WITH 1/8 MIL X 1/16 MO-PERM RIBBON
4. JACKET MATERIAL: .011 THK PHENOLIC SLEEVE
5. PAINT THICKNESS TO BE UNIFORM FROM .002-.005 ALL SURFACES
6. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



SECTION A-A

NOMINAL CORE CHARACTERISTICS

RAMP	T_P μ SEC	T_S μ SEC	V_1 MV	V_0 MV
200 MA / μ SEC	2.5	1.9	240	—
400 MA / μ SEC	1.4	1.5	360	—
1000 MA / μ SEC	—	—	—	13

Ⓓ REPLACES REV C WITH CHANGE

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND 1002034

MASTER

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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NASA APPROVAL W. J. Rhine 10-4-62
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CORE, 26 MAXWELL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006773
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1006773 E

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
(A) D	REPLACES REV C WITH CHANGE PER TDRR 00513		WK
E	REPLACED BY REV F WITH CHANGES PER TDRR 02008	7/17/63	

NOTES:

1. FOR TEST SPECS SEE NASA DOCUMENT ND 1002008
2. MATERIAL: 303 SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. CORES SHALL BE WOUND WITH 1/8 MIL X 1/16 MO-PERM RIBBON
4. JACKET MATERIAL: .011 THK PHENOLIC SLEEVE
5. PAINT THICKNESS TO BE UNIFORM FROM .002-.005 ALL SURFACES
6. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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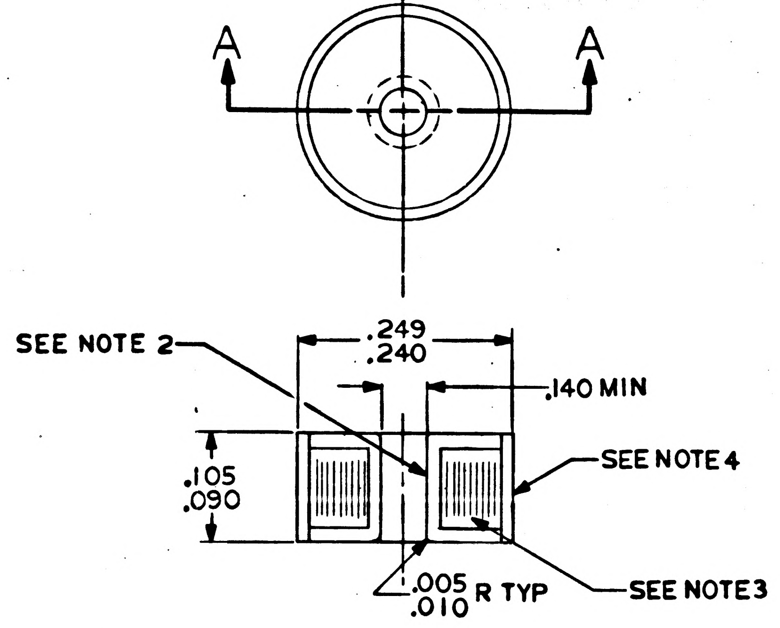

NOMINAL CORE CHARACTERISTICS

RAMP	T_P µ SEC	T_S µ SEC	V_1 MV	V_0 MV
200 MA / µ SEC	2.5	1.9	240	—
400 MA / µ SEC	1.4	1.5	360	—
1000 MA / µ SEC	—	—	—	13

E REPLACED BY REV F WITH CHANGES

Ⓓ REPLACES REV C WITH CHANGE

SECTION A-A

MASTER

FOR SOURCE OF SUPPLY
SEE QUALIFIED VENDOR LIST
ND 1002034

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CORE, 26 MAXWELL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
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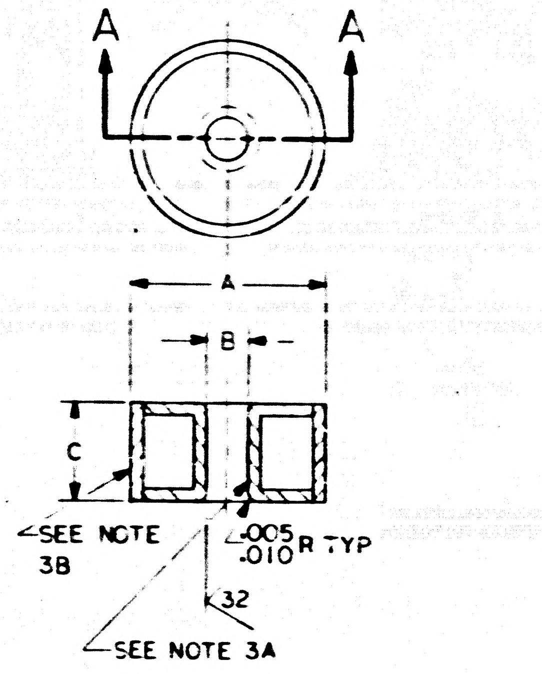
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02008	7/17/63	

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS
     - (1) PAINT THICKNESS TO BE UNIFORM FROM .002 - .005 ALL SURFACES
     - (2) MARKING - PACKING SLIPS AND EXTERNAL OR INTERNAL (CONTAINERS SHALL BE MARKED WITH THE MANUFACTURERS NAME, PART NUMBER, AND NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - B. ELECTRICAL REQUIREMENTS(100%)
     - (1) TESTING SHALL BE PERFORMED IN ACCORDANCE WITH ND 1002008
     - (2) PARAMETERS SHALL BE IN ACCORDANCE WITH TABLE I
3. DESIGN REQUIREMENTS:
   - A. BOBBIN MATERIAL SHALL BE 303 SST PER QQ-S-763B, PART SHALL BE FREE FROM BURRS
   - B. JACKET MATERIAL SHALL BE .011 THICK PHENOLIC SLEEVE



NASA DRAWING NUMBER	DIM A	DIM B	DIM C	CHARACTERISTICS
1006773-1	.249 .240	.140 MIN	.105 .090	TABLE I
1006773-2	.187 .174	.100 MIN	.058 MAX	TABLE II

TABLE I
26 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	Tp u SEC	Ts u SEC	Vi MV	Vo MV
200 MA / u SEC	2.5 ± 5%	1.5 MIN 2.1 MAX	275 MIN 290 MAX	—
400 MA / u SEC	1.4 MIN 1.6 MAX	1.3 MIN 1.5 MAX	325 MIN 400 MAX	—
1000 MA / u SEC	—	—	—	15 MAX

TABLE II
11 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	Tp u SEC	Ts u SEC	Vi MV	Vo MV
200 MA / u SEC	2.2 ± 5%	1.5 MIN 2.1 MAX	100 MIN 130 MAX	—
400 MA / u SEC	1.3 ± 5%	1.0 MIN 1.4 MAX	145 MIN 190 MAX	—
1000 MA / u SEC	—	—	—	9 MAX

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006773
SCALE
WT
SHEET 1 OF 1

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1006773 F

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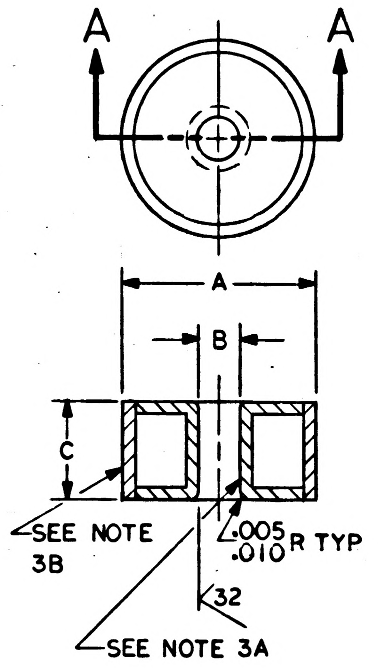
1006773 G

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
F	REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02008	7/17/63	
G	REVISED AND ADDED SHEET 2 & 3 PER TDRR 03006	6 SEP 63	WK

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS
     - (1) PAINT THICKNESS TO BE UNIFORM FROM .002 - .005 ALL SURFACES
     - (2) MARKING - PACKING SLIPS AND EXTERNAL OR INTERNAL (CONTAINERS SHALL BE MARKED WITH THE MANUFACTURERS NAME, PART NUMBER, AND NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - B. ELECTRICAL REQUIREMENTS(100%)
     - (1) TESTING SHALL BE PERFORMED AS OUTLINED ON SHEET 2.
     - (2) PARAMETERS SHALL BE IN ACCORDANCE WITH TABLE I
3. DESIGN REQUIREMENTS:
   - A. BOBBIN MATERIAL SHALL BE 303 SST PER QQ-S-763B, PART SHALL BE FREE FROM BURRS
   - B. JACKET MATERIAL SHALL BE .011 THICK PHENOLIC SLEEVE
   - C. CORES SHALL BE FABRICATED FROM 1/8 MIL MO-PERM RIBBON WOUND ON AUSTENITIC STAINLESS STEEL.



NASA DRAWING NUMBER	DIM A	DIM B	DIM C	CHARACTERISTICS
1006773-1	.249 .240	.140 MIN	.105 .090	TABLE I
1006773-2	.187 .174	.100 MIN	.058 MAX	TABLE II

G	G	G
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

TABLE I
26 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	T_P u SEC	T_S u SEC	V_1 MV	V_O MV
200 MA / u SEC	2.5 ± 5%	1.5 MIN 2.1 MAX	215 MIN 290 MAX	—
400 MA / u SEC	1.4 MIN 1.6 MAX	1.3 MIN 1.5 MAX	325 MIN 430 MAX	—
1000 MA / u SEC	—	—	—	15 MAX

TABLE II
11 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	T_P u SEC	T_S u SEC	V_1 MV	V_O MV
200 MA / u SEC	2.2 ± 5%	1.5 MIN 2.1 MAX	100 MIN 130 MAX	—
400 MA / u SEC	1.3 ± 5%	1.0 MIN 1.4 MAX	145 MIN 190 MAX	—
1000 MA / u SEC	—	—	—	9 MAX

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

F REPLACES REV E WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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APPROVAL Eldon C Hall 12 July 63
NASA APPROVAL 7-17-63
MIT APPROVAL 7/17/63

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CODE IDENT NO. SIZE C NASA DRAWING NO. 1006773
SCALE NONE WT SHEET 1 OF 3

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	THIS SHEET ADDED PER TDRR 03006	5 Aug 63	WK

4. TEST REQUIREMENTS:
   INSPECTION AND/OR TEST

A. TEST EQUIPMENT: CORES ARE TO BE TESTED IN AN EQUIPMENT WHICH PERMITS APPLICATION OF A "SET" PULSE OF SUFFICIENT AMPLITUDE AND DURATION TO SATURATE THE CORE UNDER TEST, FOLLOWED BY A LINEAR (APPROX) RAMP WHOSE SLOPE MAY BE MEASURED.

B. CALIBRATION OF TEST EQUIPMENT: STANDARD CORES FURNISHED BY MIT ARE TO FORM THE BASIS OF THIS SPECIFICATION AND ARE TO BE USED FOR THE PURPOSE OF CALIBRATING THE TEST EQUIPMENT.

C. CALIBRATION PROCEDURE: EQUIPMENT SHALL BE CONNECTED TO A WELL-REGULATED LINE SUPPLY AND ALLOWED TO STABILIZE FOR ONE HOUR BEFORE MEASUREMENTS ARE MADE.

1) CALIBRATE SWEEP OF TEKTRONIX 530-340 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

2) USING TYPE D HIGH-GAIN DIFFERENCE AMPLIFTER PLUG-IN, CALIBRATE VERTICAL AMPLIFIER WITH A CALIBRATOR WHICH PERMITS THE APPLICATION OF A KNOWN (±1%) VOLTAGE TO THE VERTICAL AMPLIFIER. THE INTERNAL CALIBRATOR OF THE OSCILLOSCOPE MAY BE USED PROVIDING ITS ACCURACY HAS BEEN VERIFIED.

3) ADJUST THE AMPLITUDE AND DURATION OF THE SET PULSE SO THAT THEY ARE RESPECTIVELY AT LEAST 1/2 AMPERE AND 10 uSEC.

4) ADJUST THE SLOPE OF THE RAMP SO THAT IT INITIALLY APPROXIMATES 200 ma/uSEC. USING ONE OF THE MIT-FURNISHED STANDARD CORES, ADJUST RAMP SLOPE SO THAT MEASUREMENTS OF TIME TO PEAK, SWITCHING TIME, AND AMPLITUDE CORRESPOND TO THE DATA FURNISHED WITH THE CORES FOR THIS PARTICULAR RAMP SLOPE.

5) MEASURE "1" SWITCHING WAVE FORM.

6) READJUST RAMP SLOPE SO THAT IT APPROXIMATES 400 ma/uSEC. USING THE MIT-STANDARD CORE, ADJUST RAMP SLOPE SO THAT THE MEASUREMENTS OF SWITCHING TIME, TIME TO PEAK, AND AMPLITUDE CORRESPOND TO THE DATA FURNISHED WITH THE CORE FOR THIS PARTICULAR RAMP SLOPE.

7) MEASURE "1" SWITCHING WAVE FORM V_2.

8) READJUST RAMP SLOPE SO THAT IT APPROXIMATES 1000 ma/uSEC. DISCONNECT SET PULSE. USING MIT-STANDARD CORE, ADJUST RAMP SLOPE SO THAT THE MEASUREMENTS OF PEAK "ZERO" OUTPUT VOLTAGE IS OBTAINED. USE INTEGRATING CIRCUIT, SHOWN IN FIGURE 1, WHEN PERFORMING THIS MEASUREMENT.

9) MEASURE "ZERO" OUTPUT V_0 ON CORES, USING INTEGRATION CIRCUIT.

10) REPEAT CALIBRATION PROCEDURE AFTER TESTING EACH 100 CORES OR AFTER 8 OPERATION HOURS, WHICHEVER IS SOONER.

D. DEFINITIONS:

1) TIME TO PEAK SHALL BE MEASURED FROM THE START OF THE RAMP TO THE PEAK OF THE OUTPUT VOLTAGE WAVEFORM. THE START OF THE RAMP MAY BE FOUND BY EXTENDING THE RAMP BACK UNTIL IT CROSSES THE "ZERO CURRENT " AXIS.

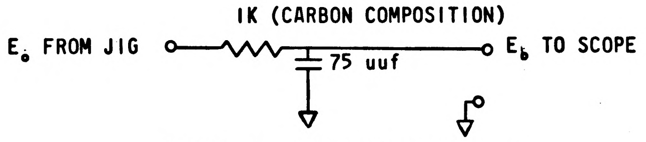

FIGURE 2. INTEGRATING CIRCUIT

THE VOLTAGE INDUCED BY THE TESTING JIG MUST BE TAKEN INTO ACCOUNT WHEN MEASURING V_0. A TYPICAL CASE IS SHOWN IN FIGURE 3. PEAK V_0 IS DEFINED AS THE MAXIMUM OF $V_{\text{"ZERO"}} - V_{\text{JIG}}$.

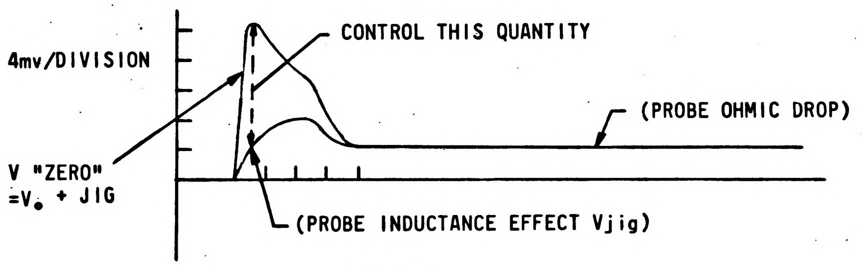

FIGURE 3

TYPICAL OUTPUT VOLTAGES, AFTER INTEGRATION, DUE TO JIG INDUCTANCE AND RESISTANCE; COMBINED JIG AND "ZERO" OUTPUTS: CURRENT SLOPE = 1000 mA/uSEC.

Ⓖ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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1006773 G

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	THIS SHEET ADDED PER TDRR 03006	5 Sep 63	WK

DEFINITIONS: (CONT.)

2) SWITCHING TIME SHALL BE MEASURED FROM 10% OF THE OUTPUT WAVEFORM TO 10% OF SAME WAVEFORM.

3) PEAK AMPLITUDE SHALL BE MEASURED FROM ZERO VOLTS TO THE PEAK OF THE OUTPUT WAVEFORM.

4) FOR MEASUREMENTS OF "ZERO" OUTPUT, THE INTEGRATING CIRCUIT SHOWN BELOW SHALL BE USED.

E. LIMITS - (SEE FIGURE 1)

1) TIME TO PEAK (T_p) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±5% OF THE STANDARD CORE OUTPUT FOR BOTH RAMP SLOPES.

2) SWITCHING TIME (T_s) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±10% OF THE STANDARD CORE FOR BOTH RAMP SLOPES.

3) PEAK "ONE" OUTPUT (V_1) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±10% OF THE STANDARD CORE FOR BOTH RAMP SLOPES.

4) PEAK "ZERO" OUTPUT (V_0) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±20%.

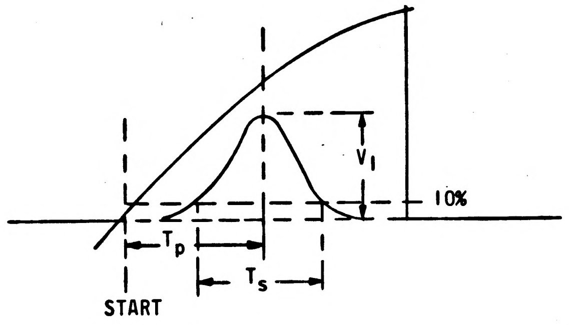

FIGURE 1

Ⓖ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
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SIZE C
NASA DRAWING NO. 1006773
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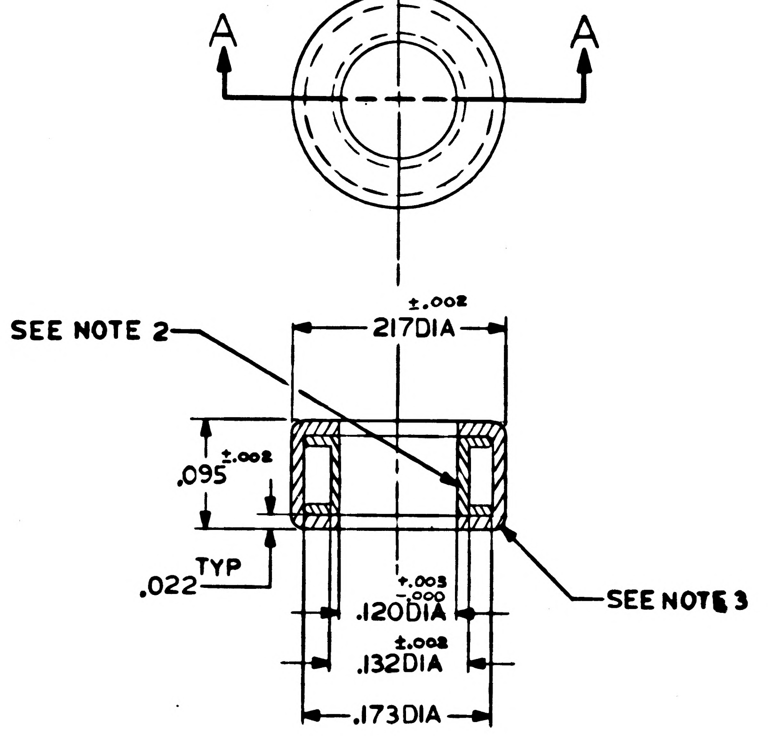
CLASS B RELEASE TDR No. 00050 DATE 10-11-62

NOTES:

1. FOR TEST SPECS SEE NASA DOCUMENT ND 1002008
2. MATERIAL: 303 SST PER QQ-S-763B-1 PART TO BE FREE FROM BURRS
3. MATERIAL: NYLON PER MIL-P-20693 TYPE IV



SECTION A-A

NOMINAL CORE CHARACTERISTICS

RAMP	T_P μSEC	T_S μSEC	V_I MV	V_O MV
200 MA / μSEC	2.5	1.9	240	—
400 MA / μSEC	1.4	1.5	360	—
1000 MA / μSEC	—	—	—	13

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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, 26 MAXWELL

SPECIFCATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006773
SCALE NONE
WT
SHEET 1 OF 1

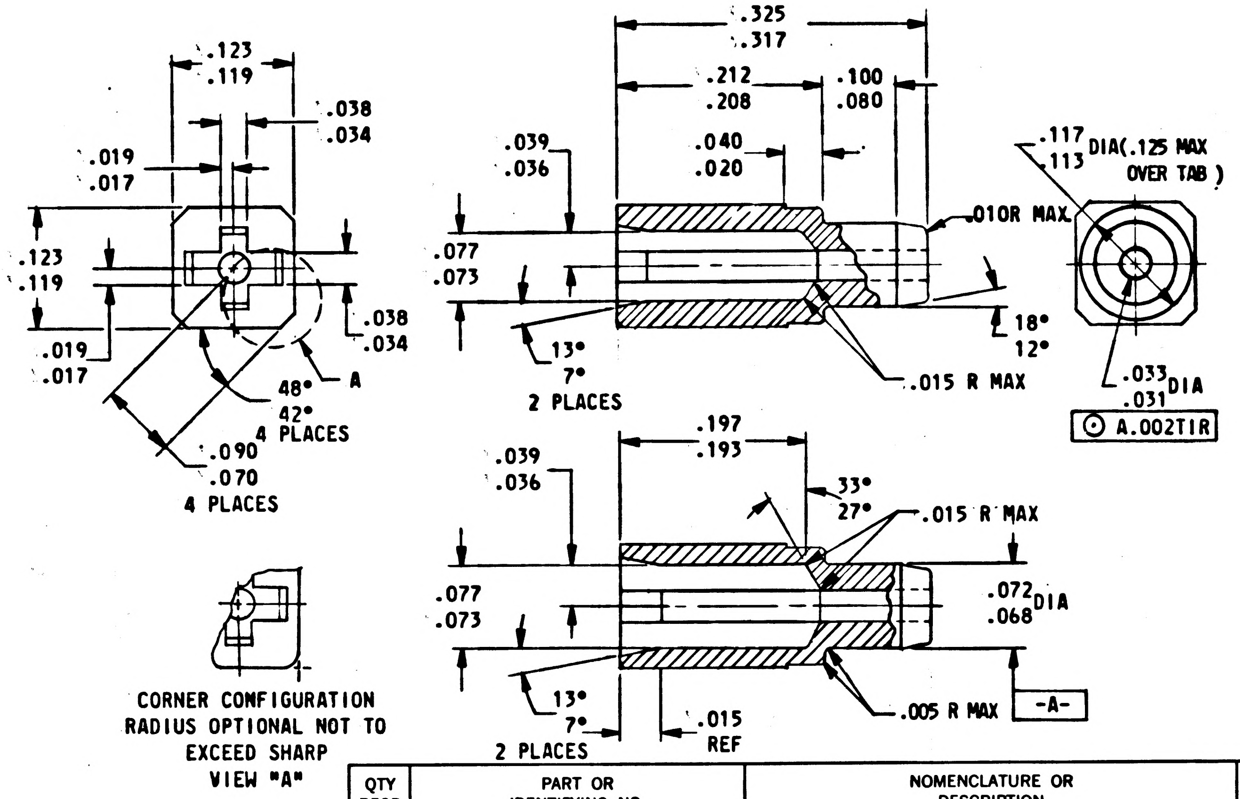
A 1006774

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS TDRR 00189 12·20·62		
—	ORIGINATED	—	—
A	REVISED PER TDRR 01289	5/22/63	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: POLYAMIDE (NYLON) PLASTIC IN ACCORDANCE WITH MIL-P-17091, TYPE I.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.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CORNER CONFIGURATION
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ORIGINAL SOURCE OF SUPPLY

MALCO MANUFACTURING CO.
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC '62
APPROVAL
APPROVAL
NASA APPROVAL W J R 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR, WRAPOST-FEMALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006774
SCALE NONE
WT
SHEET 1 OF 1

1006774 A

INCHES
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PHOTOGRAPHIC SCALE ONLY

B	1006774

REVISIONS TDRR 00189 12·20·62			
SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 01289	5/22/68	
B	REVISED PER TDRR 07623	4/14/67	

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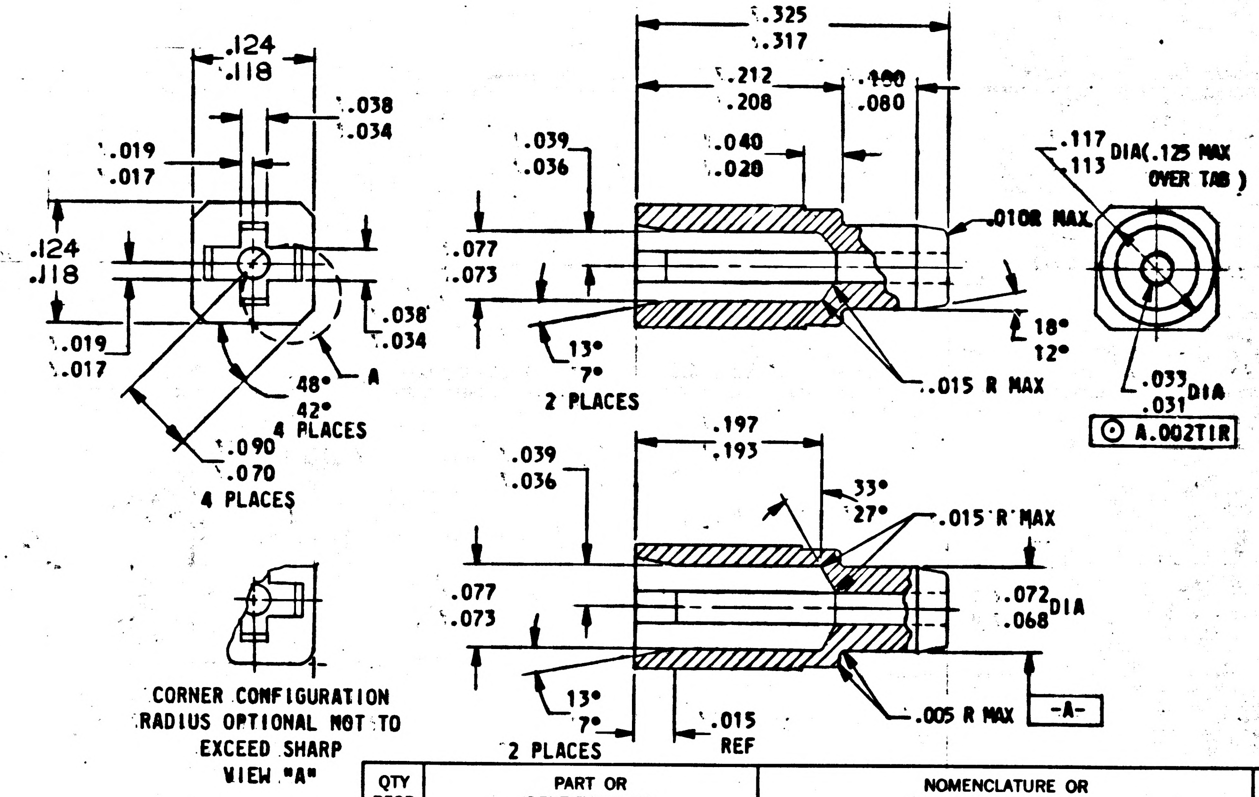
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.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CORNER CONFIGURATION RADIUS OPTIONAL NOT TO EXCEED SHARP
VIEW "A"

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

ORIGINAL SOURCE OF SUPPLY
MALCO MANUFACTURING CO.
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

MASTER

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC '62
APPROVAL
APPROVAL
NASA APPROVAL 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR, WRAPOST-FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006774
SCALE NONE
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SHEET 1 OF 1

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PHOTOGRAPHIC SCALE ONLY

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REVISIONS TDRR 00189 12·20·62			
SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 01289	5/22/68	[illegible]
B	REVISED PER TDRR 07623	4/14/67	[illegible]
C	REVISED PER TDRR 10268	[illegible]	[illegible]

NOTES:

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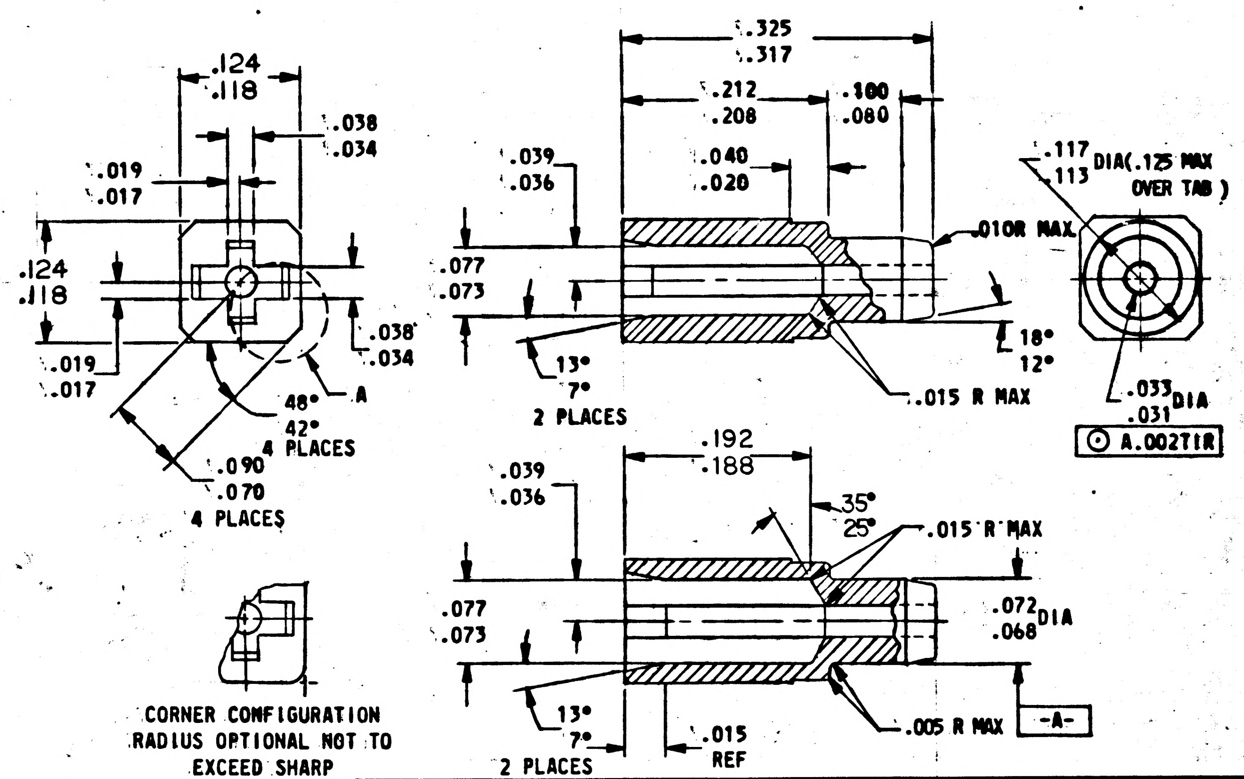
3. PARTS SHALL BE IDENTIFIED PER ND1002019 SHOWING THE NASA DRAWING NO. AND REVISION LETTER. MANUFACTURERS IDENTIFICATION AND PART NO. MAY APPEAR ON PACKAGES.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PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT
		MATERIAL SEE NOTE	DRAWN Ray Wheel DATE 4 Dec 62 CHECKED H. Maynard 14 DEC '62 APPROVAL Joe Mator APPROVAL D. J. Duggan
		HEAT TREATMENT NONE	NASA APPROVAL W J Rhine 12-20-62
NEXT ASSY	USED ON	FINAL FINISH NONE	MIT APPROVAL [illegible]
APPLICATION			

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR, WRAPOST-FEMALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
	C	1006774	
SCALE NONE	WT		SHEET 1 OF 1

MASTER

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PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006774 D

REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 01289	5/22/63	[illegible]
B	REVISED PER TDRR 07623	4/14/67	[illegible]
C	REVISED PER TDRR 10268	[illegible]	WR.
D	REVISED PER TDRR 10886	8 July 69	WR

NOTES:

1. REQUIREMENTS:
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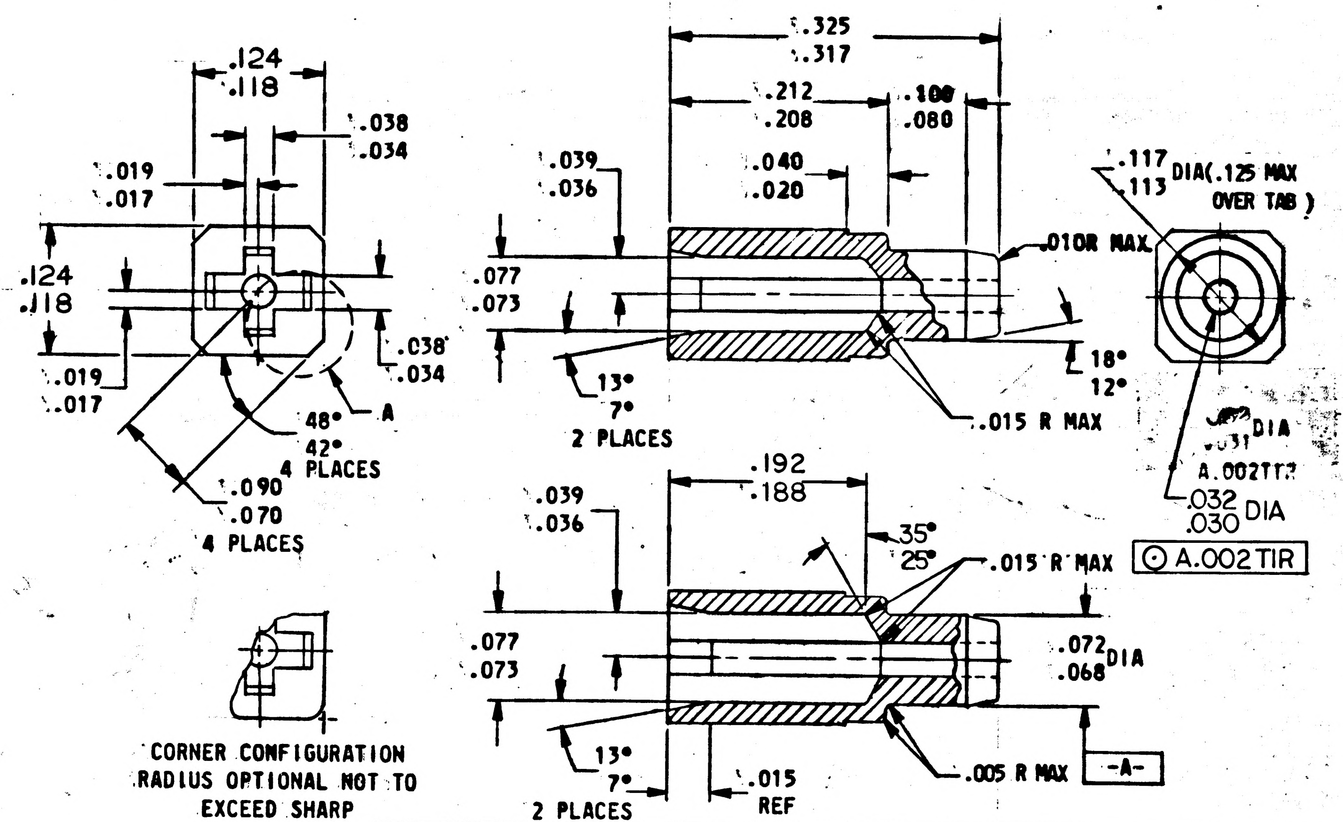

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CORNER CONFIGURATION RADIUS OPTIONAL NOT TO EXCEED SHARP
VIEW "A"

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC '62
APPROVAL Joe Marton
APPROVAL D. Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR, WRAPOST-FEMALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006774
SCALE NONE
WT
SHEET 1 OF 1

INCHES

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REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 01289	5/22/63	[illegible]
B	REVISED PER TDRR 07623	[illegible]	[illegible]
C	REVISED PER TDRR 10268	[illegible]	WR
D	REVISED PER TDRR 10886	[illegible]	WR
E	REVISED PER TDRR 17368	[illegible]	WR

NOTES:

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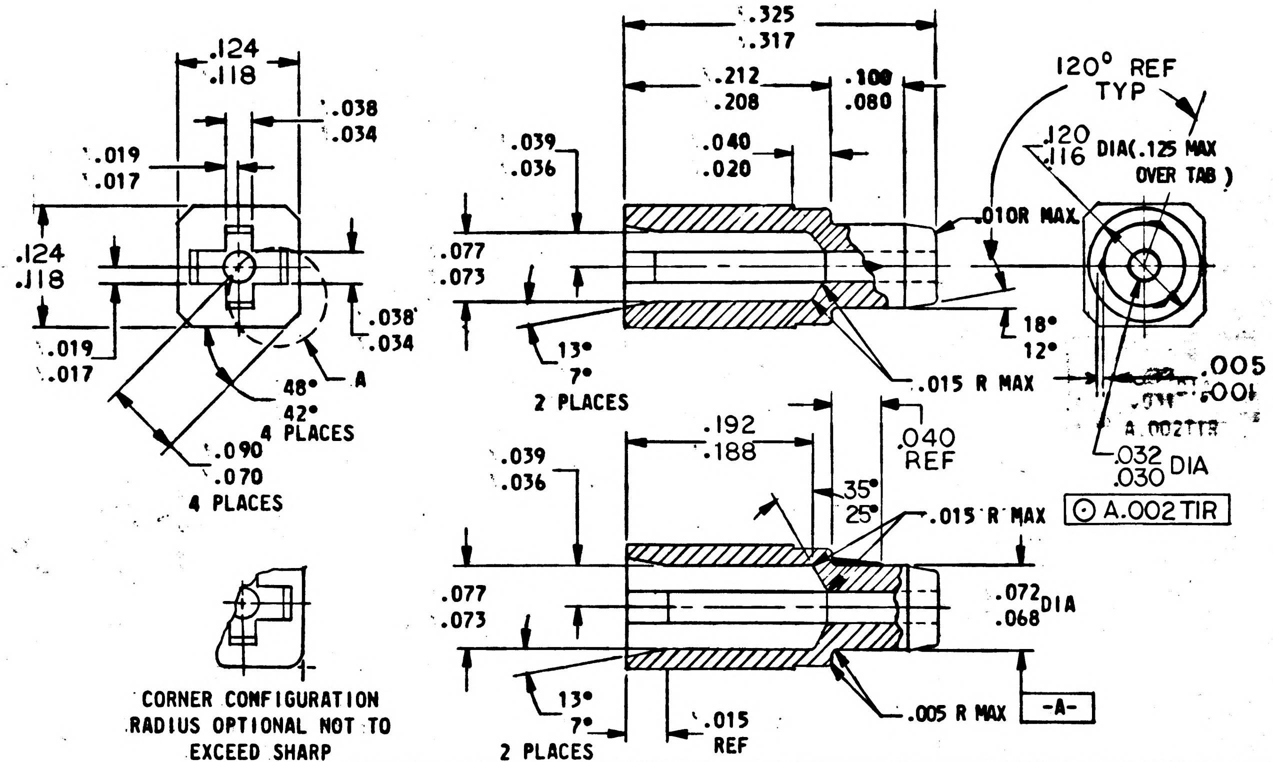
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CORNER CONFIGURATION
RADIUS OPTIONAL NOT TO
EXCEED SHARP
VIEW "A"

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC '62
APPROVAL [illegible]
APPROVAL [illegible]

NASA APPROVAL W J Rhine 12-20-62

MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR, WRAPOST-FEMALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006774
SCALE NONE
WT
SHEET 1 OF 1

MASTER

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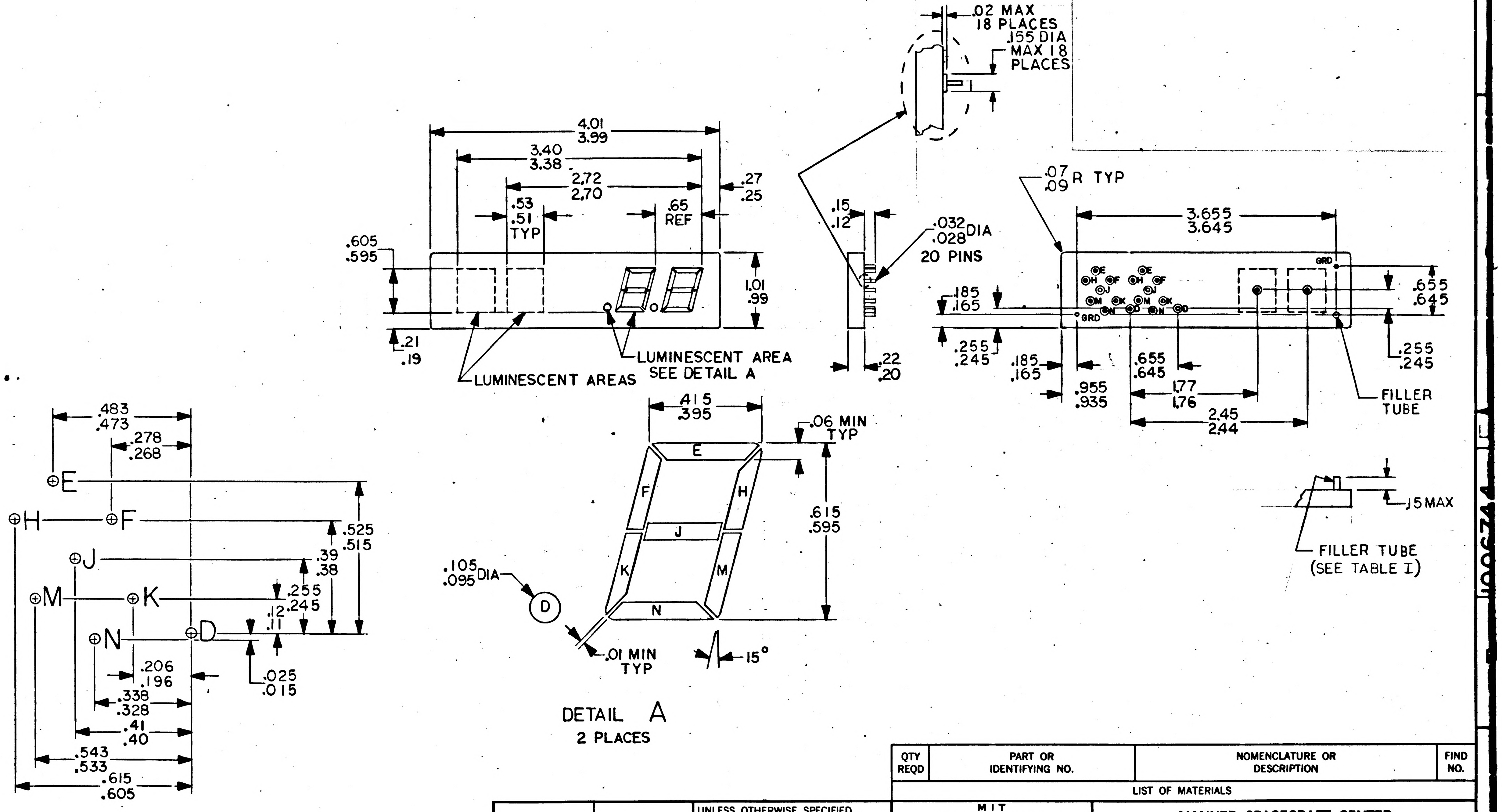
1006744 | E ⓜ

REVISIONS 0 8550 5-19-64

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13441	10/26/64	
B	REVISED AND UPGRADED TO CLASS A PER TDRR 15510	1/26/65	WK
C	REVISED PER TDRR 18023		WK
D	REVISED PER TDRR 19190	6-2-65	WK
E	REVISED PER TDRR 22276	9/14	MGM



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MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
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SEE NOTES
HEAT TREATMENT
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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN S.T. Orifice DMS DATE 3FEB64
CHECKED E. Sargent ASM 13FEB64
APPROVAL
APPROVAL Eldon C Hall 15 May 64
NASA APPROVAL 5/17/64
MIT APPROVAL 5/19/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY, ELECTROLUMINESCENT (PROGRAM)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006744
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006774

REVISIONS TORR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—

NOTES:

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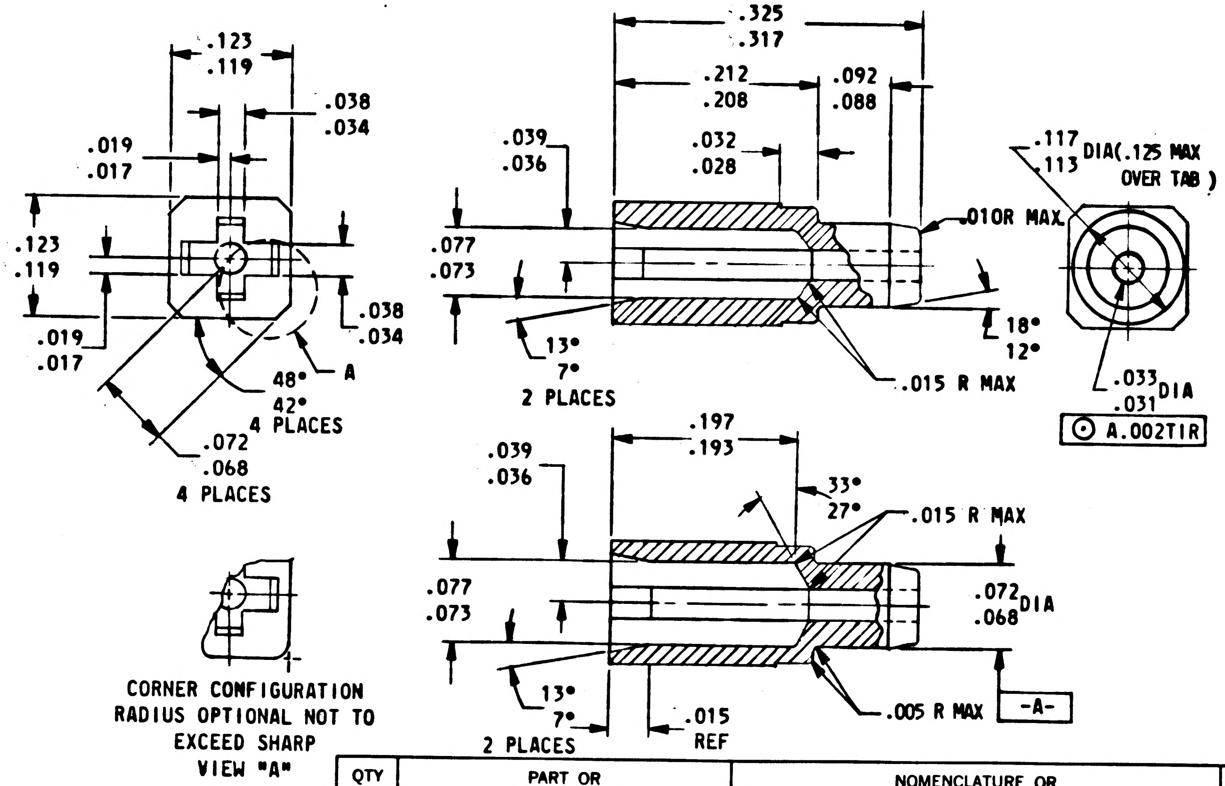
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.032
.028
.117
.113 DIA(.125 MAX OVER TAB)
.010R MAX
.077
.073
18°
12°
13°
7°
2 PLACES
.015 R MAX
.033
.031 DIA
⊙ A.002TIR
.197
.193
.039
.036
33°
27°
.015 R MAX
.077
.073
.072
.068 DIA
13°
7°
2 PLACES
.015
REF
.005 R MAX
-A-

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

ORIGINAL SOURCE OF SUPPLY

MALCO MANUFACTURING CO.
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC '62
APPROVAL Joe Morton
APPROVAL

NASA APPROVAL W J Rhine 12-20-62

MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR, WRAPOST-FEMALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006774

SCALE NONE | WT | SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

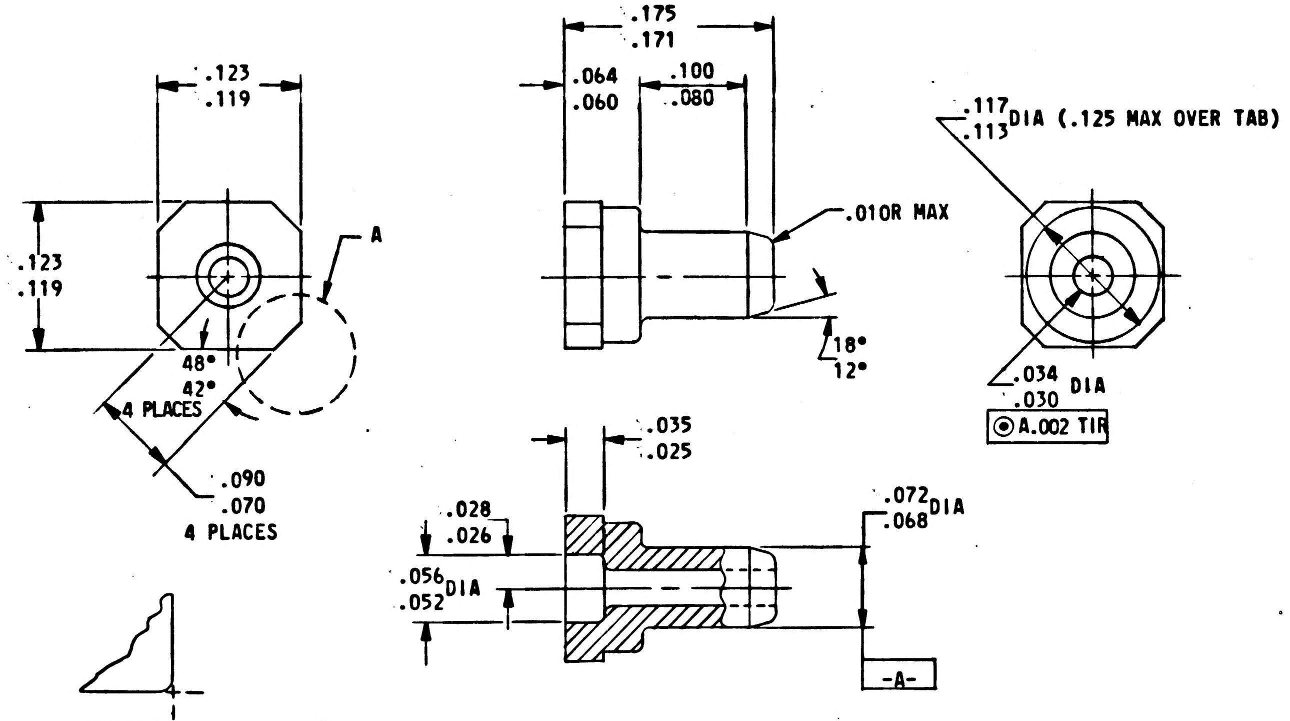
1006775 A

REVISIONS TDRR 00149 12.20.

SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 01288	5/24/63	

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: POLYAMIDE (NYLON) PLASTIC PER MIL-P-17091, TYPE I.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



VIEW A
CORNER CONFIGURATION
RADIUS OPTIONAL. NOT
TO EXCEED SHARP

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 5 Dec 62
CHECKED W. Maynard 14 DEC '62
APPROVAL Joe Marton
APPROVAL E. J. Duggan
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL W. Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR, WRAPOST-MALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006775
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

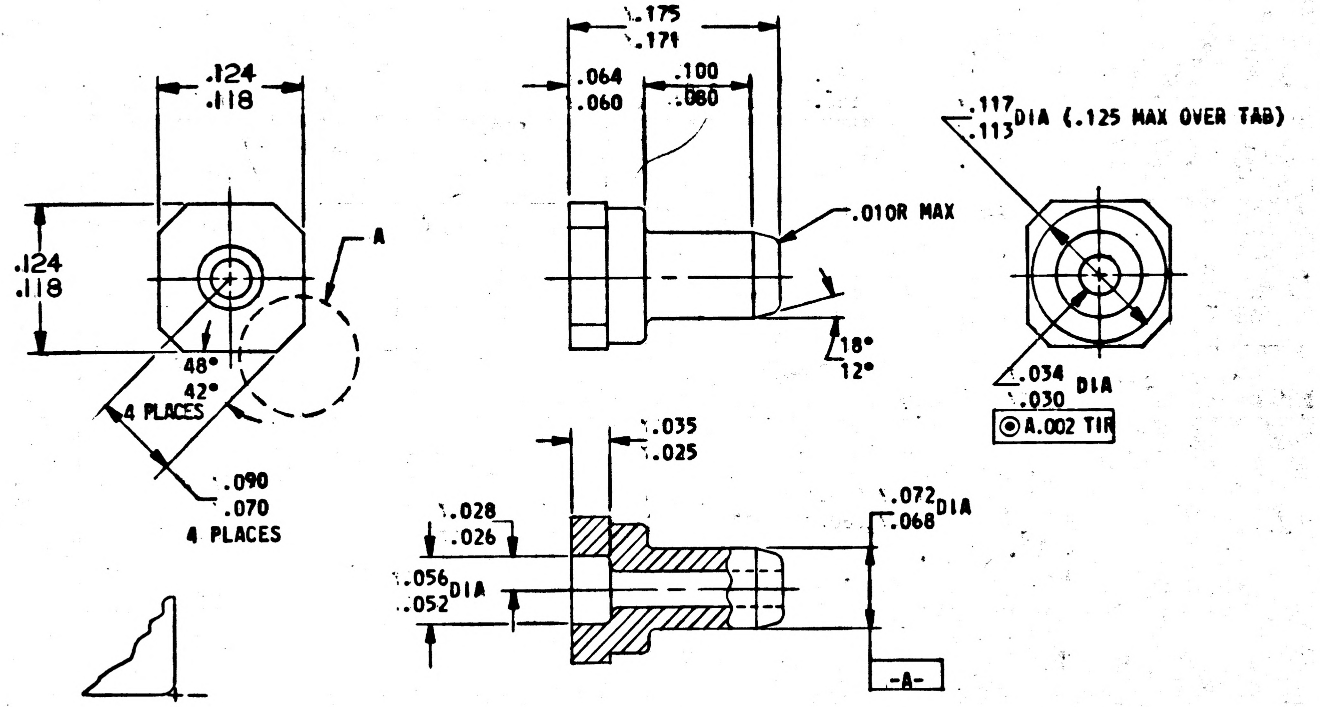
1006775 B

REVISIONS TDRR 00149 12.28.

SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 01288	5/24/63	
B	REVISED PER TDRR 07622	4/14/64	

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: POLYAMIDE (NYLON) PLASTIC PER MIL-P-17091, TYPE I.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



VIEW A
CORNER CONFIGURATION
RADIUS OPTIONAL. NOT
TO EXCEED SHARP

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 5 Dec 62
CHECKED 14 DEC '62
APPROVAL
APPROVAL

NASA APPROVAL 12-20-62

MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006775
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

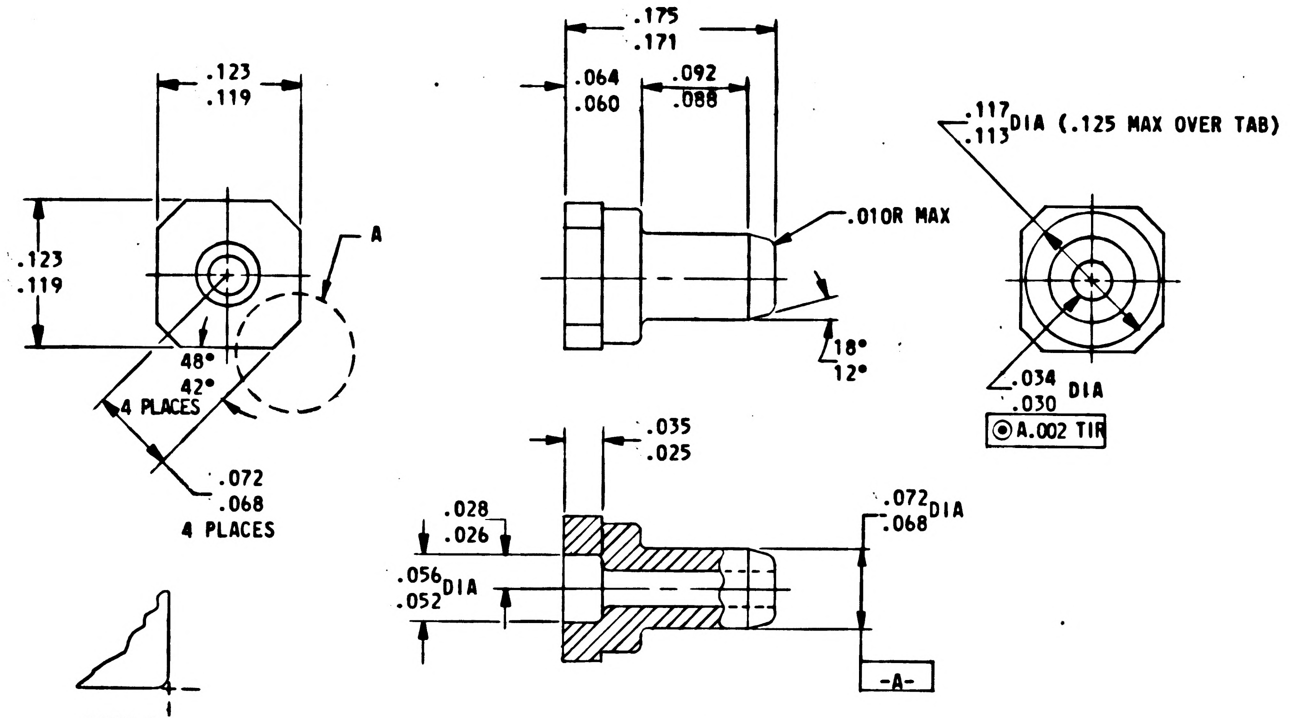
1006775

REVISIONS TORE 00149 12.20.

SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: POLYAMIDE (NYLON) PLASTIC PER MIL-P-17091, TYPE I.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



VIEW A
CORNER CONFIGURATION
RADIUS OPTIONAL. NOT
TO EXCEED SHARP

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES

HEAT TREATMENT: NONE

FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 5 Dec. 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL
NASA APPROVAL 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATOR,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006775
SCALE NONE	WT	SHEET 1 OF 1

1006775

1006776

SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENTS NOTE 6 PER TDRR 00433	2-20-63	WB WR

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129, EXCEPT AS HEREIN SPECIFIED.
   - A. AMBIENT TEMPERATURE RANGE: -90°C TO +204°C.
   - B. MATERIAL: POLYTETRAFLUOROETHYLENE RESIN PER MIL-T-14077, NON RIGID.
     COLOR: NATURAL (WHITE).
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. IDENTIFY PER MIL-STD-130
4. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
5. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 SECTION 3.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

DASH NO	AWG SIZE	LB/FT CALC	DIMENSIONS I.D.	DIMENSIONS WALL THICKNESS
1	1	.021	.311-.289	.016 .024
2	2	.019	.278-.258	
3	3	.017	.249-.229	
4	4	.015	.224-.204	
5	5	.014	.198-.182	
6	6	.012	.178-.162	
7	7	.011	.158-.144	
8	8	.010	.141-.129	
9	9	.007	.124-.114	
10	10	.003	.112-.102	.013 .019
11	11	.003	.101-.091	
12	12	.003	.089-.081	
13	13	.002	.080-.072	
14	14	.002	.072-.064	
15	15	.002	.067-.057	
16	16	.002	.061-.051	
17	17	.002	.054-.045	
18	18	.002	.049-.040	
19	19	.002	.044-.036	
20	20	.002	.039-.032	
21	22	.002	.029-.025	.010 -.014
22	24	.002	.027-.020	
23	26	.001	.020-.016	.007 -.011
24	28	.001	.017-.013	
25	30	.001	.014-.010	

MASTER

6. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC & PHYSICAL DIMENSIONS.
   B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

PPOCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL **SEE NOTE**
HEAT TREATMENT **NA**
FINAL FINISH **NA**

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN M. Callahan DATE 10-30-62
CHECKED D. M. Sleeper 30 OCT 62
APPROVAL
APPROVAL
NASA APPROVAL 11/21/62
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006776
SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 | B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 6 PER TDRR 00433	2-20-63	WR
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WR

NOTES:

1. GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129, EXCEPT AS HEREIN SPECIFIED.
   - A. AMBIENT TEMPERATURE RANGE: -90°C TO +204°C.
   - B. MATERIAL: POLYTETRAFLUOROETHYLENE RESIN PER MIL-T-14077, NON RIGID.
     COLOR: NATURAL (WHITE).
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. IDENTIFY PER MIL-STD-130
4. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
5. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 SECTION 3.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

DASH NO	AWG SIZE	LB/FT CALC	DIMENSIONS	
			I.D.	WALL THICKNESS
1	1	.021	.311-.289	.016 .024
2	2	.019	.278-.258	
3	3	.017	.249-.229	
4	4	.015	.224-.204	
5	5	.014	.198-.182	
6	6	.012	.178-.162	
7	7	.011	.158-.144	
8	8	.010	.141-.129	
9	9	.007	.124-.114	
10	10	.003	.112-.102	.013 .019
11	11	.003	.101-.091	
12	12	.003	.089-.081	
13	13	.002	.080-.072	
14	14	.002	.072-.064	
15	15	.002	.067-.057	
16	16	.002	.061-.051	
17	17	.002	.054-.045	
18	18	.002	.049-.040	
19	19	.002	.044-.036	
20	20	.002	.039-.032	
21	22	.002	.029-.025	.010 -.014
22	24	.002	.027-.020	
23	26	.001	.020-.016	.007 -.011
24	28	.001	.017-.013	
25	30	.001	.014-.010	

Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

6. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC & PHYSICAL DIMENSIONS.

   B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ORDERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.

   C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

PPOCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL **SEE NOTE**
HEAT TREATMENT **NA**
FINAL FINISH **NA**

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN M. Callahan DATE 10-30-62
CHECKED D.M. Sluper 30 OCT 62
APPROVAL
APPROVAL
NASA APPROVAL 11-21-62
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006776
SCALE	WT	SHEET 1 OF 1

1006776 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK

NOTES:

1. GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129, EXCEPT AS HEREIN SPECIFIED.
   A. AMBIENT TEMPERATURE RANGE: -90°C TO +204°C.
   B. MATERIAL: POLYTETRAFLUOROETHYLENE RESIN PER MIL-T-14077, NON RIGID.
      COLOR: NATURAL (WHITE).
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. IDENTIFY PER MIL-STD-130
4. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
5. SUPBLIER SHALL CONFORM TO THE QUALITY ASSURANCE PR VISIONS OF ND 1015404 SECTION 3.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

DASH NO	AWG SIZE	LB/FT CALC	DIMENSIONS	
			I.D.	WALL THICKNESS
1	1	.021	.311-.289	.016 .024
2	2	.019	.278-.258	
3	3	.017	.249-.229	
4	4	.015	.224-.204	
5	5	.014	.198-.182	
6	6	.012	.178-.162	
7	7	.011	.158-.144	
8	8	.010	.141-.129	
9	9	.007	.124-.114	
10	10	.003	.112-.102	.013 .019
11	11	.003	.101-.091	
12	12	.003	.089-.081	
13	13	.002	.080-.072	
14	14	.002	.072-.064	
15	15	.002	.067-.057	
16	16	.002	.061-.051	
17	17	.002	.054-.045	
18	18	.002	.049-.040	
19	19	.002	.044-.036	
20	20	.002	.039-.032	
21	22	.002	.029-.025	.010 -.014
22	24	.002	.027-.020	
23	26	.001	.020-.016	.007 -.011
24	28	.001	.017-.013	
25	30	.001	.014-.010	

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PPOCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE
HEAT TREATMENT NA
FINAL FINISH NA

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN M. Callahan DATE 10-30-62
CHECKED D.M. Sleeper 30 OCT 62
APPROVAL
APPROVAL
NASA APPROVAL 11/21/62
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006776
SCALE
WT
SHEET 1 OF 1

1006776 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 D

M

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO CLASS A RELEASE / TDRR 00665	3/27/63	WK.

NOTES:

1. GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129, EXCEPT AS HEREIN SPECIFIED.
   - A. AMBIENT TEMPERATURE RANGE: -90°C TO +204°C.
   - B. MATERIAL: POLYTETRAFLUOROETHYLENE RESIN PER MIL-T-14077, NON RIGID.
     COLOR: NATURAL (WHITE).
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. IDENTIFY PER MIL-STD-130
4. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
5. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 SECTION 3.

DASH NO	AWG SIZE	LB/FT CALC	DIMENSIONS	
			I.D.	WALL THICKNESS
1	1	.021	.311-.289	.016 .024
2	2	.019	.278-.258	
3	3	.017	.249-.229	
4	4	.015	.224-.204	
5	5	.014	.198-.182	
6	6	.012	.178-.162	
7	7	.011	.158-.144	
8	8	.010	.141-.129	
9	9	.007	.124-.114	
10	10	.003	.112-.102	.013 .019
11	11	.003	.101-.091	
12	12	.003	.089-.081	
13	13	.002	.080-.072	
14	14	.002	.072-.064	
15	15	.002	.067-.057	
16	16	.002	.061-.051	
17	17	.002	.054-.045	
18	18	.002	.049-.040	
19	19	.002	.044-.036	
20	20	.002	.039-.032	
21	22	.002	.029-.025	.010 -.014
22	24	.002	.027-.020	
23	26	.001	.020-.016	.007 -.011
24	28	.001	.017-.013	
25	30	.001	.014-.010	

Ⓒ REPLACES REV B WITH CHANGE

PPOCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL **SEE NOTE**
HEAT TREATMENT **NA**
FINAL FINISH **NA**

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN M. Callahan DATE 10-30-62
CHECKED D. M. Slater 30 OCT 62
APPROVAL 3/27/63
APPROVAL
NASA APPROVAL 11/21/62
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006776
SCALE
WT
SHEET 1 OF 1

1006776 D

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 E

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO CLASS A RELEASE / TDRR 00665	3/27/63	WK.
E	REVISED PER TDRR 01301	5/22/63	

NOTES:

1. GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129, EXCEPT AS HEREIN SPECIFIED.
   A. AMBIENT TEMPERATURE RANGE: -90°C TO +204°C.
   B. MATERIAL: POLYTETRAFLUOROETHYLENE RESIN PER MIL-T-14077, NON RIGID, CLASS 1.
      COLOR: NATURAL (WHITE).
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. IDENTIFY PER MIL-STD-130
4. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
5. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 SECTION 3.

DASH NO	AWG SIZE	LB/FT CALC	DIMENSIONS	
			I.D.	WALL THICKNESS
1	1	.021	.311-.289	.016 .024
2	2	.019	.278-.258	
3	3	.017	.249-.229	
4	4	.015	.224-.204	
5	5	.014	.198-.182	
6	6	.012	.178-.162	
7	7	.011	.158-.144	
8	8	.010	.141-.129	
9	9	.007	.124-.114	
10	10	.003	.112-.102	.013 .019
11	11	.003	.101-.091	
12	12	.003	.089-.081	
13	13	.002	.080-.072	
14	14	.002	.072-.064	
15	15	.002	.067-.057	
16	16	.002	.061-.051	
17	17	.002	.054-.045	
18	18	.002	.049-.040	
19	19	.002	.044-.036	
20	20	.002	.039-.032	
21	22	.002	.029-.025	.010 -.014
22	24	.002	.027-.020	
23	26	.001	.020-.016	.007 -.011
24	28	.001	.017-.013	
25	30	.001	.014-.010	

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PPOCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL **SEE NOTE**

HEAT TREATMENT **NA**

FINAL FINISH **NA**

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN M. Callahan DATE 10-30-62
CHECKED 30 OCT 62
APPROVAL 3/27/63
APPROVAL
NASA APPROVAL 11/21/62
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006776

SCALE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 F

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REVISED & UPGRADED TO CLASS A RELEASE / TDRR 00665	3/27/63	WK.
E	REVISED PER TDRR 01301	5/22/63	
F	REPLACED BY REV G WITH CHANGES PER TDRR 08859	5/24/64	

NOTES:

1. GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129, EXCEPT AS HEREIN SPECIFIED.
   A. AMBIENT TEMPERATURE RANGE: -90°C TO +204°C.
   B. MATERIAL: POLYTETRAFLUOROETHYLENE RESIN PER MIL-T-14077, NON RIGID, CLASS 1.
      COLOR: NATURAL (WHITE).
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. IDENTIFY PER MIL-STD-130
4. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
5. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 SECTION 3.

DASH NO	AWG SIZE	LB/FT CALC	DIMENSIONS	
			I.D.	WALL THICKNESS
1	1	.021	.311-.289	.016 .024
2	2	.019	.278-.258	
3	3	.017	.249-.229	
4	4	.015	.224-.204	
5	5	.014	.198-.182	
6	6	.012	.178-.162	
7	7	.011	.158-.144	
8	8	.010	.141-.129	
9	9	.007	.124-.114	
10	10	.003	.112-.102	.013 .019
11	11	.003	.101-.091	
12	12	.003	.089-.081	
13	13	.002	.080-.072	
14	14	.002	.072-.064	
15	15	.002	.067-.057	
16	16	.002	.061-.051	
17	17	.002	.054-.045	
18	18	.002	.049-.040	
19	19	.002	.044-.036	
20	20	.002	.039-.032	
21	22	.002	.029-.025	.010 -.014
22	24	.002	.027-.020	
23	26	.001	.020-.016	.007 -.011
24	28	.001	.017-.013	
25	30	.001	.014-.010	

Ⓕ REPLACED BY REV Ⓖ WITH CHANGE

Ⓒ REPLACES REV B WITH CHANGE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: **SEE NOTE**

HEAT TREATMENT: **NA**

FINAL FINISH: **NA**

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN M. Callahan DATE 10-30-62
CHECKED 30 OCT 62
APPROVAL 3/27/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006776
SCALE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 G

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGE PER TDRR 08859	5/26/64	

REQUIREMENTS:

1. GENERAL
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404 CLASS 3.
   - C. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
2. ACCEPTANCE AND INSPECTION:
   - A. MATERIAL SHALL BE POLYTETRAFLUOROETHYLENE RESIN PER MIL-M-14077, NON RIGID, CLASS I.
     - (1) COLORS SHALL BE IN ACCORDANCE WITH MIL-STD-104 AND AS INDICATED BY DASH NUMBER.
     - (2) DIMENSIONS PER CHART.
3. DESIGN REQUIREMENTS:
   - A. MATERIAL SHALL MEET GENERAL REQUIREMENTS OF MIL-I-22129.
   - B. SPECIFIC GRAVITY: @60°F: 2.2 NOMINAL
   - C. TENSILE STRENGTH: 3000 P.S.I. (METHOD PER FED. STD. ZZ-R-601)
     - (1) MINIMUM RETENTION OF INITIAL VALUE AFTER AGING 96 HOURS AT 250°C -95%
   - D. OPERATING TEMPERATURE RANGE: -65°C TO +260°C.
   - E. BREAKDOWN VOLTAGE: (MINIMUM VALUE REQUIRED VOLTS @60 CYCLES RMS)

WALL THICKNESS	
.009	11,500
.012	14,600
.016	16,300
.020	17,000

   - F. SHALL NOT SUPPORT COMBUSTION UNDER ANY STANDARD TEST METHOD.
   - G. WATER ABSORPTION: NONE MEASURABLE BY CONVENTIONAL METHODS.
   - H. SOLVENT RESISTANCE:
     - A. COMPLETELY INERT TO ATTACK BY ALL AROMATIC AND HALO GENATED SOLVENTS, AND ALL OTHER KNOWN REAGENTS EXCEPT MOLTEN ALKALI METALS, CHLORINE TRIFLOURIDE, AND FLOURINE GAS AT ELEVATED TEMPERATURE AND PRESSURE.

Ⓖ REPLACES REV (F) WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES
LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE

HEAT TREATMENT N/A

FINAL FINISH N/A

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 5/22/64
CHECKED 5-22-64
APPROVAL G. MAYO 5/26/64
APPROVAL 5/22/64

NASA APPROVAL 5/26/64

MIT APPROVAL 5/26/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006776
SCALE NONE	WT	SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006776 G

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	THIS SHEET ADDED PER TDRR 08859	5/26/64	

AWG SIZE	LB/FT CALC	DIMENSIONS		DASH NO. COLOR-WHITE	DASH NO. COLOR-BLACK	DASH NO. COLOR-BROWN	DASH NO. COLOR-RED	DASH NO. COLOR-ORANGE	DASH NO. COLOR-YELLOW	DASH NO. COLOR-GREEN	DASH NO. COLOR-BLUE	DASH NO. COLOR-VIOLET	DASH NO. COLOR-GREY
		I.D.	WALL THICKNESS										
1	.021	.311-.289		1	26	51	76	101	126	151	176	201	226
2	.019	.278-.258		2	27	52	77	102	127	152	177	202	227
3	.017	.249-.229		3	28	53	78	103	128	153	178	203	228
4	.015	.224-.204		4	29	54	79	104	129	154	179	204	229
5	.014	.198-.182	.016	5	30	55	80	105	130	155	180	205	230
6	.012	.178-.162	.024	6	31	56	81	106	131	156	181	206	231
7	.011	.158-.144		7	32	57	82	107	132	157	182	207	232
8	.010	.141-.129		8	33	58	83	108	133	158	183	208	233
9	.007	.124-.114		9	34	59	84	109	134	159	184	209	234
10	.003	.112-.102		10	35	60	85	110	135	160	185	210	235
11	.003	.101-.091		11	36	61	86	111	136	161	186	211	236
12	.003	.089-.081		12	37	62	87	112	137	162	187	212	237
13	.002	.080-.072		13	38	63	88	113	138	163	188	213	238
14	.002	.072-.064	.013	14	39	64	89	114	139	164	189	214	239
15	.002	.067-.057	.019	15	40	65	90	115	140	165	190	215	240
16	.002	.061-.051		16	41	66	91	116	141	166	191	216	241
17	.002	.054-.045		17	42	67	92	117	142	167	192	217	242
18	.002	.049-.040		18	43	68	93	118	143	168	193	218	243
19	.002	.044-.036		19	44	69	94	119	144	169	194	219	244
20	.002	.039-.032		20	45	70	95	120	145	170	195	220	245
22	.002	.029-.025	.010	21	46	71	96	121	146	171	196	221	246
24	.002	.027-.020	.014	22	47	72	97	122	147	172	197	222	247
26	.001	.020-.016	.007	23	48	73	98	123	148	173	198	223	248
28	.001	.017-.013	.011	24	49	74	99	124	149	174	199	224	249
30	.001	.014-.010		25	50	75	100	125	150	175	200	225	250

Ⓖ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT N/A
FINAL FINISH N/A

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Papia DATE 8 May 64
CHECKED A. Marto 5-22-64
APPROVAL G. MAYO 5/22/64
APPROVAL 5/22/64
NASA APPROVAL 5/26/64
MIT APPROVAL 5/26/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING
ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006776
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

H	1006776

Ⓜ

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGE PER TDRR 08859	5/26/64	DW
H	REVISED PER TDRR 10887	9/Jul/64	WK

REQUIREMENTS:

1. GENERAL

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404 CLASS 3.

   C. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.

2. ACCEPTANCE AND INSPECTION:

   A. MATERIAL SHALL BE POLYTETRAFLUOROETHYLENE RESIN PER MIL-M-14077, NON RIGID, CLASS I.

      (1) COLORS SHALL BE IN ACCORDANCE WITH MIL-STD-104 AND AS INDICATED BY DASH NUMBER.

      (2) DIMENSIONS PER CHART.

3. DESIGN REQUIREMENTS:

   A. MATERIAL SHALL MEET GENERAL REQUIREMENTS OF MIL-I-22129.

   B. SPECIFIC GRAVITY: @60°F: 2.2 NOMINAL

   C. TENSILE STRENGTH: 3000 P.S.I. (METHOD PER FED. STD. ZZ-R-601)

      (1) MINIMUM RETENTION OF INITIAL VALUE AFTER AGING 96 HOURS AT 250°C -95%

   D. OPERATING TEMPERATURE RANGE: -65°C TO +260°C.

   E. BREAKDOWN VOLTAGE: (MINIMUM VALUE REQUIRED VOLTS @60 CYCLES RMS)

WALL THICKNESS	
.009	11,500
.012	14,600
.016	16,300
.020	17,000

   F. SHALL NOT SUPPORT COMBUSTION UNDER ANY STANDARD TEST METHOD.

   G. WATER ABSORPTION: NONE MEASURABLE BY CONVENTIONAL METHODS.

   H. SOLVENT RESISTANCE:

      A. COMPLETELY INERT TO ATTACK BY ALL AROMATIC AND HALO GENATED SOLVENTS, AND ALL OTHER KNOWN REAGENTS EXCEPT MOLTEN ALKALI METALS, CHLORINE TRIFLOURIDE, AND FLOURINE GAS AT ELEVATED TEMPERATURE AND PRESSURE.

Ⓖ REPLACES REV (F) WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES
LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE
HEAT TREATMENT: N/A
FINAL FINISH: N/A

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN CJ Papia DATE 18 May 64
CHECKED A. Marts 5-22-64
APPROVAL G. MAYO 5/26/64
APPROVAL D. Duggan 5/22/64
NASA APPROVAL W Michael 5/26/64
MIT APPROVAL [illegible] 5/26/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING
ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006776
SCALE NONE
WT
SHEET 1 OF 2

INCHES

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

H 1006776

Ⓜ

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
G	THIS SHEET ADDED PER TDRR 08859	5/26/64	
H	REVISED PER TDRR 10887		

AWG SIZE	LB/FT CALC	DIMENSIONS I.D.	DIMENSIONS WALL THICKNESS	DASH NO. COLOR-WHITE	DASH NO. COLOR-BLACK	DASH NO. COLOR-BROWN	DASH NO. COLOR-RED	DASH NO. COLOR-ORANGE	DASH NO. COLOR-YELLOW	DASH NO. COLOR-GREEN	DASH NO. COLOR-BLUE	DASH NO. COLOR-VIOLET	DASH NO. COLOR-GREY
1	.021	.311-.289	.016 .024	1	26	51	76	101	126	151	176	201	226
2	.019	.278-.258		2	27	52	77	102	127	152	177	202	227
3	.017	.249-.229		3	28	53	78	103	128	153	178	203	228
4	.015	.224-.204		4	29	54	79	104	129	154	179	204	229
5	.014	.198-.182		5	30	55	80	105	130	155	180	205	230
6	.012	.178-.162		6	31	56	81	106	131	156	181	206	231
7	.011	.158-.144		7	32	57	82	107	132	157	182	207	232
8	.010	.141-.129		8	33	58	83	108	133	158	183	208	233
9	.007	.124-.114		9	34	59	84	109	134	159	184	209	234
10	.003	.112-.102	.013 .019	10	35	60	85	110	135	160	185	210	235
11	.003	.101-.091		11	36	61	86	111	136	161	186	211	236
12	.003	.089-.081		12	37	62	87	112	137	162	187	212	237
13	.002	.080-.072		13	38	63	88	113	138	163	188	213	238
14	.002	.072-.064		14	39	64	89	114	139	164	189	214	239
15	.002	.067-.057		15	40	65	90	115	140	165	190	215	240
16	.002	.061-.051		16	41	66	91	116	141	166	191	216	241
17	.002	.054-.045		17	42	67	92	117	142	167	192	217	242
18	.002	.049-.040		18	43	68	93	118	143	168	193	218	243
19	.002	.044-.036		19	44	69	94	119	144	169	194	219	244
20	.002	.039-.032		20	45	70	95	120	145	170	195	220	245
22	.002	.029-.025	.010 .014	21	46	71	96	121	146	171	196	221	246
24	.002	.027-.020		22	47	72	97	122	147	172	197	222	247
26	.001	.020-.016	.007 .011	23	48	73	98	123	148	173	198	223	248
28	.001	.017-.013		24	49	74	99	124	149	174	199	224	249
30	.001	.014-.010		25	50	75	100	125	150	175	200	225	250

Ⓖ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE
HEAT TREATMENT N/A
FINAL FINISH N/A

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 18 May 64
CHECKED A. Marto 5-22-64
APPROVAL G. MAYO 5/22/64
APPROVAL 5/22/64
NASA APPROVAL 5/26/64
MIT APPROVAL 5/26/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING
ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006776
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 K

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
G	REPLACES REV F WITH CHANGE PER TDRR 08859	5/26/64	DW
H	REVISED PER TDRR 10887	8 July 64	WK
J	REVISED PER TDRR 27363	3/24/66	WK
K	REVISED PER TDRR 28432	5-10-66	

REQUIREMENTS:

1. GENERAL

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SUPPLIER PROCESS AND QUALITY CONTROL, INCLUDING FINAL INSPECTION, SHALL BE IN ACCORDANCE WITH SPECIFICATION ND 1015404 CLASS 3.

C. EACH SHIPPING AND UNIT CONTAINER SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, ITEM NAME, NASA DRAWING NUMBER AND REVISION LETTER, NET CONTENTS AND LOT NUMBER.

2. ACCEPTANCE AND INSPECTION:

A. INSULATION ON SLEEVING SHALL BE POLYTETRAFLUOROETHYLENE RESIN, NON-RIGID, AND SHALL CONFORM TO THE ACCEPTANCE REQUIREMENTS OF MIL-I-22129 WITH THE FOLLOWING EXCEPTIONS:

(1) COLORS SHALL BE IN ACCORDANCE WITH MIL-STD-104 AND AS INDICATED BY THE DASH NUMBER, TABLE I, OF THIS DRAWING.

(2) INSIDE DIAMETER AND WALL THICKNESS SHALL BE IN ACCORDANCE WITH TABLE I OF THIS DRAWING.

B. CRACK AND SPLIT RESISTANCE

THE SLEEVING SHALL NOT SPLIT OR CRACK WHEN TESTED AS FOLLOWS:

ONE 6 INCH SAMPLE OF SLEEVING SHALL BE SELECTED FROM EACH END OF EACH COIL. INSERT A SOFT COPPER WIRE APPROXIMATELY .005 INCH SMALLER IN DIAMETER THAN THE MINIMUM SLEEVING I.D. AND WRAP THIS CONFIGURATION FIVE CLOSE TURNS UPON ITSELF. PREPARED SAMPLES SHALL BE PLACED IN A 550° TO 560°F. OVEN FOR 24 +1/2-0 HOURS. REMOVE SAMPLES FROM OVEN, COOL TO ROOM TEMPERATURE AND EXAMINE. REJECT ANY COIL FROM WHICH SAMPLES HAVE BEEN TAKEN THAT SHOW SPLITS OR CRACKS.

3. DESIGN REQUIREMENTS:

A. MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF MIL-I-22129 WITH THE EXCEPTION OF COLOR, INSIDE DIAMETER AND WALL THICKNESS WHICH SHALL BE AS SPECIFIED HEREIN.

B. INTENDED USE: THIS MATERIAL IS INTENDED FOR USE AS AN ELECTRICAL INSULATION SLEEVING WHICH WILL NOT SUPPORT COMBUSTION AND WHERE OPERATING TEMPERATURES RANGE FROM -65°C TO +260°C

C. TENSILE STRENGTH: 2500 P.S.I. MIN 6000 PSI MAX @ 200% ELONGATION (PER FEDERAL TEST METHOD STD. NO. 601, METHOD 4111) MINIMUM RETENTION OF INITIAL VALUE 95% AFTER AGING 96 HOURS AT 250° C

D. OPERATING TEMPERATURE RANGE: -65°C TO +260°C.

E. BREAKDOWN VOLTAGE: (MINIMUM VALUE REQUIRED VOLTS @ 60 CYCLES RMS) WALL THICKNESS

.009	11.500
.012	14.600
.016	16.300
.020	17.000

Ⓖ REPLACES REV (F) WITH CHANGE

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT N/A
FINAL FINISH N/A

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN CJ Papia DATE 18 May 64
CHECKED G. Marts 5-22-64
APPROVAL G. MAYO 5/26/64
APPROVAL D Diggins 5/22/64
NASA APPROVAL W Milach 5/26/64
MIT APPROVAL L Hazel 5/26/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING
ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006776
SCALE NONE WT SHEET 1 OF 2

MASTER

1006776 K

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006776 K

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
G	THIS SHEET ADDED PER TDRR 08859	5/26/64	
H	REVISED PER TDRR 10887		WK.
J	REVISED PER TDRR 27363	3/29/66	WK
K	REVISED PER TDRR 28432	5/10/71	

TABLE I

AWG SIZE	LB/FT CALC	DIMENSIONS I.D.	DIMENSIONS WALL THICKNESS	DASH NO. COLOR-WHITE	DASH NO. COLOR-BLACK	DASH NO. COLOR-BROWN	DASH NO. COLOR-RED	DASH NO. COLOR-ORANGE	DASH NO. COLOR-YELLOW	DASH NO. COLOR-GREEN	DASH NO. COLOR-BLUE	DASH NO. COLOR-VIOLET	DASH NO. COLOR-GREY
1	.021	.311-.289		1	26	51	76	101	126	151	176	201	226
2	.019	.278-.258		2	27	52	77	102	127	152	177	202	227
3	.017	.249-.229		3	28	53	78	103	128	153	178	203	228
4	.015	.224-.204		4	29	54	79	104	129	154	179	204	229
5	.014	.198-.182	.016	5	30	55	80	105	130	155	180	205	230
6	.012	.178-.162	.024	6	31	56	81	106	131	156	181	206	231
7	.011	.158-.144		7	32	57	82	107	132	157	182	207	232
8	.010	.141-.129		8	33	58	83	108	133	158	183	208	233
9	.007	.124-.114		9	34	59	84	109	134	159	184	209	234
10	.003	.112-.102		10	35	60	85	110	135	160	185	210	235
11	.003	.101-.091		11	36	61	86	111	136	161	186	211	236
12	.003	.089-.081		12	37	62	87	112	137	162	187	212	237
13	.002	.080-.072		13	38	63	88	113	138	163	188	213	238
14	.002	.072-.064	.013	14	39	64	89	114	139	164	189	214	239
15	.002	.067-.057	.019	15	40	65	90	115	140	165	190	215	240
16	.002	.061-.051		16	41	66	91	116	141	166	191	216	241
17	.002	.054-.045		17	42	67	92	117	142	167	192	217	242
18	.002	.049-.040		18	43	68	93	118	143	168	193	218	243
19	.002	.044-.036		19	44	69	94	119	144	169	194	219	244
20	.002	.039-.032		20	45	70	95	120	145	170	195	220	245
22	.002	.029-.025	.010	21	46	71	96	121	146	171	196	221	246
24	.002	.027-.020	.014	22	47	72	97	122	147	172	197	222	247
26	.001	.020-.016	.007	23	48	73	98	123	148	173	198	223	248
28	.001	.017-.013	.011	24	49	74	99	124	149	174	199	224	249
30	.001	.014-.010		25	50	75	100	125	150	175	200	225	250

Ⓖ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT N/A
FINAL FINISH N/A

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 8 May 64
CHECKED 5-22-64
APPROVAL G. MAYO 5/22/64
APPROVAL 5/22/64
NASA APPROVAL 5/26/64
MIT APPROVAL 5/26/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006776
SCALE NONE
WT
SHEET 2 OF 2

1006776

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129, EXCEPT AS HEREIN SPECIFIED.
   - A. AMBIENT TEMPERATURE RANGE: -90°C TO +204°C.
   - B. MATERIAL: POLYTETRAFLUOROETHYLENE RESIN PER MIL-T-14077, NON RIGID.
     COLOR: NATURAL (WHITE).
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. IDENTIFY PER MIL-STD-130
4. TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH MIL-I-22129.
5. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 SECTION 3.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00100 DATE 11-21-62

DASH NO	AWG SIZE	LB/FT CALC	DIMENSIONS	
			I.D.	WALL THICKNESS
1	1	.021	.311-.289	.016 .024
2	2	.019	.278-.258	
3	3	.017	.249-.229	
4	4	.015	.224-.204	
5	5	.014	.198-.182	
6	6	.012	.178-.162	
7	7	.011	.158-.144	
8	8	.010	.141-.129	
9	9	.007	.124-.114	
10	10	.003	.112-.102	.013 .019
11	11	.003	.101-.091	
12	12	.003	.089-.081	
13	13	.002	.080-.072	
14	14	.002	.072-.064	
15	15	.002	.067-.057	
16	16	.002	.061-.051	
17	17	.002	.054-.045	
18	18	.002	.049-.040	
19	19	.002	.044-.036	
20	20	.002	.039-.032	
21	22	.002	.029-.025	.010 -.014
22	24	.002	.027-.020	
23	26	.001	.020-.016	.007 -.011
24	28	.001	.017-.013	
25	30	.001	.014-.010	

ORIGINAL SOURCE OF SUPPLY:

SURPRENANT MANUFACTURING COMPANY
199 WASHINGTON STREET
BOSTON, MASSACHUSETTS
CODE IDENT NO. 78655
PART NO. N/A TYPE TTA

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT
NA

FINAL FINISH
NA

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN M. Callahan DATE 10-30-62
CHECKED D.M. Slaper 30 OCT 62
APPROVAL
APPROVAL
NASA APPROVAL 11-21-62
MIT APPROVAL W.A. Kupfer 21 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION SLEEVING ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006776

SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006777 Ⓜ

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 3 PER TDRR: 00433	2-20-63	WB WK

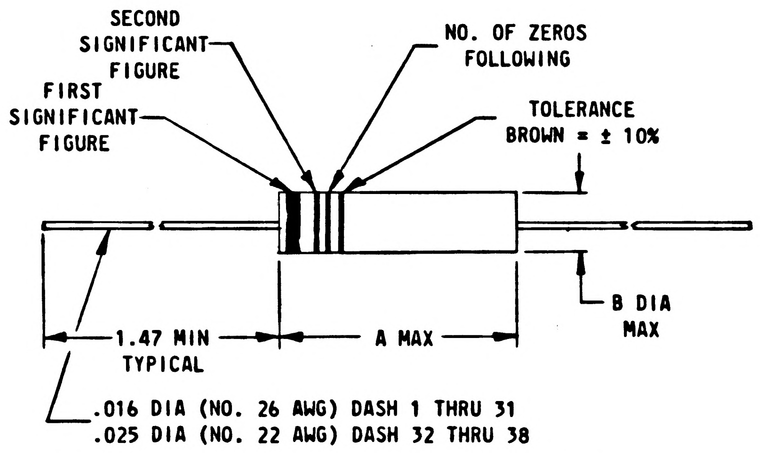
NOTES:

1. THESE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-11015 AND MIL-C-11015/20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED. IN CASE OF CONFLICT BETWEEN THIS DRAWING AND REFERENCED SPECS, THIS DRAWING SHALL GOVERN.
   - A. INSULATION RESISTANCE: 100 MICROFARAD-MEGOHMS OR 10,000 MEGOHMS WHICHEVER IS LESS.
   - B. VALUES MARKED • ARE NON-STANDARD VALUES PER MIL-C-11015/20 BUT SHALL MEET ALL THE OTHER REQUIREMENTS.
   - C. COLOR CODE: SHALL BE COLOR CODED WITH BANDS OR DOTS AS SHOWN IN FIGURE TO DENOTE CAPACITANCE VALUE IN PICOFARADS.
   - D. VOLTAGE RATING: 100 VDC AT 85°C DERATED TO 50 VDC AT 125°C
   - E. LEAD MATERIAL: (DUMET) IRON-NICKEL ALLOY, COPPER CLAD, ANNEALED AND GOLD PLATED IN ACCORDANCE WITH ND PS1015401.
   - F. MARKING: CAPACITORS SHALL BE MARKED WITH MANUFACTURER'S NAME OR SYMBOL, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND NASA PART NO.
   - G. PARTS SHALL MEET ENVIRONMENTAL REQUIREMENTS OF ND 1002000.
   - H. PARTS SHALL MEET QUALITY ASSURANCE PROVISIONS OF MIL-C-11015 AND SECTION 1 OF ND 1015404.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

	DASH NO.	CAP PF	A	B
	-1	10	.318	.090
•	-2	20	↓	↓
	-3	22	↓	↓
	-4	33	↓	↓
•	-5	36	↓	↓
•	-6	37	↓	↓
	-7	47	↓	↓
•	-8	50	↓	↓
•	-9	56	↓	↓
•	-10	68	↓	↓
•	-11	75	↓	↓
•	-12	82	↓	↓
	-13	100	↓	↓
•	-14	130	↓	↓
•	-15	150	↓	↓
	-16	220	↓	↓
•	-17	270	↓	↓
	-18	330	↓	↓
•	-19	360	↓	↓
	-20	470	↓	↓
•	-21	560	↓	↓
•	-22	680	↓	↓
•	-23	820	↓	↓
	-24	1000	.318	.090
•	-25	2000	.498	.120
	-26	2200	↓	↓
	-27	3300	↓	↓
	-28	4700	↓	↓
•	-29	5000	.498	.120
•	-30	6800	.498	.160
		MF		
	-31	.010	.498	.160
•	-32	.020	.498	.200
	-33	.022	.648	.240
•	-34	.033	.648	.240
	-35	.047	.648	.240
•	-36	.050	.648	.240
•	-37	.068	.748	.280
	-38	.100	.748	.280

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62



UNLESS SPECIFIED, STANDARD COLOR CODE BLACK = 0 THRU WHITE = 9

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

FOR SOURCE OF SUPPLY:

SEE QUALIFIED VENDOR LIST ND 1002034

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. WHEELER DATE 21NOV62
CHECKED D.M. SLEEPER 27NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006777
SCALE NONE WT SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006777

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 3 PER TDRR: 00433	2-20-63	WB WK
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WK

NOTES:

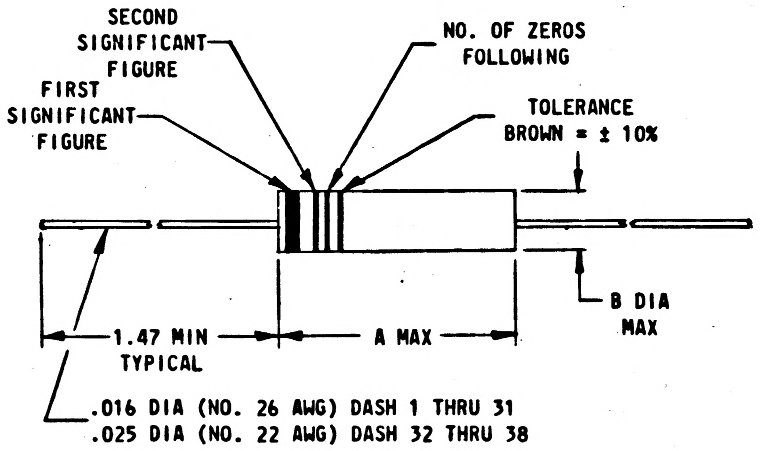
1. THESE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-11015 AND MIL-C-11015/20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED. IN CASE OF CONFLICT BETWEEN THIS DRAWING AND REFERENCED SPECS, THIS DRAWING SHALL GOVERN.
   - A. INSULATION RESISTANCE: 100 MICROFARAD-MEGOHMS OR 10,000 MEGOHMS WHICHEVER IS LESS.
   - B. VALUES MARKED • ARE NON-STANDARD VALUES PER MIL-C-11015/20 BUT SHALL MEET ALL THE OTHER REQUIREMENTS.
   - C. COLOR CODE: SHALL BE COLOR CODED WITH BANDS OR DOTS AS SHOWN IN FIGURE TO DENOTE CAPACITANCE VALUE IN PICOFARADS.
   - D. VOLTAGE RATING: 100 VDC AT 85°C DERATED TO 50 VDC AT 125°C
   - E. LEAD MATERIAL: (DUMET) IRON-NICKEL ALLOY, COPPER CLAD, ANNEALED AND GOLD PLATED IN ACCORDANCE WITH ND PS1015401.
   - F. MARKING: CAPACITORS SHALL BE MARKED WITH MANUFACTURER'S NAME OR SYMBOL, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND NASA PART NO.
   - G. PARTS SHALL MEET ENVIRONMENTAL REQUIREMENTS OF ND 1002000.
   - H. PARTS SHALL MEET QUALITY ASSURANCE PROVISIONS OF MIL-C-11015 AND SECTION 1 OF ND 1015404.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

DASH NO.	CAP PF	A	B
-1	10	.318	.090
• -2	20	↓	↓
-3	22	↓	↓
-4	33	↓	↓
• -5	36	↓	↓
• -6	37	↓	↓
-7	47	↓	↓
• -8	50	↓	↓
• -9	56	↓	↓
• -10	68	↓	↓
• -11	75	↓	↓
• -12	82	↓	↓
-13	100	↓	↓
• -14	130	↓	↓
• -15	150	↓	↓
-16	220	↓	↓
• -17	270	↓	↓
-18	330	↓	↓
• -19	360	↓	↓
-20	470	↓	↓
• -21	560	↓	↓
• -22	680	↓	↓
• -23	820	↓	↓
-24	1000	.318	.090
• -25	2000	.498	.120
-26	2200	↓	↓
-27	3300	↓	↓
-28	4700	↓	↓
• -29	5000	.498	.120
• -30	6800	.498	.160
	MF		
-31	.010	.498	.160
• -32	.020	.498	.200
-33	.022	.648	.240
• -34	.033	.648	.240
-35	.047	.648	.240
• -36	.050	.648	.240
• -37	.068	.748	.280
-38	.100	.748	.280

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

Ⓑ REPLACED WITH CHANGE BY REV C



UNLESS SPECIFIED, STANDARD COLOR CODE BLACK = 0 THRU WHITE = 9

MASTER

FOR SOURCE OF SUPPLY:
SEE QUALIFIED VENDOR LIST
ND 1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. WHEELER DATE 21 NOV 62
CHECKED D. M. SLEEPER 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006777
SCALE NONE WT SHEET 1 OF 1

1006777 B

C 1006777

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER: AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

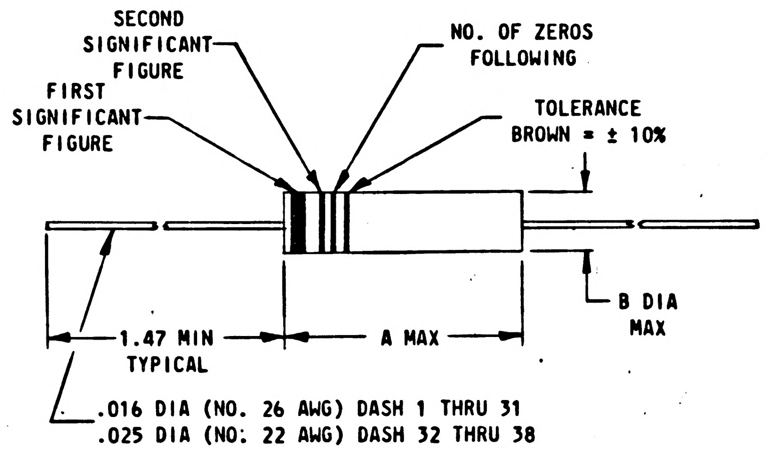
NOTES:

1. THESE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-11015 AND MIL-C-11015/20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED. IN CASE OF CONFLICT BETWEEN THIS DRAWING AND REFERENCED SPECS, THIS DRAWING SHALL GOVERN.
   - A. INSULATION RESISTANCE: 100 MICROFARAD-MEGOHMS OR 10,000 MEGOHMS WHICHEVER IS LESS.
   - B. VALUES MARKED * ARE NON-STANDARD VALUES PER MIL-C-11015/20 BUT SHALL MEET ALL THE OTHER REQUIREMENTS.
   - C. COLOR CODE: SHALL BE COLOR CODED WITH BANDS OR DOTS AS SHOWN IN FIGURE TO DENOTE CAPACITANCE VALUE IN PICOFARADS.
   - D. VOLTAGE RATING: 100 VDC AT 85°C DERATED TO 50 VDC AT 125°C
   - E. LEAD MATERIAL: (DUMET) IRON-NICKEL ALLOY, COPPER CLAD, ANNEALED AND GOLD PLATED IN ACCORDANCE WITH ND PS1015401.
   - F. MARKING: CAPACITORS SHALL BE MARKED WITH MANUFACTURER'S NAME OR SYMBOL, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND NASA PART NO.
   - G. PARTS SHALL MEET ENVIRONMENTAL REQUIREMENTS OF ND 1002000.
   - H. PARTS SHALL MEET QUALITY ASSURANCE PROVISIONS OF MIL-C-11015 AND SECTION 1 OF ND 1015404.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

	DASH NO.	CAP PF	A	B
	-1	10	.318	.090
*	-2	20		
	-3	22		
	-4	33		
*	-5	36		
*	-6	37		
	-7	47		
*	-8	50		
*	-9	56		
*	-10	68		
*	-11	75		
*	-12	82		
	-13	100		
*	-14	130		
*	-15	150		
	-16	220		
*	-17	270		
	-18	330		
*	-19	360		
	-20	470		
*	-21	560		
*	-22	680		
*	-23	820		
	-24	1000	.318	.090
*	-25	2000	.498	.120
	-26	2200		
	-27	3300		
	-28	4700		
*	-29	5000	.498	.120
*	-30	6800	.498	.160
		MF		
	-31	.010	.498	.160
*	-32	.020	.498	.200
	-33	.022	.648	.240
*	-34	.033	.648	.240
	-35	.047	.648	.240
*	-36	.050	.648	.240
*	-37	.068	.748	.280
	-38	.100	.748	.280

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62



UNLESS SPECIFIED, STANDARD COLOR CODE BLACK = 0 THRU WHITE = 9

Ⓒ REPLACES REV C WITH CHANGE

MASTER

FOR SOURCE OF SUPPLY:

SEE QUALIFIED VENDOR LIST
ND 1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. WHEELER DATE 21 NOV 62
CHECKED D. M. SLEEPER 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006777

SCALE NONE WT SHEET 1 OF 1

1006777 C

D 1006777

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513		WK
D	REPLACED BY REV E WITH CHANGES PER TDRR 02885		

M

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

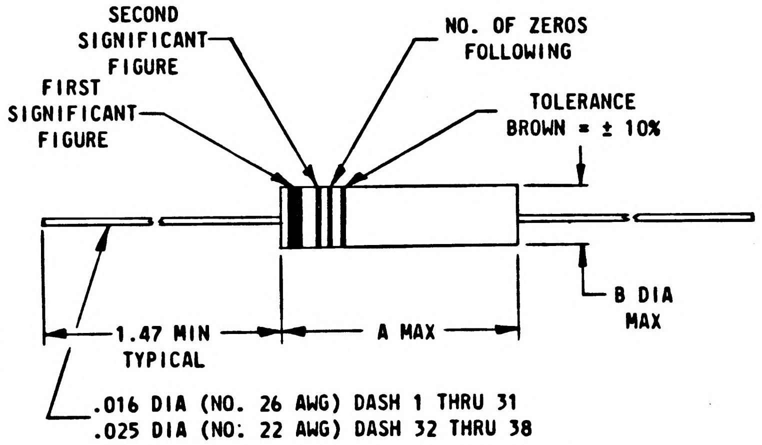
NOTES:

1. THESE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-11015 AND MIL-C-11015/20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED. IN CASE OF CONFLICT BETWEEN THIS DRAWING AND REFERENCED SPECS, THIS DRAWING SHALL GOVERN.
   - A. INSULATION RESISTANCE: 100 MICROFARAD-MEGOHMS OR 10,000 MEGOHMS WHICHEVER IS LESS.
   - B. VALUES MARKED * ARE NON-STANDARD VALUES PER MIL-C-11015/20 BUT SHALL MEET ALL THE OTHER REQUIREMENTS.
   - C. COLOR CODE: SHALL BE COLOR CODED WITH BANDS OR DOTS AS SHOWN IN FIGURE TO DENOTE CAPACITANCE VALUE IN PICOFARADS.
   - D. VOLTAGE RATING: 100 VDC AT 85°C DERATED TO 50 VDC AT 125°C
   - E. LEAD MATERIAL: (DUMET) IRON-NICKEL ALLOY, COPPER CLAD, ANNEALED AND GOLD PLATED IN ACCORDANCE WITH ND PS1015401.
   - F. MARKING: CAPACITORS SHALL BE MARKED WITH MANUFACTURER'S NAME OR SYMBOL, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND NASA PART NO.
   - G. PARTS SHALL MEET ENVIRONMENTAL REQUIREMENTS OF ND 1002000.
   - H. PARTS SHALL MEET QUALITY ASSURANCE PROVISIONS OF MIL-C-11015 AND SECTION 1 OF ND 1015404.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

	DASH NO.	CAP PF	A	B
	-1	10	.318	.090
*	-2	20	↓	↓
	-3	22	↓	↓
	-4	33	↓	↓
*	-5	36	↓	↓
*	-6	37	↓	↓
	-7	47	↓	↓
*	-8	50	↓	↓
*	-9	56	↓	↓
*	-10	68	↓	↓
*	-11	75	↓	↓
*	-12	82	↓	↓
	-13	100	↓	↓
*	-14	130	↓	↓
*	-15	150	↓	↓
	-16	220	↓	↓
*	-17	270	↓	↓
	-18	330	↓	↓
*	-19	360	↓	↓
	-20	470	↓	↓
*	-21	560	↓	↓
*	-22	680	↓	↓
*	-23	820	↓	↓
	-24	1000	.318	.090
*	-25	2000	.498	.120
	-26	2200	↓	↓
	-27	3300	↓	↓
	-28	4700	↓	↓
*	-29	5000	.498	.120
*	-30	6800	.498	.160
		MF		
	-31	.010	.498	.160
*	-32	.020	.498	.200
	-33	.022	.648	.240
*	-34	.033	.648	.240
	-35	.047	.648	.240
*	-36	.050	.648	.240
*	-37	.068	.748	.280
	-38	.100	.748	.280

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62



UNLESS SPECIFIED, STANDARD COLOR CODE BLACK = 0 THRU WHITE = 9

Ⓓ REPLACED BY REV E WITH CHANGES

Ⓒ REPLACES REV C WITH CHANGE

MASTER

FOR SOURCE OF SUPPLY:

SEE QUALIFIED VENDOR LIST
ND 1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. WHEELER DATE 21NOV62
CHECKED D. M. SLEEPER 27NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

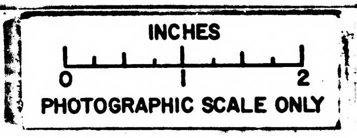
CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006777

SCALE NONE WT SHEET 1 OF 1

1006777 D



1 00165' 12-12-62

E 1006777

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02885	8/28/82	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

GENERAL:

INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.

SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.

UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:

- EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
- LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
- BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.

UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

INSPECTION AND ACCEPTANCE:

MECHANICAL REQUIREMENTS:

DIMENSIONS PER OUTLINE AND TABLE I

LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

MARKING: PER MIL-STD-130, EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE P[illegible] MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.

ELECTRICAL REQUIREMENTS:

CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.

POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 MC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1MC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

DESIGN REQUIREMENTS:

PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

DC WORKING VOLTAGE: 100 VOLTS AT +85°C. DERATED TO 50 VOLTS AT +125°C.

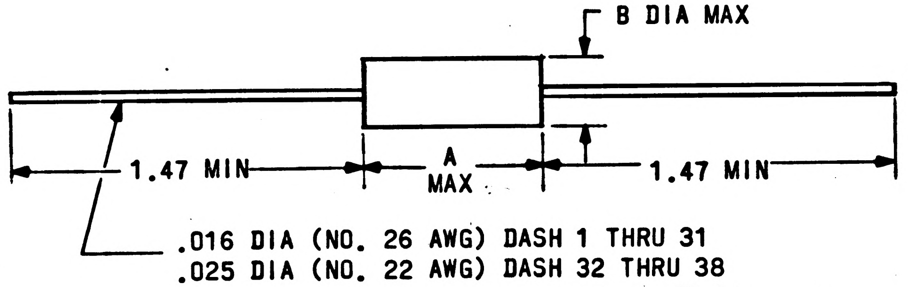
OPERATING TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING.

LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.

ENVIRONMENTAL:

REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.

LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 31
.025 DIA (NO. 22 AWG) DASH 32 THRU 38

E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.005 ±.02 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT NAS 9-497
DRAWN DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/24/82
MIT APPROVAL 8/20/82

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006777
SCALE NONE WT SHEET 1 OF 2

1006777 E

MASTER

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

100165 12-12-62

1006777 E

SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5	8/28/63	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

SPECIAL CONDITIONING BY SUPPLIER:

BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (ie SHORTS OR OPENS)

THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

CAPACITANCE
POWER FACTOR
INSULATION RESISTANCE

BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:
CAPACITANCE: ± 5 % OF INITIAL READING
POWER FACTOR: INITIAL LIMIT
INSULATION RESISTANCE: INITIAL LIMIT

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.095
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.095
* -25	2000	.498	.125
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.125
* -30	6800	.498	.165
	UF		
-31	.010	.498	.165
* -32	.020	.498	.205
-33	.022	.698	.245
* -34	.033	.648	.245
-35	.047	.648	.245
* -36	.050	.648	.245
* -37	.068	.748	.285
-38	.100	.748	.285

NOTES:
1.* THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497
DRAWN Foster DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Elden C Hall 28 Aug 63
NASA APPROVAL K Michael 8/28/63
MIT APPROVAL R Hazel 8/20/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

1006777 E

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1 00165 12-12-62

1006777 F

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02F F5	8/28/62	
F	REVISED PER TDRR 03962	15Oct63	WK

Ⓜ

REQUIREMENTS:

GENERAL:

INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.

SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.

UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:

EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.

LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.

BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.

UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

INSPECTION AND ACCEPTANCE:

MECHANICAL REQUIREMENTS:

DIMENSIONS PER OUTLINE AND TABLE I

LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

MARKING: PER MIL-STD-130, EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.

ELECTRICAL REQUIREMENTS:

CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.

POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 MC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1MC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

DESIGN REQUIREMENTS:

PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

DC WORKING VOLTAGE: 100 VOLTS AT +85°C, DERATED TO 50 VOLTS AT +125°C.

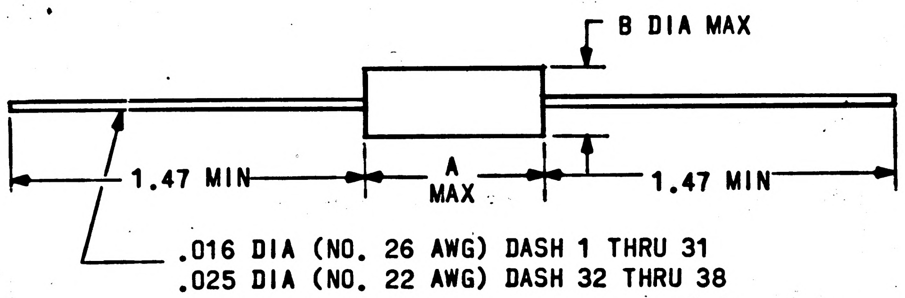
OPERATING TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING.

LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.

ENVIRONMENTAL:

REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.

LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 31
.025 DIA (NO. 22 AWG) DASH 32 THRU 38

F	F
E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± .005 ± .02
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497
DRAWN [illegible] DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL [illegible] 8/26/63
MIT APPROVAL R Hazel 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

100165 12-12-62

1006777 F

SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02PF5		
F	REVISED PER TDRR 03962		

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

SPECIAL CONDITIONING BY SUPPLIER:

BURN–IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (ie SHORTS OR OPENS)

THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

- CAPACITANCE
- POWER FACTOR
- INSULATION RESISTANCE

BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:

CAPACITANCE: ± 5 % OF INITIAL READING
POWER FACTOR: INITIAL LIMIT
INSULATION RESISTANCE: INITIAL LIMIT

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.090
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280

NOTES:

1. * THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497
DRAWN PJ Foster DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/28/63
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1 00165 12-12-62

1006777 G

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02885	8/28/63	
F	REVISED PER TDRR 03962	15 Oct 63	WK
G	REVISED PER TDRR 06749	3/10/64	WK

Ⓜ

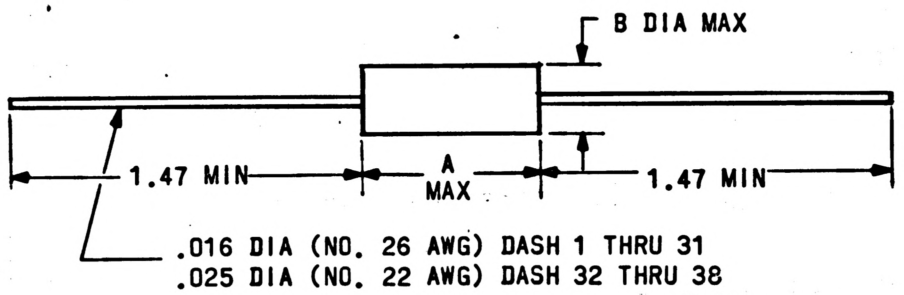
Ⓐ

REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   D. PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
      EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
      LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
      BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   E. UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE:
   A. MECHANICAL REQUIREMENTS:
      1. DIMENSIONS PER OUTLINE AND TABLE I
      2. LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
      3. MARKING: PER ND1002019 , EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   B. ELECTRICAL REQUIREMENTS:
      1. CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
      2. CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
      3. INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.
      4. POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 MC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1MC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

3. DESIGN REQUIREMENTS:
   A. PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   B. DC WORKING VOLTAGE: 100 VOLTS AT +85°C. DERATED TO 50 VOLTS AT +125°C.
   C. OPERATING AND STORAGE TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING. ALLOWANCE SHOULD BE MADE FOR CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE AS INDICATED IN TABLE II.
   D. LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   E. ENVIRONMENTAL:
      1. REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.
      2. LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 31
.025 DIA (NO. 22 AWG) DASH 32 THRU 38

G	G
F	F
E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.005 ±.02 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497
DRAWN [illegible] DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL [illegible] 8/26/63
MIT APPROVAL [illegible] 8/26/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

100165 12-12-62

G	1006777

SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02PF5	8/25/63	
F	REVISED PER TDRR 0396.2	15Oct63	WC
G	REVISED PER TDRR 06749	3/10/64	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (ie SHORTS OR OPENS)

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

CAPACITANCE
POWER FACTOR
INSULATION RESISTANCE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:
CAPACITANCE: ± 5 % OF INITIAL READING
POWER FACTOR: INITIAL LIMIT
INSULATION RESISTANCE: INITIAL LIMIT

NOTES:

1.* THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

TABLE II
MAXIMUM CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE

DASH NO.	CAPACITANCE CHANGE (%) WITH EXPOSURE TO INDICATED TEMPERATURES (°C)			
	+55	+75	+85	+125
1 THRU 10	<1.0	<1.0	1.0	1.5
11 THRU 18	2.3	4.5	7.5	9.0
19 THRU 24	6.0	12.5	15.0	25.0
24 THRU 38	3.8	7.5	10.0	15.0

TABLE I

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.090
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497
DRAWN CJ Foster DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/28/63
MIT APPROVAL 8/30/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1 00165' 12-12-62

H 1006777

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE — PER TDRR 02885	8/28/63	
F	REVISED PER TDRR 03962	10 Oct 63	WK
G	REVISED PER TDRR 06749	3/10/64	EPK WK
H	REVISED PER TDRR 07590	4/30/64	EPK WK

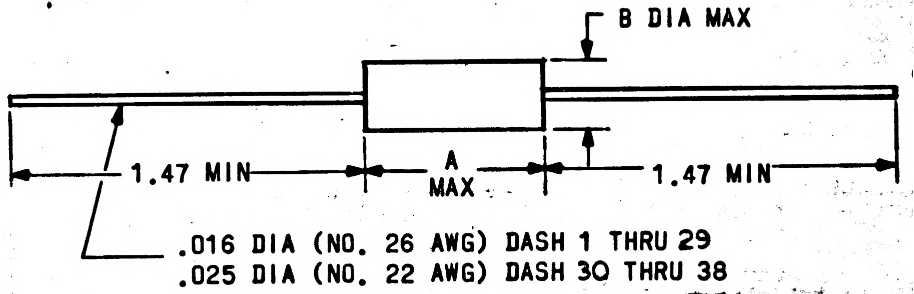
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - 1.) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - 2.) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - 3.) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - 1.) DIMENSIONS PER OUTLINE AND TABLE I
     - 2.) LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 3.) MARKING: ~~PER ND1002019~~ , EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   - B. ELECTRICAL REQUIREMENTS:
     - 1.) CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 2.) CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 3.) INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.
     - 4.) POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 MC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1MC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

3. DESIGN REQUIREMENTS:
   - A. PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. DC WORKING VOLTAGE: 100 VOLTS AT +85°C, DERATED TO 50 VOLTS AT +125°C.
   - C. OPERATING AND STORAGE TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING. ALLOWANCE SHOULD BE MADE FOR CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE AS INDICATED IN TABLE II.
   - D. LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - E. ENVIRONMENTAL:
     - 1.) REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.
     - 2.) LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 29
.025 DIA (NO. 22 AWG) DASH 30 THRU 38

H	H
G	G
F	F
E	E
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±— DECIMALS ±.005 ±.02 ANGLES ±—
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497
DRAWN DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/26/63
MIT APPROVAL 8/26/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

100165 12-12-6

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

H

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5	8/28/63	
F	REVISED PER TDRR Q396.2	10/8/63	WC
G	REVISED PER TDRR 06749	3/10/64	WC
H	REVISED PER TDRR 07590	9/21/64	WC

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN—IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (i.e. SHORTS OR OPENS)

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

CAPACITANCE
POWER FACTOR
INSULATION RESISTANCE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:
CAPACITANCE: ± 5 % OF INITIAL READING
POWER FACTOR: INITIAL LIMIT
INSULATION RESISTANCE: INITIAL LIMIT

TABLE I

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.090
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280

NOTES:

1.* THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

TABLE II
MAXIMUM CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE

DASH NO.	CAPACITANCE CHANGE (%) WITH EXPOSURE TO INDICATED TEMPERATURES (°C)			
	+55	+75	+85	+125
1 THRU 10	<1.0	<1.0	1.0	1.5
11 THRU 18	2.3	4.5	7.5	9.0
19 THRU 24	6.0	12.5	15.0	25.0
25 THRU 38	3.8	7.5	10.0	15.0

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG. NO
CONTRACT NAS 9-497

DRAWN DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/28/63
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1 00165 12-12-62

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

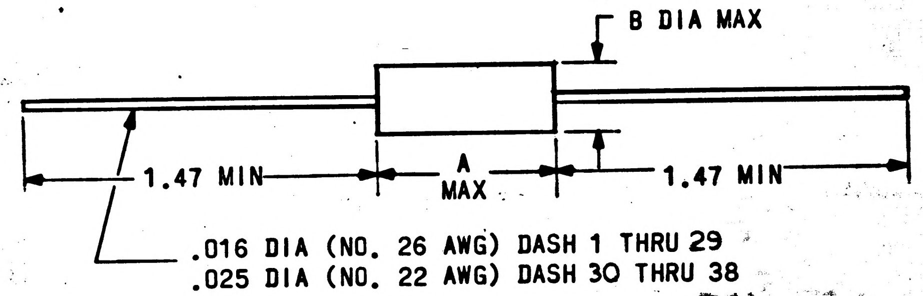
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE. PER TDRR 02F F5	8/28/63	
F	REVISED PER TDRR 03962	10 Oct 63	WK
G	REVISED PER TDRR 06749	3/10/64	EPK WK
H	REVISED PER TDRR 07590	4/24/64	EPK WK
J	REVISED PER TDRR 10373	6/24/64	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - 1.) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - 2.) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - 3.) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - 1.) DIMENSIONS PER OUTLINE AND TABLE I
     - 2.) LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 3.) MARKING: ~~PER ND1002019~~ , EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   - B. ELECTRICAL REQUIREMENTS:
     - 1.) CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 2.) CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 3.) INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.
     - 4.) POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 MC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1MC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

3. DESIGN REQUIREMENTS:
   - A. PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. DC WORKING VOLTAGE: 100 VOLTS AT +85°C. DERATED TO 50 VOLTS AT +125°C.
   - C. OPERATING AND STORAGE TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING. ALLOWANCE SHOULD BE MADE FOR CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE AS INDICATED IN TABLE II.
   - D. LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - E. ENVIRONMENTAL:
     - 1.) REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.
     - 2.) LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 29
.025 DIA (NO. 22 AWG) DASH 30 THRU 38

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±— DECIMALS ±.005 ±.02 ANGLES ±—
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497
DRAWN Baxter DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 aug 63
NASA APPROVAL 8/24/63
MIT APPROVAL 8/20/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

100165 12-12-62

1006777 7

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5	8/28/63	
F	REVISED PER TDRR Q3962	10Oct63	WK
G	REVISED PER TDRR 06749	3/10/64	WK
H	REVISED PER TDRR 07590	4/21/64	WK
J	REVISED PER TDRR 10373	6/24/64	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (ie. SHORTS OR OPENS)

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

- CAPACITANCE
- POWER FACTOR
- INSULATION RESISTANCE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:

CAPACITANCE: ± 5 % OF INITIAL READING

POWER FACTOR: INITIAL LIMIT

INSULATION RESISTANCE: INITIAL LIMIT

TABLE I

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.090
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280
-39	.015	.498	.200

NOTES:

1.* THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

TABLE II
MAXIMUM CAPACITANCE CHANGE DUE
TO HIGH TEMPERATURE EXPOSURE

DASH NO.	CAPACITANCE CHANGE (%) WITH EXPOSURE TO INDICATED TEMPERATURES (°C)			
	+55	+75	+85	+125
1 THRU 10	<1.0	<1.0	1.0	1.5
11 THRU 18	2.3	4.5	7.5	9.0
19 THRU 24	6.0	12.5	15.0	25.0
25 THRU 39	3.8	7.5	10.0	15.0

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO
CONTRACT NAS 9-497
DRAWN C.P. Foster DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/28/63
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1 00165 12-12-62

1006777 K

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REVISIONS

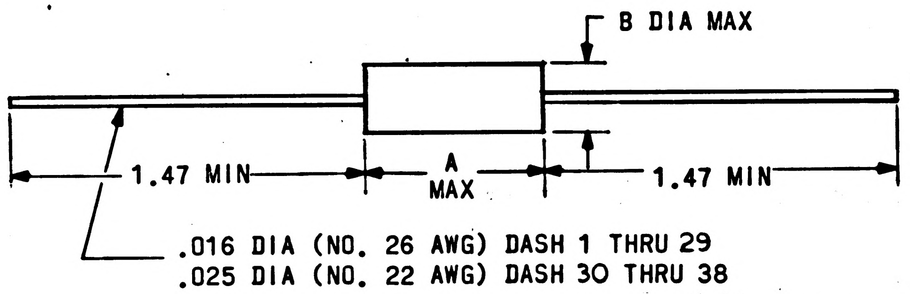
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02885	8/28/62	
F	REVISED PER TDRR 03962	15 Oct 63	WK
G	REVISED PER TDRR 06749	3/10/64	RPK WK
H	REVISED PER TDRR 07590	4/21/64	RPK WK
J	REVISED PER TDRR 10373	6/24/64	WK
K	REVISED PER TDRR 18629	5/4/65	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - 1.) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - 2.) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - 3.) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - 1.) DIMENSIONS PER OUTLINE AND TABLE I
     - 2.) LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 3.) MARKING: PER ND1002019 , EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   - B. ELECTRICAL REQUIREMENTS:
     - 1.) CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 2.) CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 3.) INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.
     - 4.) POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 MC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1MC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

3. DESIGN REQUIREMENTS:
   - A. PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. DC WORKING VOLTAGE: 100 VOLTS AT +85°C, DERATED TO 50 VOLTS AT +125°C.
   - C. OPERATING AND STORAGE TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING. ALLOWANCE SHOULD BE MADE FOR CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE AS INDICATED IN TABLE II.
   - D. LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THE LEAD SHALL BE BENT AT THE POINT OF EGRESS FROM THE CAPACITOR BODY AROUND A 1/16 INCH RADIUS. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - E. ENVIRONMENTAL:
     - 1.) REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.
     - 2.) LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 29
.025 DIA (NO. 22 AWG) DASH 30 THRU 38

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.005 ±.02 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT NAS 9-497
DRAWN DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/26/63
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006777
SCALE NONE WT SHEET 1 OF 2

1006777

100165 12-12-62

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5	8/25/63	
F	REVISED PER TDRR Q3962	15Oct63	WK
G	REVISED PER TDRR 06749	3/10/64	EPK WK
H	REVISED PER TDRR 07590	4/21/64	EPK WK
J	REVISED PER TDRR 10373	6/24/64	WK
K	REVISED PER TDRR 18629	6/4/65	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (i.e. SHORTS OR OPENS)

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

CAPACITANCE
POWER FACTOR
INSULATION RESISTANCE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:
CAPACITANCE: ± 5 % OF INITIAL READING
POWER FACTOR: INITIAL LIMIT
INSULATION RESISTANCE: INITIAL LIMIT

NOTES:

1.* THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

TABLE II
MAXIMUM CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE

DASH NO.	CAPACITANCE CHANGE (%) WITH EXPOSURE TO INDICATED TEMPERATURES (°C)			
	+55	+75	+85	+125
1 THRU 10	<1.0	<1.0	1.0	1.5
11 THRU 18	2.3	4.5	7.5	9.0
19 THRU 24	6.0	12.5	15.0	25.0
25 THRU 39	3.8	7.5	10.0	15.0

TABLE I

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.090
* -2	20	↓	↓
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200	↓	↓
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280
-39	.015	.498	.200

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT NAS 9-497
DRAWN C.J. Foster DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL K Michael 8/28/63
MIT APPROVAL R Nadel 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

1 00165' 12-12-62

1006777 L

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

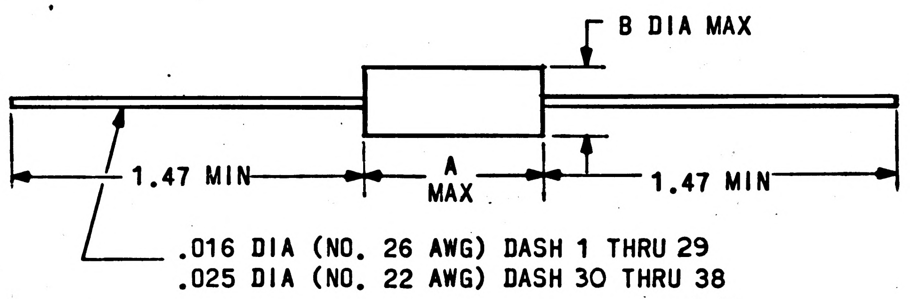
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02885	8/28/62	
F	REVISED PER TDRR 03962	15 Oct 63	WK
G	REVISED PER TDRR 06749	3/10/64	EPK WK
H	REVISED PER TDRR 07590	4/21/64	EPK WK
J	REVISED PER TDRR 10373	6/24/64	WK
K	REVISED PER TDRR 18629	5/4/65	WK
L	REVISED PER TDRR 22281	9-8-65	MGM 9/14

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - 1.) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - 2.) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - 3.) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - 1.) DIMENSIONS PER OUTLINE AND TABLE I
     - 2.) LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 3.) MARKING: PER ND1002019, EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   - B. ELECTRICAL REQUIREMENTS:
     - 1.) CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 2.) CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 3.) INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.
     - 4.) POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

3. DESIGN REQUIREMENTS:
   - A. PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. DC WORKING VOLTAGE: 100 VOLTS AT +85°C. DERATED TO 50 VOLTS AT +125°C.
   - C. OPERATING AND STORAGE TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING. ALLOWANCE SHOULD BE MADE FOR CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE AS INDICATED IN TABLE II.
   - D. LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THE LEAD SHALL BE BENT AT THE POINT OF EGRESS FROM THE CAPACITOR BODY AROUND A 1/16 INCH RADIUS. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - E. ENVIRONMENTAL:
     - 1.) REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.
     - 2.) LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 29
.025 DIA (NO. 22 AWG) DASH 30 THRU 38

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.005 ±.02 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT NAS 9-497

DRAWN [illegible] DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL [illegible] 8/24/63
MIT APPROVAL R Hazel 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006777

SCALE NONE WT SHEET 1 OF 2

100165 12-12-6

1006777

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5	8/28/63	
F	REVISED PER TDRR 03962	15Oct63	WK
G	REVISED PER TDRR 06749	3/10/64	EPK WK
H	REVISED PER TDRR 07590	4/21/64	EPK WK
J	REVISED PER TDRR 10373	6/24/64	WK
K	REVISED PER TDRR 18629	6/4/65	WK
L	REVISED PER TDRR 22281	9/8/65	MGM 9/14

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (i.e. SHORTS OR OPENS)

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

CAPACITANCE
POWER FACTOR
INSULATION RESISTANCE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:
CAPACITANCE: ± 5 % OF INITIAL READING
POWER FACTOR: INITIAL LIMIT
INSULATION RESISTANCE: INITIAL LIMIT

TABLE I

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.090
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280
-39	.015	.498	.200

NOTES:

1.* THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

TABLE II
MAXIMUM CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE

DASH NO.	CAPACITANCE CHANGE (%) WITH EXPOSURE TO INDICATED TEMPERATURES (°C)			
	+55	+75	+85	+125
1 THRU 10	<1.0	<1.0	1.0	1.5
11 THRU 18	2.3	4.5	7.5	9.0
19 THRU 24	6.0	12.5	15.0	25.0
25 THRU 39	3.8	7.5	10.0	15.0

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO
CONTRACT NAS 9-497

DRAWN P.G. Foster DATE 13AUG63
CHECKED Wilson 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL R Michael 8/28/63
MIT APPROVAL R Hazel 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006777

SCALE NONE WT SHEET 2 OF 2

00165 12-12-62

1006777 M

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

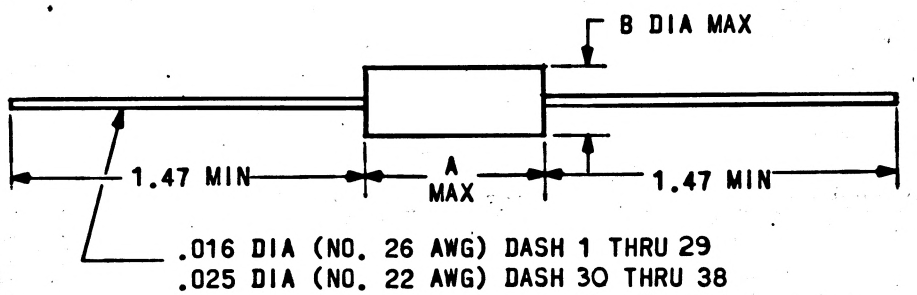
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5	8/28/63	
F	REVISED PER TDRR 03962	10 Oct 63	WK
G	REVISED PER TDRR 06749	3/10/64	EPK WK
H	REVISED PER TDRR 07590	4/31/64	EPK WK
J	REVISED PER TDRR 10373	6/24/64	WK
K	REVISED PER TDRR 18629	5/4/65	WK
L	REVISED PER TDRR 22281	9-8-65	9/14
M	REVISED PER TDRR 25134	1/18/66	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - 1.) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - 2.) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - 3.) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - 1.) DIMENSIONS PER OUTLINE AND TABLE I
     - 2.) LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 3.) MARKING: PER ND1002019, EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   - B. ELECTRICAL REQUIREMENTS:
     - 1.) CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 2.) CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 3.) INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.
     - 4.) POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

3. DESIGN REQUIREMENTS:
   - A. PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. DC WORKING VOLTAGE: 100 VOLTS AT +85°C. DERATED TO 50 VOLTS AT +125°C.
   - C. OPERATING AND STORAGE TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING. ALLOWANCE SHOULD BE MADE FOR CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE AS INDICATED IN TABLE II.
   - D. LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THE LEAD SHALL BE BENT AT THE POINT OF EGRESS FROM THE CAPACITOR BODY AROUND A 1/16 INCH RADIUS. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - E. ENVIRONMENTAL:
     - 1.) REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.
     - 2.) LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) DASH 1 THRU 29
.025 DIA (NO. 22 AWG) DASH 30 THRU 38

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ±.005 ±.02 ANGLES ± — DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE MASS DWG NO CONTRACT NAS 9-497
APPLICATION		MATERIAL	DRAWN Baxter DATE 13AUG63 CHECKED WILSON 14 AUG 63 APPROVAL APPROVAL Eldon C Hall 28 Aug 63
		HEAT TREATMENT	NASA APPROVAL 8/28/63
		FINAL FINISH	MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER HOUSTON, TEXAS			
CAPACITOR, FIXED, CERAMIC DIELECTRIC SPECIFICATION CONTROL DRAWING			
CODE IDENT NO. 80230	SIZE C	NASA DRAWING NO. 1006777	
SCALE NONE	WT		SHEET 1 OF 2

1006777 M

100165 12-12-62

W 1006777

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5		
F	REVISED PER TDRR 0396.2	15Oct63	WR
G	REVISED PER TDRR 06749	3/10/64	epk WR
H	REVISED PER TDRR 07590	4/21/64	epk WR
J	REVISED PER TDRR 10373	6/2/64	WR
K	REVISED PER TDRR 18629	6/4/65	WR
L	REVISED PER TDRR 22281	9/8/65	MGM 9/14
M	REVISED PER TDRR 25134	1/18/66	WR

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (ie. SHORTS OR OPENS)

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

CAPACITANCE
POWER FACTOR
INSULATION RESISTANCE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:
CAPACITANCE: ± 5 % OF INITIAL READING
POWER FACTOR: INITIAL LIMIT
INSULATION RESISTANCE: INITIAL LIMIT

TABLE I

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-1	10	.318	.090
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280
-39	.015	.498	.200

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	DIMENSIONS B
-40	5600	.498	.160
-41	8200	.498	.160

NOTES:

1.* THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

TABLE II
MAXIMUM CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE

DASH NO.	CAPACITANCE CHANGE (%) WITH EXPOSURE TO INDICATED TEMPERATURES (°C)			
	+55	+75	+85	+125
1 THRU 10	<1.0	<1.0	1.0	1.5
11 THRU 18	2.3	4.5	7.5	9.0
19 THRU 24	6.0	12.5	15.0	25.0
25 THRU 39	3.8	7.5	10.0	15.0

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT NAS 9-497

DRAWN PJ Foster DATE 13 AUG63
CHECKED Wilson 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/28/63
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

N 1006777

SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02F85	8/28/63	
F	REVISED PER TDRR 03962	10Oct63	WK
G	REVISED PER TDRR 06749	3/10/64	EPK WK
H	REVISED PER TDRR 07590	4/21/64	EPK WK
J	REVISED PER TDRR 10373	6/24/64	WK
K	REVISED PER TDRR 18629	5/4/65	WK
L	REVISED PER TDRR 22281	9-8-65	
M	REVISED PER TDRR 25134	1/18/66	WK
N	REVISED PER TDRR 28635	5-17-66	

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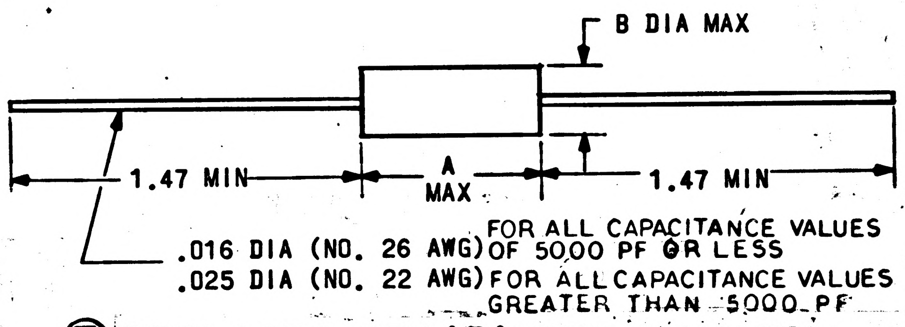
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002045 UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. PACKAGING AND PACKING: FOR DASH NUMBERS 1 THRU 32 UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH ND 1002129, FOR DASH NUMBERS 33 THRU 38 UNITS SHALL BE PACKED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - 1.) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - 2.) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - 3.) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE. HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL MEET ALL REQUIREMENTS OF MIL-C-11015 EXCEPT AS SPECIFIED HEREIN.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - 1.) DIMENSIONS PER OUTLINE AND TABLE I
     - 2.) LEAD DATA: LEADS PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 3.) MARKING: PER ND1002019, EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA PART NUMBER AND REVISION LETTER AND SERIAL NUMBER TO INDICATE COMPLETION OF BURN-IN. CAPACITANCE, CAPACITANCE TOLERANCE AND VOLTAGE RATING MAY ALSO BE MARKED ON PART. EACH CONTAINER SHALL ALSO CONTAIN THE NASA DRAWING AND DASH NUMBER TOGETHER WITH THE REVISION LETTER. MANUFACTURERS PART OR TYPE NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   - B. ELECTRICAL REQUIREMENTS:
     - 1.) CAPACITANCE: PER TABLE I AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 2.) CAPACITANCE TOLERANCE: ± 10% AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.
     - 3.) INSULATION RESISTANCE: THE PRODUCT OF MEGOHM AND MICROFARADS SHALL BE 100 MEGOHM-MICROFARADS MIN, NEED NOT EXCEED 10,000 MEGOHMS.
     - 4.) POWER FACTOR: 0.025 MAX. MEASURED AT +25°C AND 1MC/SEC ± 100 KC/SEC FOR CAPACITANCE VALUES OF 100 UUF OR LESS AND AT 1KC/SEC ± 100 CPS FOR CAPACITANCE VALUES GREATER THAN 100 UUF.

3. DESIGN REQUIREMENTS:
   - A. PER MIL-C-11015/20 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. DC WORKING VOLTAGE: 100 VOLTS AT +85°C. DERATED TO 50 VOLTS AT +125°C.
   - C. OPERATING AND STORAGE TEMPERATURE RANGE: -55°C TO +125°C WITH DERATING. ALLOWANCE SHOULD BE MADE FOR CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE AS INDICATED IN TABLE II.
   - D. LEAD STRENGTH: LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL FOR ONE MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE-WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL AXIAL POSITION, BEND THE CAPACITOR BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK TO THE STARTING POSITION. THE LEAD SHALL BE BENT AT THE POINT OF EGRESS FROM THE CAPACITOR BODY AROUND A 1/16 INCH RADIUS. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - E. ENVIRONMENTAL:
     - 1.) REDUCED PRESSURE: UNITS SHALL BE OPERATIVE DURING AND AFTER AND SHALL SUSTAIN NO DAMAGE AS A RESULT OF EXPOSURE TO 10^{-4} MM OF MERCURY FOR 96 HOURS.
     - 2.) LIFE: MAXIMUM CAPACITANCE CHANGE DURING LIFE TEST PER ND 1002045 SHALL BE ± 10%.


B DIA MAX
1.47 MIN
A MAX
1.47 MIN
.016 DIA (NO. 26 AWG) FOR ALL CAPACITANCE VALUES OF 5000 PF OR LESS
.025 DIA (NO. 22 AWG) FOR ALL CAPACITANCE VALUES GREATER THAN 5000 PF

Ⓔ REPLACES REV (D) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .005 ± .02 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO CONTRACT NAS 9-497
DRAWN G. Baxter DATE 13AUG63
CHECKED WILSON 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL 8/26/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 1 OF 2

MASTER

100165 12-12-62

N 1006777

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	THIS SHEET ADDED AND UPGRADED TO CLASS A RELEASE PER TDRR 02FF5	8/28/63	
F	REVISED PER TDRR Q396.2	10 Oct 63	WR
G	REVISED PER TDRR 06749	3/10/64	WR
H	REVISED PER TDRR 07590	4/21/64	WR
J	REVISED PER TDRR 10373	6/24/64	WR
K	REVISED PER TDRR 18629	5/4/65	WR
L	REVISED PER TDRR 22281	9/8/65	MGM
M	REVISED PER TDRR 25134	1/18/66	WR
N	REVISED PER TDRR 28635	5-17-66	

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4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 2 TIMES RATED VOLTAGE AT +85°C FOR A MINIMUM OF 100 HOURS AND A MAXIMUM OF 300 HOURS. THE LAST 48 HOURS SHALL BE FREE OF CATASTROPHIC FAILURES. (i.e. SHORTS OR OPENS)

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN.

- CAPACITANCE
- POWER FACTOR
- INSULATION RESISTANCE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN SHALL NOT BE ACCEPTABLE.

LIMITS:

CAPACITANCE: ± 5 % OF INITIAL READING

POWER FACTOR: INITIAL LIMIT

INSULATION RESISTANCE: INITIAL LIMIT

NOTES:

1. * THESE DASH NUMBERS ARE NONSTANDARD VALUES PER MIL-C-11015/20.

TABLE II
MAXIMUM CAPACITANCE CHANGE DUE TO HIGH TEMPERATURE EXPOSURE

DASH NO.	CAPACITANCE CHANGE (%) WITH EXPOSURE TO INDICATED TEMPERATURES (°C)			
	+55	+75	+85	+125
1 THRU 10	<1.0	<1.0	1.0	1.5
11 THRU 18	2.3	4.5	7.5	9.0
19 THRU 24	6.0	12.5	15.0	25.0
25 THRU 39	3.8	7.5	10.0	15.0

TABLE I

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	B
-1	10	.318	.090
* -2	20		
-3	22		
-4	33		
* -5	36		
* -6	37		
-7	47		
* -8	50		
* -9	56		
* -10	68		
* -11	75		
* -12	82		
-13	100		
* -14	130		
* -15	150		
-16	220		
* -17	270		
-18	330		
* -19	360		
-20	470		
* -21	560		
* -22	680		
* -23	820		
-24	1000	.318	.090
* -25	2000	.498	.120
-26	2200		
-27	3300		
-28	4700		
* -29	5000	.498	.120
* -30	6800	.498	.160
	UF		
-31	.010	.498	.160
* -32	.020	.498	.200
-33	.022	.698	.240
* -34	.033	.648	.240
-35	.047	.648	.240
* -36	.050	.648	.240
* -37	.068	.748	.280
-38	.100	.748	.280
-39	.015	.498	.200

DASH NO.	CAPACITANCE (UUF)	DIMENSIONS A	B
-40	5600	.498	.160
-41	8200	.498	.160

Ⓔ THIS SHEET ADDED

THE COMPLETE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT NAS 9-497

DRAWN PB Foster DATE 13AUG63
CHECKED Wilson 14 AUG 63
APPROVAL
APPROVAL Eldon C Hall 28 Aug 63
NASA APPROVAL K Michael 8/28/63
MIT APPROVAL R Hazel 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006777
SCALE NONE
WT
SHEET 2 OF 2

1006777

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NOTES:

1. THESE CAPACITORS SHALL MEET THE REQUIREMENTS OF MIL-C-11015 AND MIL-C-11015/20 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED. IN CASE OF CONFLICT BETWEEN THIS DRAWING AND REFERENCED SPECS, THIS DRAWING SHALL GOVERN.
   - A. INSULATION RESISTANCE: 100 MICROFARAD-MEGOHMS OR 10,000 MEGOHMS WHICHEVER IS LESS.
   - B. VALUES MARKED • ARE NON-STANDARD VALUES PER MIL-C-11015/20 BUT SHALL MEET ALL THE OTHER REQUIREMENTS.
   - C. COLOR CODE: SHALL BE COLOR CODED WITH BANDS OR DOTS AS SHOWN IN FIGURE TO DENOTE CAPACITANCE VALUE IN PICOFARADS.
   - D. VOLTAGE RATING: 100 VDC AT 85°C DERATED TO 50 VDC AT 125°C
   - E. LEAD MATERIAL: (DUMET) IRON-NICKEL ALLOY, COPPER CLAD, ANNEALED AND GOLD PLATED IN ACCORDANCE WITH ND PS1015401.
   - F. MARKING: CAPACITORS SHALL BE MARKED WITH MANUFACTURER'S NAME OR SYMBOL, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND NASA PART NO.
   - G. PARTS SHALL MEET ENVIRONMENTAL REQUIREMENTS OF ND 1002000.
   - H. PARTS SHALL MEET QUALITY ASSURANCE PROVISIONS OF MIL-C-11015 AND SECTION 1 OF ND 1015404.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

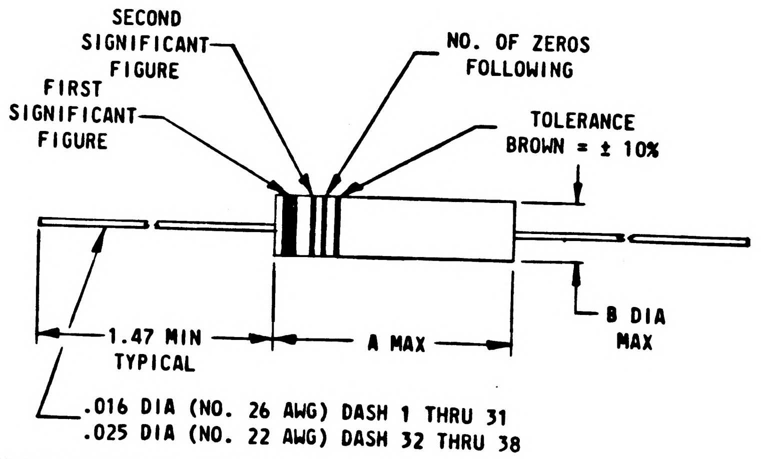
	DASH NO.	CAP PF	A	B
	-1	10	.318	.090
•	-2	20		
	-3	22		
	-4	33		
•	-5	36		
•	-6	37		
	-7	47		
•	-8	50		
•	-9	56		
•	-10	68		
•	-11	75		
•	-12	82		
	-13	100		
•	-14	130		
•	-15	150		
	-16	220		
•	-17	270		
	-18	330		
•	-19	360		
	-20	470		
•	-21	560		
•	-22	680		
•	-23	820	↓	↓
	-24	1000	.318	.090
•	-25	2000	.498	.120
	-26	2200		
	-27	3300		
	-28	4700	↓	↓
•	-29	5000	.498	.120
•	-30	6800	.498	.160
		MF		
	-31	.010	.498	.160
•	-32	.020	.498	.200
	-33	.022	.648	.240
•	-34	.033	.648	.240
	-35	.047	.648	.240
•	-36	.050	.648	.240
•	-37	.068	.748	.280
	-38	.100	.748	.280

SYM	DESCRIPTION	DATE	APPROVAL

REVISIONS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62



UNLESS SPECIFIED, STANDARD COLOR CODE BLACK = 0 THRU WHITE = 9

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

FOR SOURCE OF SUPPLY:

SEE QUALIFIED VENDOR LIST

ND ______________

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. WHEELER DATE 21 NOV 62
CHECKED D. M. SLEEPER 27 NOV 62
APPROVAL E C Hall 11 Dec 62
APPROVAL ______________
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
CERAMIC DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006777

SCALE NONE WT SHEET 1 OF 1

1006777

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1006778

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		
A	ADDED PROCUREMENT NOTE 3 PER TDRR 00433	2-20-63	WB WK

NOTES:

1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) CURRENT PULSE (Im):
       - (a) AT 25°C: 800 MILLIAMPERES
       - (b) AT 0°C: 837 MILLIAMPERES
       - (c) AT 100°C: 652 MILLIAMPERES
     - (2) PARTIAL CURRENT PULSE (Id):
       - (a) AT 25°C: 510 MILLIAMPERES
       - (b) AT 0°C: 527 MILLIAMPERES
       - (c) AT 100°C: 410 MILLIAMPERES
     - (3) SELECTED UNDISTURBED ONE VOLTAGE OUTPUT (uV_1):
       - (a) AT 25°C: FROM 60 TO 75 MILLIVOLTS.
       - (b) AT 0°C: FROM 65 TO 85 MILLIVOLTS.
       - (c) AT 100°C: GREATER THAN OR EQUAL TO 35 MILLIVOLTS.
     - (4) SELECTED DISTURBED ZERO VOLTAGE OUTPUT (dVz):
       - (a) AT 25°C, 0°C AND 100°C: LESS THAN OR EQUAL TO 8 MILLIVOLTS.
     - (5) RISE TIME (Tr):
       - (a) AT 25°C, 0°C AND 100°C: 0.5 MICROSECOND.
     - (6) PULSE DURATION (Td):
       - (a) AT 25°C, 0°C AND 100°C: 4.0 MICROSECONDS (FROM 50% ON THE RISE TO 50% ON THE FALL OF THE PEAK AMPLITUDE OF THE CURRENT PULSE).
     - (7) PEAKING TIME (Tp):
       - (a) AT 25°C, 0°C AND 100°C: 0.70 PLUS OR MINUS 0.05 MICROSECOND.
     - (8) SWITCHING TIME (Ts):
       - (a) AT 25°C AND 0°C: LESS THAN OR EQUAL TO 1.25 MICROSECONDS.
       - (b) AT 100°C: LESS THAN OR EQUAL TO 1.6 MICROSECONDS.
   - B. UNITS SHALL BE CAPABLE OF WITHSTANDING THE ENVIRONMENTAL TESTS SPECIFIED IN NASA DOCUMENT ND 1002000.
   - C. QUALITY ASSURANCE PROVISIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE REQUIREMENTS OF NASA DOCUMENT PS 1015404, SECTION
     - (2) ACCEPTANCE INSPECTION:
       - (a) CORES SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS 100 PERCENT AT 25°C. A 1 PERCENT SAMPLE SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS AT 0°C AND 100°C.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

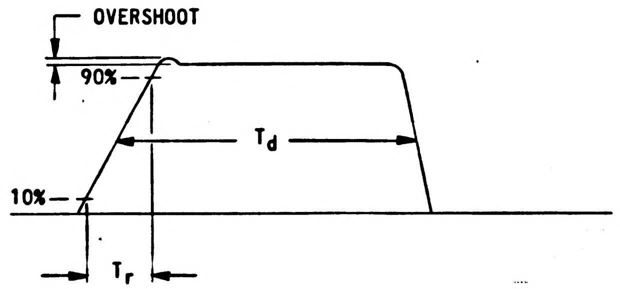


FIG. 1 CURRENT PULSE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

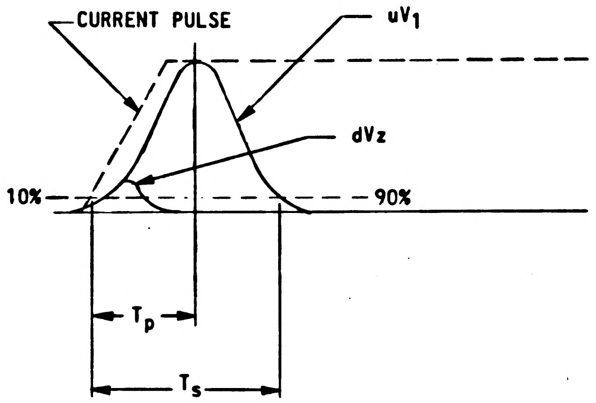
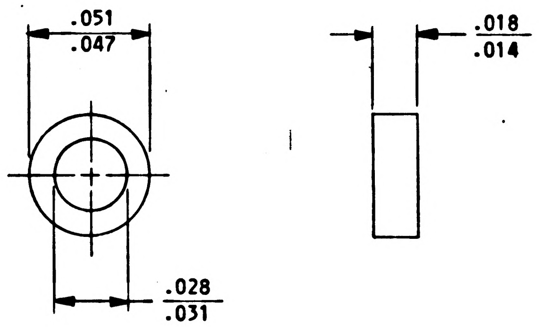


FIG. 2 VOLTAGE RESPONSE OF CORE



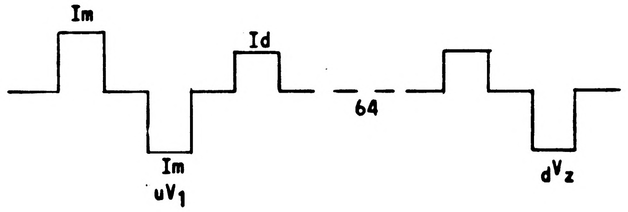


FIG. 3 CURRENT PULSE SEQUENCE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

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DRAWN DATE 28 Nov 62
CHECKED H Maynard 3 DEC 62
APPROVAL Eldon C Hall 12 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL 12/14/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MAGNETIC CORE, FERRITE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006778

SCALE NONE WT SHEET 1 OF 1

1006778 B

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		
Ⓜ A	ADDED PROCUREMENT NOTE 3 PER TDRR 00433	2-20-63	HB WK
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513		WK

NOTES:

1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) CURRENT PULSE (Im):
       - (a) AT 25°C: 800 MILLIAMPERES
       - (b) AT 0°C: 837 MILLIAMPERES
       - (c) AT 100°C: 652 MILLIAMPERES
     - (2) PARTIAL CURRENT PULSE (Id):
       - (a) AT 25°C: 510 MILLIAMPERES
       - (b) AT 0°C: 527 MILLIAMPERES
       - (c) AT 100°C: 410 MILLIAMPERES
     - (3) SELECTED UNDISTURBED ONE VOLTAGE OUTPUT (uV_1):
       - (a) AT 25°C: FROM 60 TO 75 MILLIVOLTS.
       - (b) AT 0°C: FROM 65 TO 85 MILLIVOLTS.
       - (c) AT 100°C: GREATER THAN OR EQUAL TO 35 MILLIVOLTS.
     - (4) SELECTED DISTURBED ZERO VOLTAGE OUTPUT (dVz):
       - (a) AT 25°C, 0°C AND 100°C: LESS THAN OR EQUAL TO 8 MILLIVOLTS.
     - (5) RISE TIME (Tr):
       - (a) AT 25°C, 0°C AND 100°C: 0.5 MICROSECOND.
     - (6) PULSE DURATION (Td):
       - (a) AT 25°C, 0°C AND 100°C: 4.0 MICROSECONDS (FROM 50% ON THE RISE TO 50% ON THE FALL OF THE PEAK AMPLITUDE OF THE CURRENT PULSE).
     - (7) PEAKING TIME (Tp):
       - (a) AT 25°C, 0°C AND 100°C: 0.70 PLUS OR MINUS 0.05 MICROSECOND.
     - (8) SWITCHING TIME (Ts):
       - (a) AT 25°C AND 0°C: LESS THAN OR EQUAL TO 1.25 MICROSECONDS.
       - (b) AT 100°C: LESS THAN OR EQUAL TO 1.6 MICROSECONDS.
   - B. UNITS SHALL BE CAPABLE OF WITHSTANDING THE ENVIRONMENTAL TESTS SPECIFIED IN NASA DOCUMENT ND 1002000.
   - C. QUALITY ASSURANCE PROVISIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE REQUIREMENTS OF NASA DOCUMENT PS 1015404, SECTION
     - (2) ACCEPTANCE INSPECTION:
       - (a) CORES SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS 100 PERCENT AT 25°C. A 1 PERCENT SAMPLE SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS AT 0°C AND 100°C.
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   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

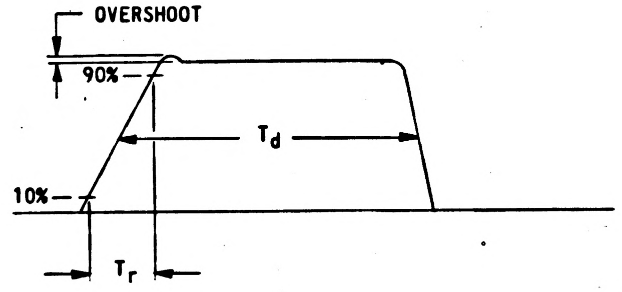


FIG. 1 CURRENT PULSE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62

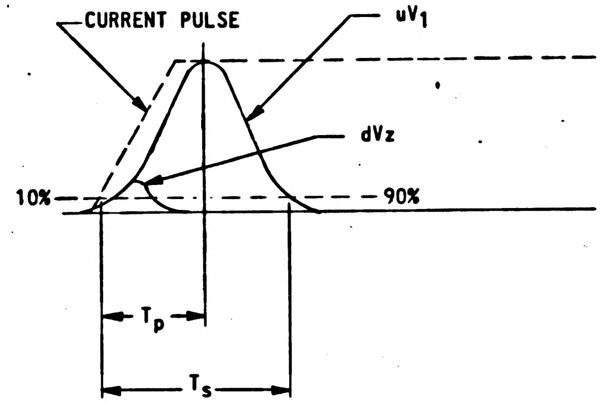
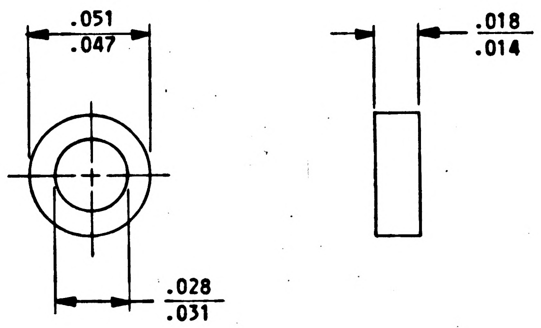


FIG. 2 VOLTAGE RESPONSE OF CORE



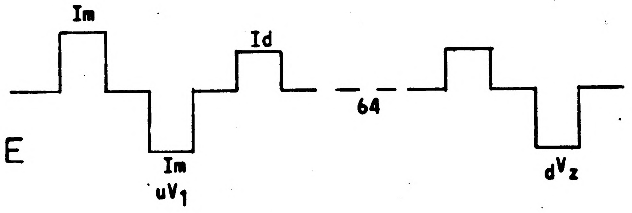


FIG. 3 CURRENT PULSE SEQUENCE

Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY | USED ON

APPLICATION

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

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DRAWN Ray W Beebe DATE 28 Nov 62
CHECKED H Maynard 3 DEC 62
APPROVAL Ellen C Hall 12 Dec 62
APPROVAL

NASA APPROVAL W J Rhine 12-12-62

MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MAGNETIC CORE, FERRITE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006778

SCALE NONE | WT | SHEET 1 OF 1

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1006778

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		

NOTES:

1. REQUIREMENTS:
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   - B. UNITS SHALL BE CAPABLE OF WITHSTANDING THE ENVIRONMENTAL TESTS SPECIFIED IN NASA DOCUMENT ND 1002000.
   - C. QUALITY ASSURANCE PROVISIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE REQUIREMENTS OF NASA DOCUMENT PS 1015404, SECTION
     - (2) ACCEPTANCE INSPECTION:
       - (a) CORES SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS 100 PERCENT AT 25°C. A 1 PERCENT SAMPLE SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS AT 0°C AND 100°C.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

APPROVED SOURCE OF SUPPLY:

PER QUALIFIED VENDOR LIST
SEE ND

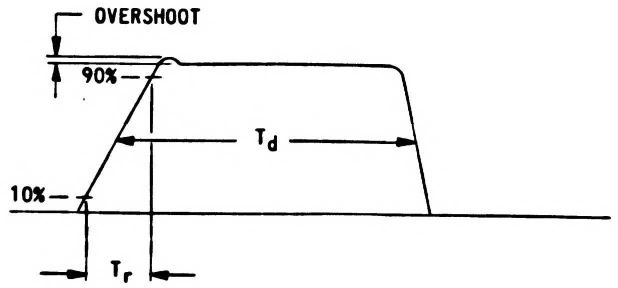

FIG. 1 CURRENT PULSE

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CLASS B RELEASE TDR No. 00165 DATE 12/12/62

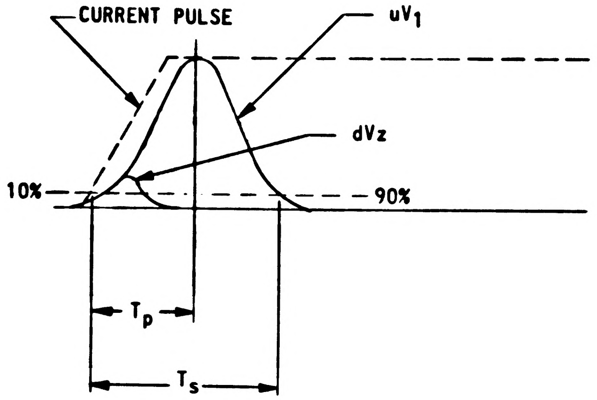
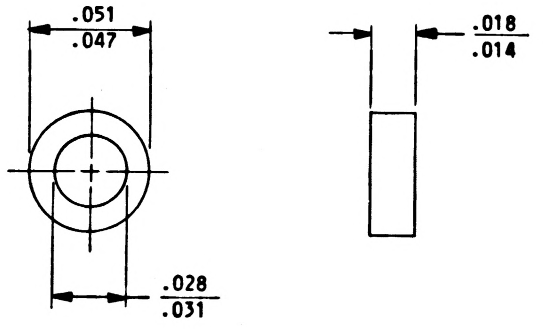


FIG. 2 VOLTAGE RESPONSE OF CORE



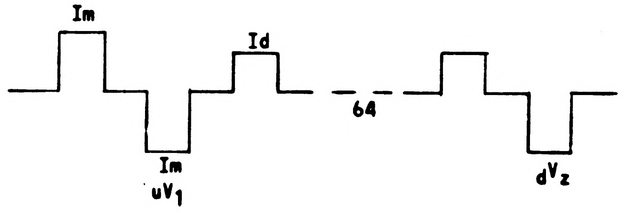


FIG. 3 CURRENT PULSE SEQUENCE

1006778

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
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DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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CAMBRIDGE, MASS.
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DRAWN Ray Wheeler DATE 28 Nov 62
CHECKED H Maynard 3 DEC 62
APPROVAL Ellen C Hall 12 Dec 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/13/6

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MAGNETIC CORE, FERRITE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006778
SCALE NONE
WT
SHEET 1 OF 1

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1006779 (M)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 3 PER TDRR 00433	2-20-63	WR

NOTES:

1. THE COILS COVERED BY THIS DRAWING SHALL BE IN ACCORDANCE WITH MIL-C-15305, GRADE 2, CLASS B WITH THE FOLLOWING EXCEPTIONS, ADDITIONS AND PARTICULAR VALUES. IN CASE OF CONFLICT BETWEEN DOCUMENTS, THE ORDER OF PRECEDENCE SHALL BE (1) THIS DRAWING, (2) REFERENCED NASA DOCUMENTS, (3) REFERENCED MILITARY AND FEDERAL DOCUMENTS, AND (4) OTHER REFERENCED DOCUMENTS.
   - A. ELECTRICAL CHARACTERISTICS: SEE TABLE I.
   - B. DC WORKING VOLTAGE, AT 125°C AND 0.33 WATTS = DC RESISTANCE MAX TIMES CURRENT MAX.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 100 VDC.
   - D. LEAD MATERIAL: WELDABLE AND SOLDERABLE FLEXIBLE GOLD PLATED SOLID KOVAR LEADS IN ACCORDANCE WITH ND PS1015402. A CERTIFICATE OF COMPLIANCE MUST ACCOMPANY EACH LOT SHIPPED.
   - E. ENVIRONMENTAL CONDITIONS: THE SEVEREST CONDITIONS OF MIL-C-15305 AND ND 1002000 SHALL BE MET.
   - F. QUALITY ASSURANCE: THE PROVISIONS OF MIL-C-15305 AND SECTION I OF ND 1015404 SHALL BE MET.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

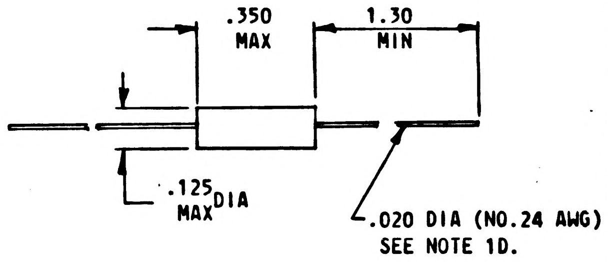
TABLE I

DASH NO	L	Q MIN		APPROX FO	APPROX CD	MIN RP		MIN RP		MAX RES	MAX I	INCR* I	NYTRONICS PART NO.
	UH		MC	MC	UUF	K	MC	K	MC	OHMS	mA	mA	WEE-WEE -
-1	0.47	41	25	309	0.57	18	75	31	230	.360	960	960	0.47
-2	0.56	39	25	295	0.52	19	75	36	230	.397	915	915	0.56
-3	0.68	36	25	270	0.52	20	75	39	230	.472	840	840	0.68
-4	0.82	35	25	250	0.52	25	75	41	230	.638	720	720	0.82
-5	1.0	42	25	170	0.87	14	75	11	170	.208	1260	1260	1.0
-6	1.2	38	7.9	150	0.94	13	50	13	150	.225	1210	1210	1.2
-7	1.5	38	7.9	139	0.87	16	50	14	139	.265	1120	1120	1.5
-8	1.8	38	7.9	129	0.85	18	50	16	129	.285	1080	1080	1.8
-9	2.2	36	7.9	118	0.83	20	40	22	118	.330	1000	1000	2.2
-10	2.7	38	7.9	106	0.83	24	40	23	106	.381	935	935	2.7
-11	3.3	38	7.9	98	0.81	27	30	28	98	.432	875	875	3.3
-12	3.9	40	7.9	91	0.79	29	30	29	91	.576	755	755	3.9
-13	4.7	42	7.9	83	0.79	26	25	32	83	.787	650	650	4.7
-14	5.6	42	7.9	77	0.79	31	25	33	77	1.04	565	565	5.6
-15	6.8	45	7.9	67	0.83	28	20	37	67	1.40	485	485	6.8
-16	8.2	47	7.9	62	0.81	29	20	38	62	1.68	440	440	8.2
-17	10	51	7.9	55	0.83	38	20	39	55	2.58	355	355	10
-18	12	51	2.5	49	0.88	42	15	40	49	3.65	300	300	12
-19	15	45	2.5	55	0.56	9	15	9	55	.862	620	200	15
-20	18	43	2.5	50	0.57	10	15	10	50	1.02	570	175	18
-21	22	42	2.5	45	0.57	16	10	11	45	1.12	545	160	22
-22	27	37	2.5	41	0.58	17	10	13	41	1.28	510	155	27
-23	33	46	2.5	37	0.57	22	10	15	37	1.70	440	150	33
-24	39	38	2.5	33	0.59	27	5	18	33	1.99	405	145	39
-25	47	42	2.5	29	0.64	34	5	21	29	2.41	370	140	47
-26	56	41	2.5	27	0.54	37	5	24	27	2.85	340	130	56
-27	68	46	2.5	23	0.71	57	5	31	23	3.21	320	120	68
-28	82	46	2.5	21	0.71	62	4	33	21	3.57	305	115	82
-29	100	43	2.5	19	0.71	68	4	47	19	4.10	280	100	100

*INCREMENTAL INDUCTANCE CURRENT REQUIRED FOR A REDUCTION OF 5% IN INDUCTANCE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62



1006779

MASTER

ORIGINAL SOURCE OF SUPPLY:

NYTRONICS, INC.
550 SPRINGFIELD AVE
BERKELEY HTS, N. J.
CODE IDENT NO. 72259

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN D.M. Slaper DATE 3 DEC 62
CHECKED D.M. Slaper 4 DEC 62
APPROVAL E C Hall 11 DEC 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, RF, SUB MINIATURE

SPECIFICATIONS CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006779
SCALE NONE
WT
SHEET 1 OF 1

B 1006779

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	ADDED PROCUREMENT NOTE 3 PER TDRR 00433	2-20-63	4/8 WK
B	REPLACE WITH CHANGE BY REV C PER TDRR 00513		WK

NOTES:

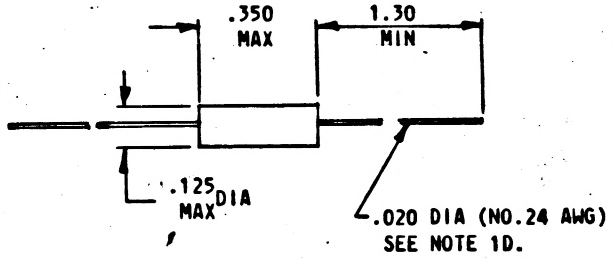
1. THE COILS COVERED BY THIS DRAWING SHALL BE IN ACCORDANCE WITH MIL-C-15305, GRADE 2, CLASS B WITH THE FOLLOWING EXCEPTIONS, ADDITIONS AND PARTICULAR VALUES. IN CASE OF CONFLICT BETWEEN DOCUMENTS, THE ORDER OF PRECEDENCE SHALL BE (1) THIS DRAWING, (2) REFERENCED NASA DOCUMENTS, (3) REFERENCED MILITARY AND FEDERAL DOCUMENTS, AND (4) OTHER REFERENCED DOCUMENTS.
   - A. ELECTRICAL CHARACTERISTICS: SEE TABLE I.
   - B. DC WORKING VOLTAGE, AT 125°C AND 0.33 WATTS = DC RESISTANCE MAX TIMES CURRENT MAX.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 100 VDC.
   - D. LEAD MATERIAL: WELDABLE AND SOLDERABLE FLEXIBLE GOLD PLATED SOLID KOVAR LEADS IN ACCORDANCE WITH ND PS1015402. A CERTIFICATE OF COMPLIANCE MUST ACCOMPANY EACH LOT SHIPPED.
   - E. ENVIRONMENTAL CONDITIONS: THE SEVEREST CONDITIONS OF MIL-C-15305 AND ND 1002000 SHALL BE MET.
   - F. QUALITY ASSURANCE: THE PROVISIONS OF MIL-C-15305 AND SECTION I OF ND 1015404 SHALL BE MET.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

TABLE I

DASH NO	L	Q MIN		APPROX FO	APPROX CD	MIN RP		MIN RP		MAX RES	MAX I	INCR* I	NYTRONICS PART NO.
	UH		MC	MC	UUF	K	MC	K	MC	OHMS	mA	mA	WEE-WEE -
-1	0.47	41	25	309	0.57	18	75	31	230	.360	960	960	0.47
-2	0.56	39	25	295	0.52	19	75	36	230	.397	915	915	0.56
-3	0.68	36	25	270	0.52	20	75	39	230	.472	840	840	0.68
-4	0.82	35	25	250	0.52	25	75	41	230	.638	720	720	0.82
-5	1.0	42	25	170	0.87	14	75	11	170	.208	1260	1260	1.0
-6	1.2	38	7.9	150	0.94	13	50	13	150	.225	1210	1210	1.2
-7	1.5	38	7.9	139	0.87	16	50	14	139	.265	1120	1120	1.5
-8	1.8	38	7.9	129	0.85	18	50	16	129	.285	1080	1080	1.8
-9	2.2	36	7.9	118	0.83	20	40	22	118	.330	1000	1000	2.2
-10	2.7	38	7.9	106	0.83	24	40	23	106	.381	935	935	2.7
-11	3.3	38	7.9	98	0.81	27	30	28	98	.432	875	875	3.3
-12	3.9	40	7.9	91	0.79	29	30	29	91	.576	755	755	3.9
-13	4.7	42	7.9	83	0.79	26	25	32	83	.787	650	650	4.7
-14	5.6	42	7.9	77	0.79	31	25	33	77	1.04	565	565	5.6
-15	6.8	45	7.9	67	0.83	28	20	37	67	1.40	485	485	6.8
-16	8.2	47	7.9	62	0.81	29	20	38	62	1.68	440	440	8.2
-17	10	51	7.9	55	0.83	38	20	39	55	2.58	355	355	10
-18	12	51	2.5	49	0.88	42	15	40	49	3.65	300	300	12
-19	15	45	2.5	55	0.56	9	15	9	55	.862	620	200	15
-20	18	43	2.5	50	0.57	10	15	10	50	1.02	570	175	18
-21	22	42	2.5	45	0.57	16	10	11	45	1.12	545	160	22
-22	27	37	2.5	41	0.58	17	10	13	41	1.28	510	155	27
-23	33	46	2.5	37	0.57	22	10	15	37	1.70	440	150	33
-24	39	38	2.5	33	0.59	27	5	18	33	1.99	405	145	39
-25	47	42	2.5	29	0.64	34	5	21	29	2.41	370	140	47
-26	56	41	2.5	27	0.54	37	5	24	27	2.85	340	130	56
-27	68	46	2.5	23	0.71	57	5	31	23	3.21	320	120	68
-28	82	46	2.5	21	0.71	62	4	33	21	3.57	305	115	82
-29	100	43	2.5	19	0.71	68	4	47	19	4.10	280	100	100

*INCREMENTAL INDUCTANCE CURRENT REQUIRED FOR A REDUCTION OF 5% IN INDUCTANCE.

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00165 DATE 12/12/62



Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

ORIGINAL SOURCE OF SUPPLY:

NYTRONICS, INC.
550 SPRINGFIELD AVE
BERKELEY HTS, N. J.
CODE IDENT NO. 72259

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D M Slaper DATE 3 DEC 62
CHECKED D M Slaper 4 DEC 62
APPROVAL E C Hall 11 DEC 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, RF, SUB MINIATURE

SPECIFICATIONS CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006779
SCALE NONE
WT
SHEET 1 OF 1

1006779 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006779

NOTES:

1. THE COILS COVERED BY THIS DRAWING SHALL BE IN ACCORDANCE WITH MIL-C-15305, GRADE 2, CLASS B WITH THE FOLLOWING EXCEPTIONS, ADDITIONS AND PARTICULAR VALUES. IN CASE OF CONFLICT BETWEEN DOCUMENTS, THE ORDER OF PRECEDENCE SHALL BE (1) THIS DRAWING, (2) REFERENCED NASA DOCUMENTS, (3) REFERENCED MILITARY AND FEDERAL DOCUMENTS, AND (4) OTHER REFERENCED DOCUMENTS.
   - A. ELECTRICAL CHARACTERISTICS: SEE TABLE I.
   - B. DC WORKING VOLTAGE, AT 125°C AND 0.33 WATTS = DC RESISTANCE MAX TIMES CURRENT MAX.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 100 VDC.
   - D. LEAD MATERIAL: WELDABLE AND SOLDERABLE FLEXIBLE GOLD PLATED SOLID KOVAR LEADS IN ACCORDANCE WITH ND PS1015402. A CERTIFICATE OF COMPLIANCE MUST ACCOMPANY EACH LOT SHIPPED.
   - E. ENVIRONMENTAL CONDITIONS: THE SEVEREST CONDITIONS OF MIL-C-15305 AND ND 1002000 SHALL BE MET.
   - F. QUALITY ASSURANCE: THE PROVISIONS OF MIL-C-15305 AND SECTION I OF ND 1015404 SHALL BE MET.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

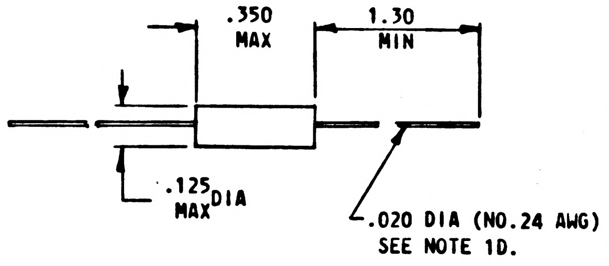
DASH NO	L	Q MIN		APPROX FO	APPROX CD	MIN RP		MIN RP		MAX RES	MAX I	INCR* I	NYTRONICS PART NO.
	UH		MC	MC	UUF	K	MC	K	MC	OHMS	mA	mA	WEE-WEE -
-1	0.47	41	25	309	0.57	18	75	31	230	.360	960	960	0.47
-2	0.56	39	25	295	0.52	19	75	36	230	.397	915	915	0.56
-3	0.68	36	25	270	0.52	20	75	39	230	.472	840	840	0.68
-4	0.82	35	25	250	0.52	25	75	41	230	.638	720	720	0.82
-5	1.0	42	25	170	0.87	14	75	11	170	.208	1260	1260	1.0
-6	1.2	38	7.9	150	0.94	13	50	13	150	.225	1210	1210	1.2
-7	1.5	38	7.9	139	0.87	16	50	14	139	.265	1120	1120	1.5
-8	1.8	38	7.9	129	0.85	18	50	16	129	.285	1080	1080	1.8
-9	2.2	36	7.9	118	0.83	20	40	22	118	.330	1000	1000	2.2
-10	2.7	38	7.9	106	0.83	24	40	23	106	.381	935	935	2.7
-11	3.3	38	7.9	98	0.81	27	30	28	98	.432	875	875	3.3
-12	3.9	40	7.9	91	0.79	29	30	29	91	.576	755	755	3.9
-13	4.7	42	7.9	83	0.79	26	25	32	83	.787	650	650	4.7
-14	5.6	42	7.9	77	0.79	31	25	33	77	1.04	565	565	5.6
-15	6.8	45	7.9	67	0.83	28	20	37	67	1.40	485	485	6.8
-16	8.2	47	7.9	62	0.81	29	20	38	62	1.68	440	440	8.2
-17	10	51	7.9	55	0.83	38	20	39	55	2.58	355	355	10
-18	12	51	2.5	49	0.88	42	15	40	49	3.65	300	300	12
-19	15	45	2.5	55	0.56	9	15	9	55	.862	620	200	15
-20	18	43	2.5	50	0.57	10	15	10	50	1.02	570	175	18
-21	22	42	2.5	45	0.57	16	10	11	45	1.12	545	160	22
-22	27	37	2.5	41	0.58	17	10	13	41	1.28	510	155	27
-23	33	46	2.5	37	0.57	22	10	15	37	1.70	440	150	33
-24	39	38	2.5	33	0.59	27	5	18	33	1.99	405	145	39
-25	47	42	2.5	29	0.64	34	5	21	29	2.41	370	140	47
-26	56	41	2.5	27	0.54	37	5	24	27	2.85	340	130	56
-27	68	46	2.5	23	0.71	57	5	31	23	3.21	320	120	68
-28	82	46	2.5	21	0.71	62	4	33	21	3.57	305	115	82
-29	100	43	2.5	19	0.71	68	4	47	19	4.10	280	100	100

*INCREMENTAL INDUCTANCE CURRENT REQUIRED FOR A REDUCTION OF 5% IN INDUCTANCE.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00165 DATE 12/12/62



1006779

ORIGINAL SOURCE OF SUPPLY:

NYTRONICS, INC.
550 SPRINGFIELD AVE
BERKELEY HTS, N. J.
CODE IDENT NO. 72259

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D.M. Slaper DATE 5 DEC 62
CHECKED D.M. Slaper 4 DEC 62
APPROVAL E C Hall 11 DEC 62
APPROVAL
NASA APPROVAL W J Rhine 12-12-62
MIT APPROVAL 12/12/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, RF, SUB MINIATURE

SPECIFICATIONS CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006779
SCALE NONE WT SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

A 1006781

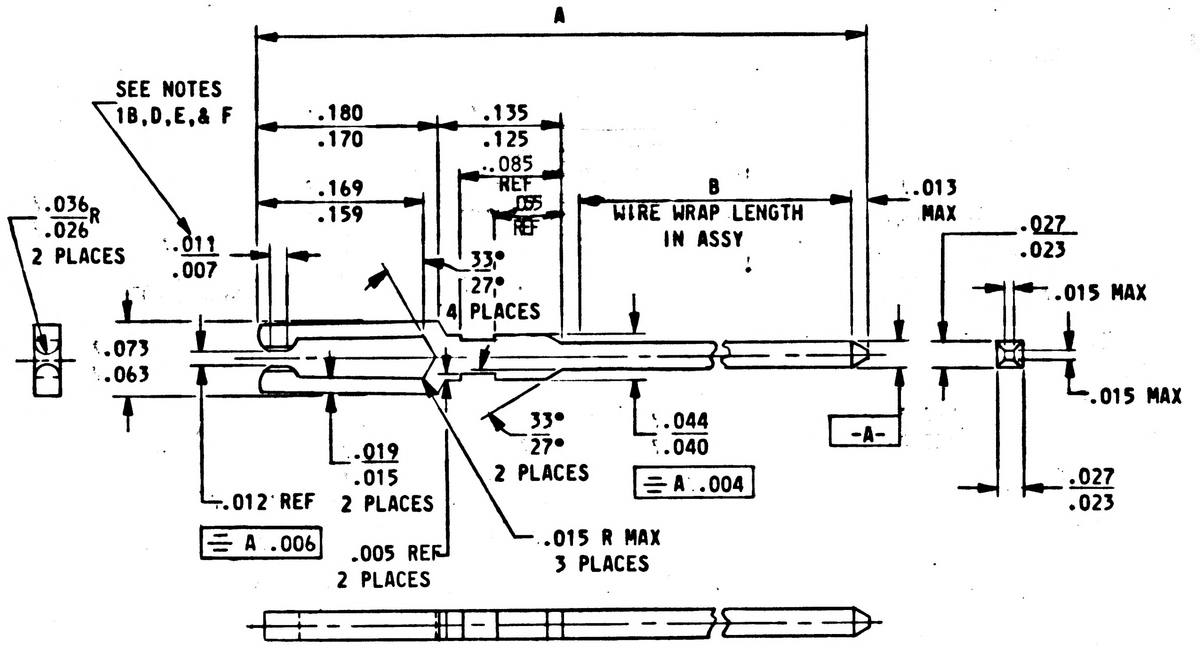
REVISIONS TORR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		
A	REVISED PER TDRR 03036	10 Sep 63	WH

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER QQ-C-533.
   - B. FINISH: GOLD PLATE, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 36C MINIMUM.
   - D. SURFACE QUALITY: $^{50}\surd$ PER STANDARD MIL-STD-10 AT CONTACT AREA.
   - E. INSERTION: 10 OUNCES MAXIMUM.
   - F. RETENTION: 3 OUNCES MINIMUM.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DASH NO.	DIMENSIONS A	DIMENSIONS B	MALCO PART NUMBER
1	.515 .511	.177 .173	
2	.690 .686	.352 .348	
3	.840 .836	.502 .498	5190002



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Martin
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006781

SCALE NONE | WT | SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B 1006781

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

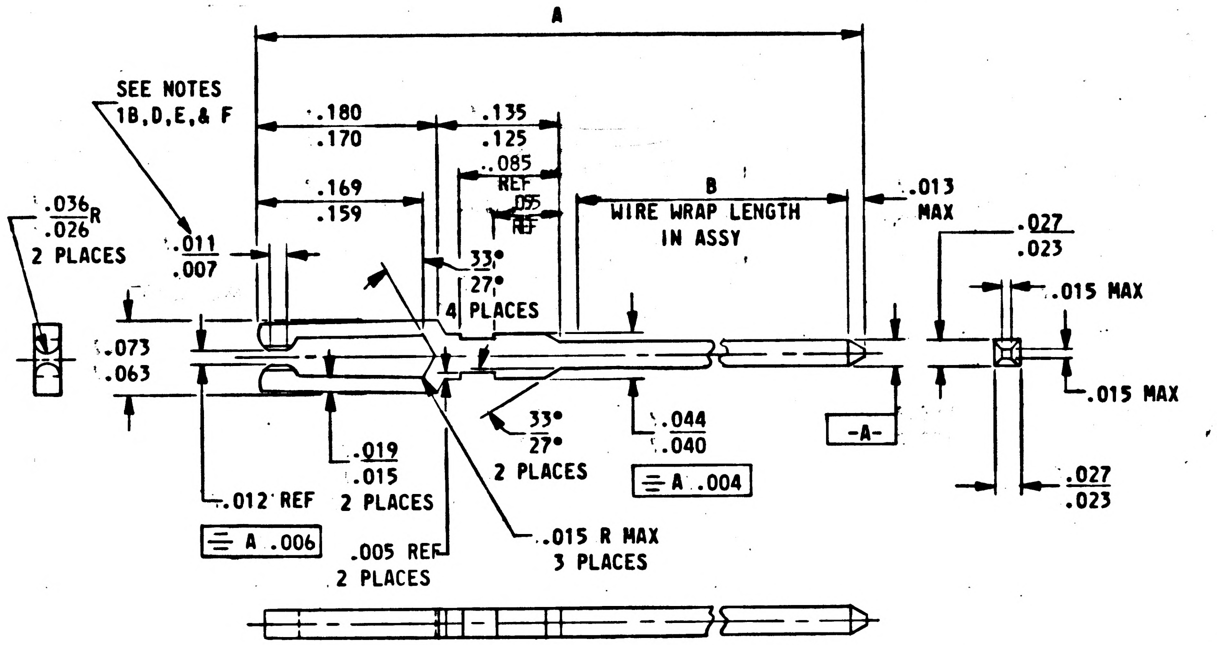
REVISIONS TDRR 00189 12.20.62

SYM	DESCRIPTION	DATE	APPROVAL
(M)	ORIGINATED		
(N) A	REVISED PER TDRR 03036	10 Sep 63	WH
B	REVISED PER TDRR 04004	17 Oct 63	WK

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER QQ-C-533.
   - B. FINISH: GOLD PLATE, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 36C MINIMUM.
   - D. SURFACE QUALITY: $\overset{50}{\checkmark}$ PER STANDARD MIL-STD-10 AT CONTACT AREA.
   - E. INSERTION: 10 OUNCES MAXIMUM.
   - F. RETENTION: 3 OUNCES MINIMUM.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DASH NO.	DIMENSIONS		MALCO PART NUMBER
	A	B	
1	.515 .511	.177 .173	
2	.690 .686	.352 .348	
3	.840 .836	.502 .498	5190002
4	.665 .661	.327 .323	



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray W Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL W Hoffer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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C 1006781

	REVISIONS TORR 00189 12.20.62		
SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		
A	REVISED PER TDRR 03036	10 Apr 63	WH
B	REVISED PER TDRR 04004	17 Oct 63	WK
C	REVISED PER TDRR 06704	3/10/64	WK

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER QQ-C-533.
   - B. FINISH: GOLD PLATE, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 59-30N SCALE.
   - D. SURFACE QUALITY: 50√ PER STANDARD MIL-STD-10 AT CONTACT AREA.
   - E. INSERTION: 10 OUNCES MAXIMUM.
   - F. RETENTION: 3 OUNCES MINIMUM.
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     - (3) SUPPLIERS LOT NUMBER & DATE OF MANUFACTURE
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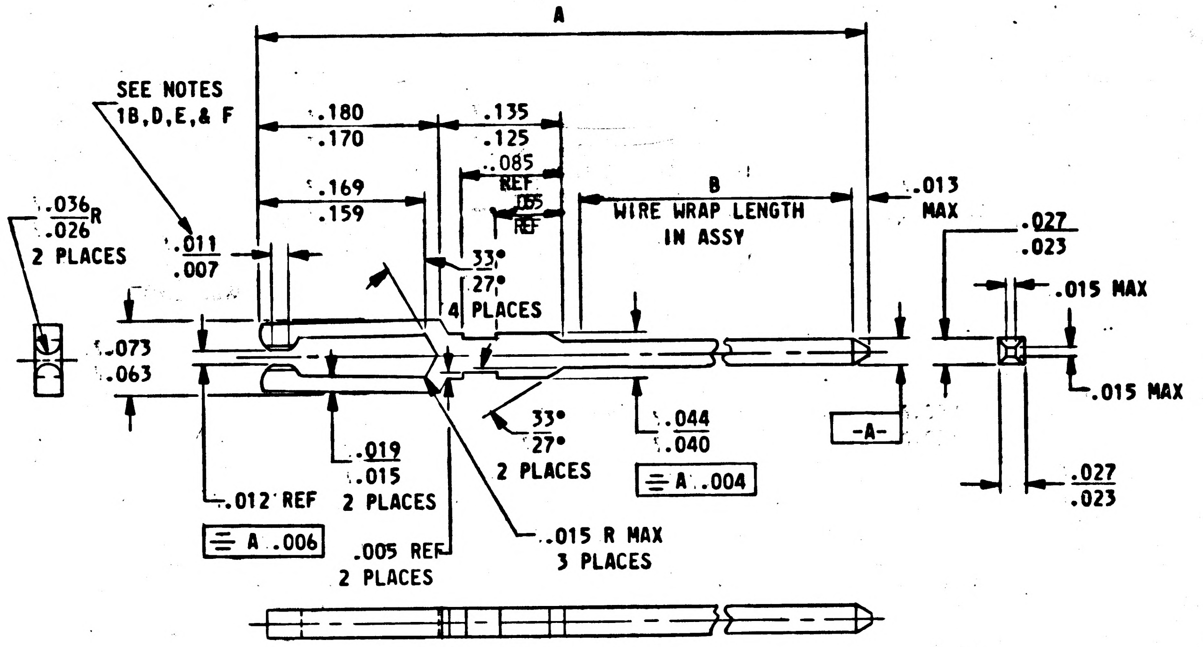

DASH NO.	DIMENSIONS		MALCO PART NUMBER
	A	B REF	
1	.518 .508	.175	
2	.693 .683	.350	
3	.843 .833	.500	5190002
4	.668 .658	.325	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan

NASA APPROVAL W J Rhine 12-20-62

MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST, FEMALE, MINIATURE SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006781
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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D 1006781

REVISIONS TDRR 00189 12.20.62

SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		
A	REVISED PER TDRR 03036	10 Sep 63	WK
B	REVISED PER TDRR 04004	17 Oct 63	WK
C	REVISED PER TDRR 06704	3/10/64	WK
D	REVISED PER TDRR 11328	4 Aug 64	WK

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER QQ-C-533.
   - B. FINISH: GOLD PLATE, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 59-30N SCALE.
   - D. SURFACE QUALITY: 50√ PER STANDARD MIL-STD-10 AT CONTACT AREA.
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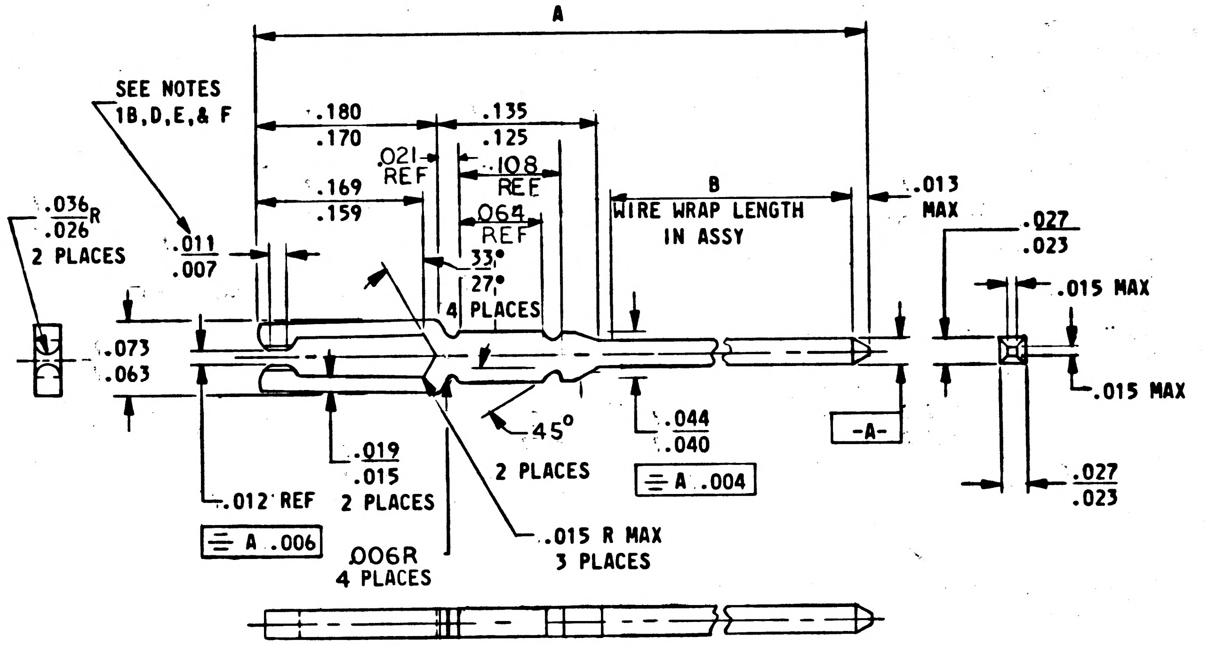

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FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Marton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL W Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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E 1006781

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D	REVISED PER TDRR 11328	4 Jun 64	WK
E	REVISED PER TDRR 13666	4 [illegible] 64	WK

NOTES:

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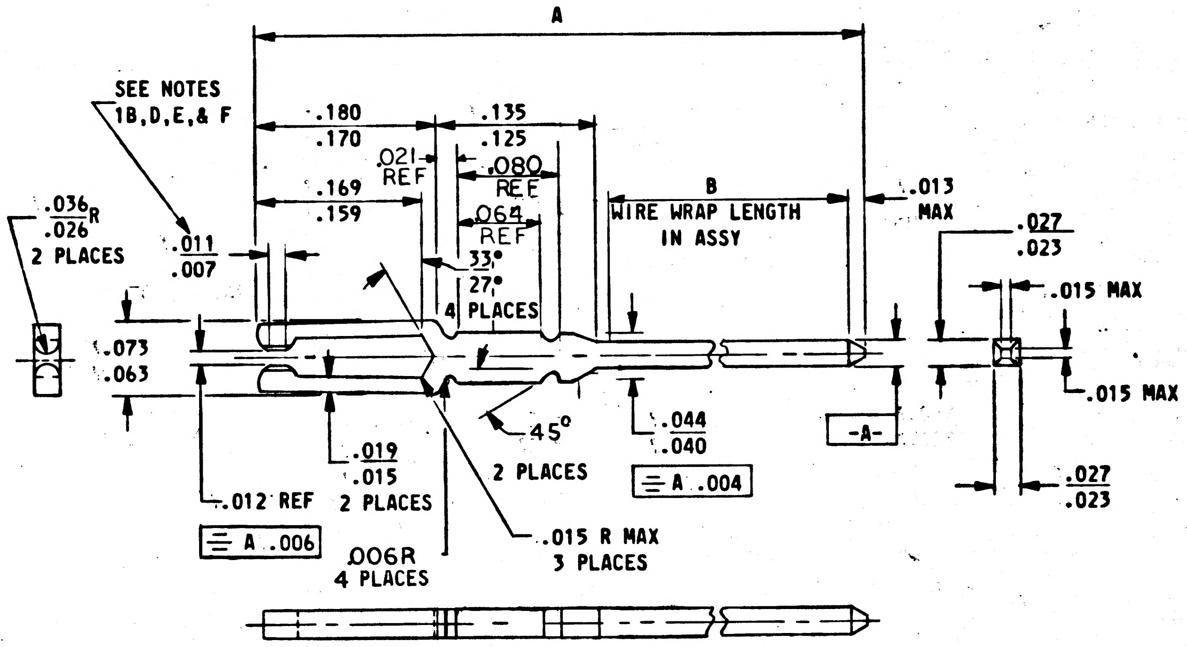

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
D. NO. CONTRACT
DRAWN Ray Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL W Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F	1006781

REVISIONS TDRR 00189 12.20.62

SYM	DESCRIPTION	DATE	APPROVAL
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D	REVISED PER TDRR 11328	4 Jun 64	WH
E	REVISED PER TDRR 13666	[illegible]	WH
F	REVISED PER TDRR 18750	5/11/65	WH

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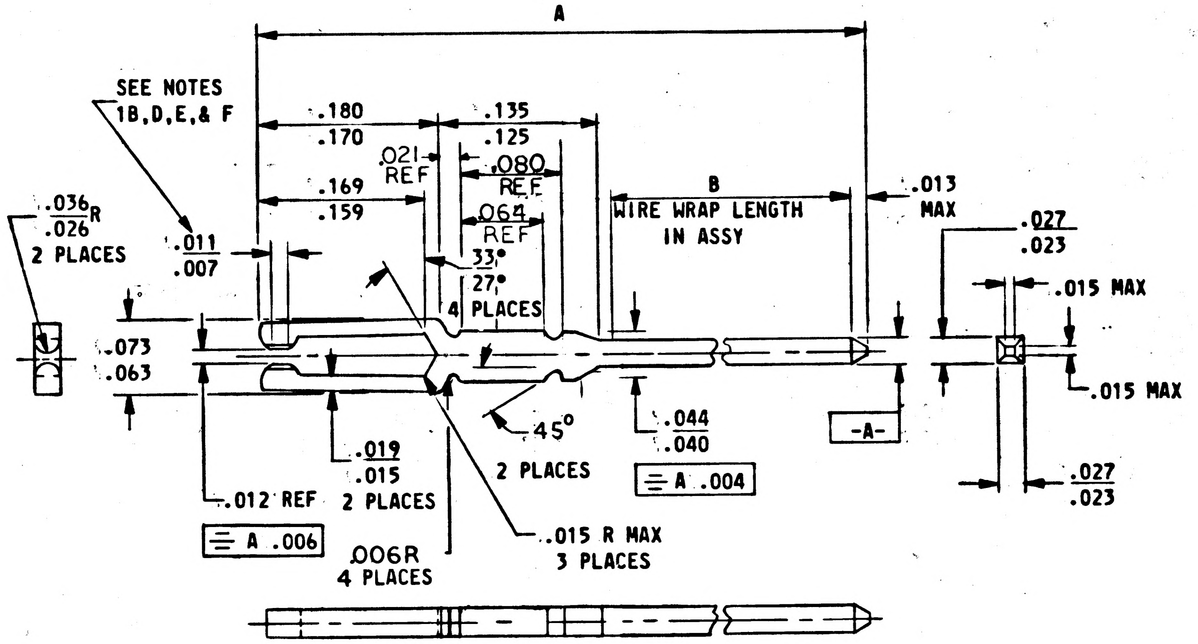

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3	.843 .833	.500
4	.668 .658	.325
5	2.590 2.580	2.247
6	2.473 2.463	2.130

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HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
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DWG. NO. CONTRACT
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APPROVAL Joe Morton
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

MASTER

G 1006781

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS TDRR 00189 12.20.62		
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C	REVISED PER TDRR 06704	3/10/64	WK
D	REVISED PER TDRR 11328	4 Aug 64	WK
E	REVISED PER TDRR 13666	[illegible]	WK
F	REVISED PER TDRR 18750	5/11/65	WK
G	REVISED PER TDRR 24029	11/23/65	WK

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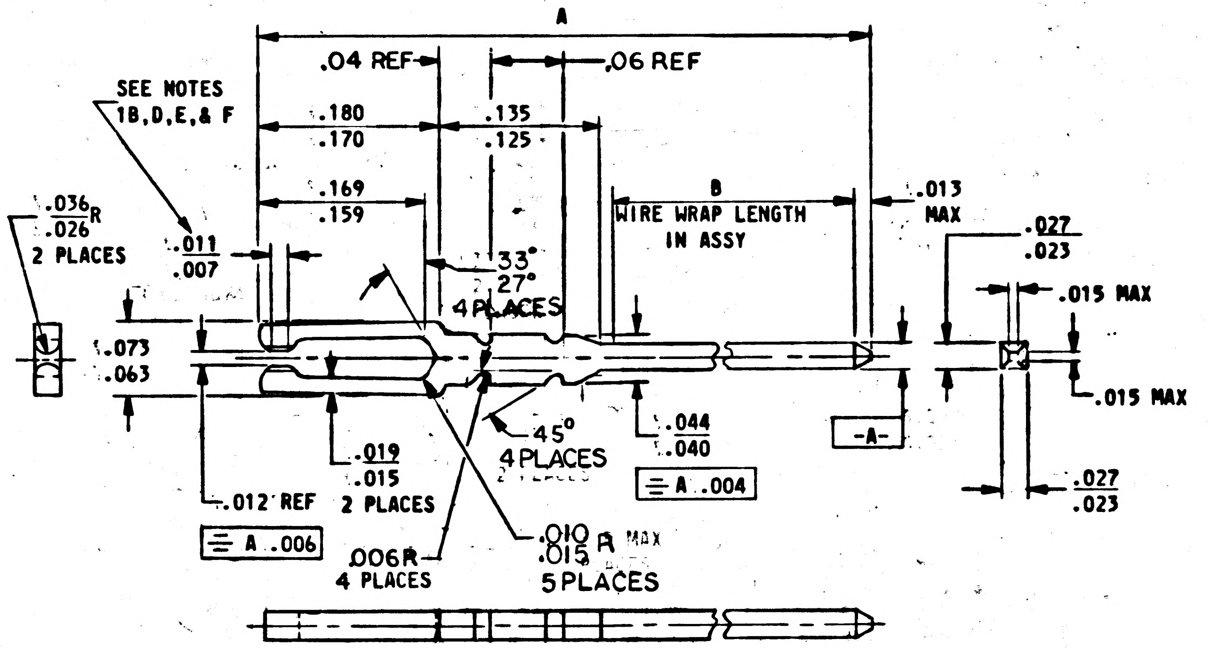

DASH NO.	DIMENSIONS A	DIMENSIONS B REF
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HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 30 Nov 62
CHECKED 13 DEC '62
APPROVAL
APPROVAL
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

H 1006781

REVISIONS TDRR 00189 12.20.62

SYM	DESCRIPTION	DATE	APPROVAL
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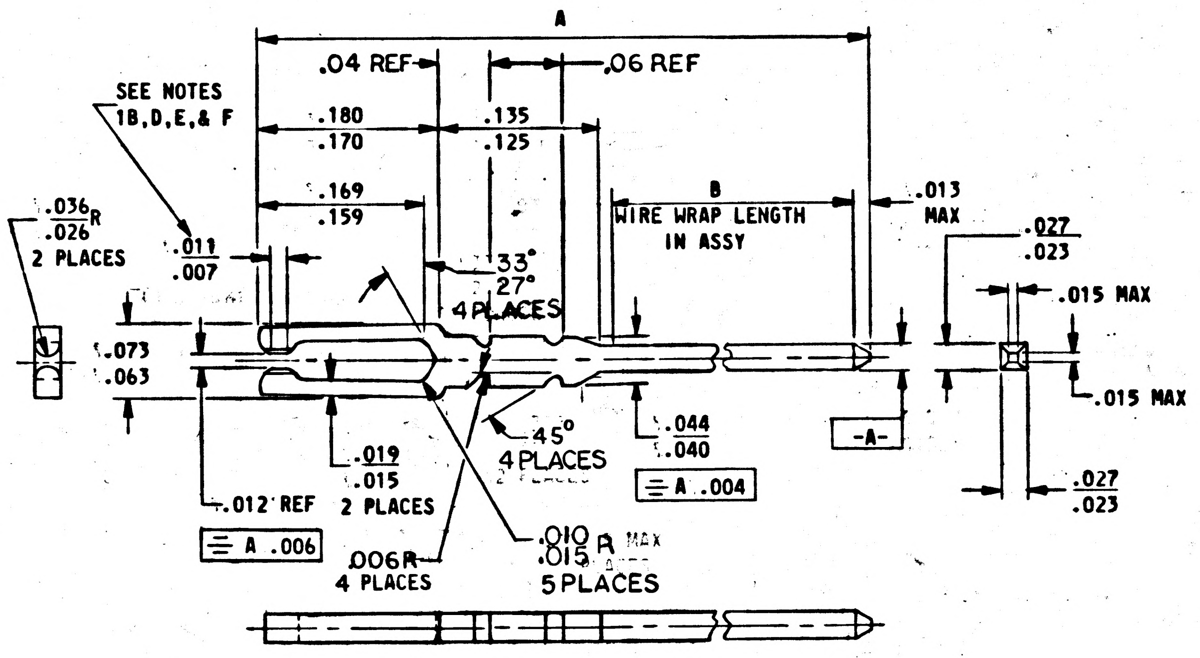

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HEAT TREATMENT: NONE
FINAL FINISH: NONE

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APPROVAL Joe Morton
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MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
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SHEET 1 OF 1

MASTER

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     - (3) SUPPLIERS LOT NUMBER & DATE OF MANUFACTURE
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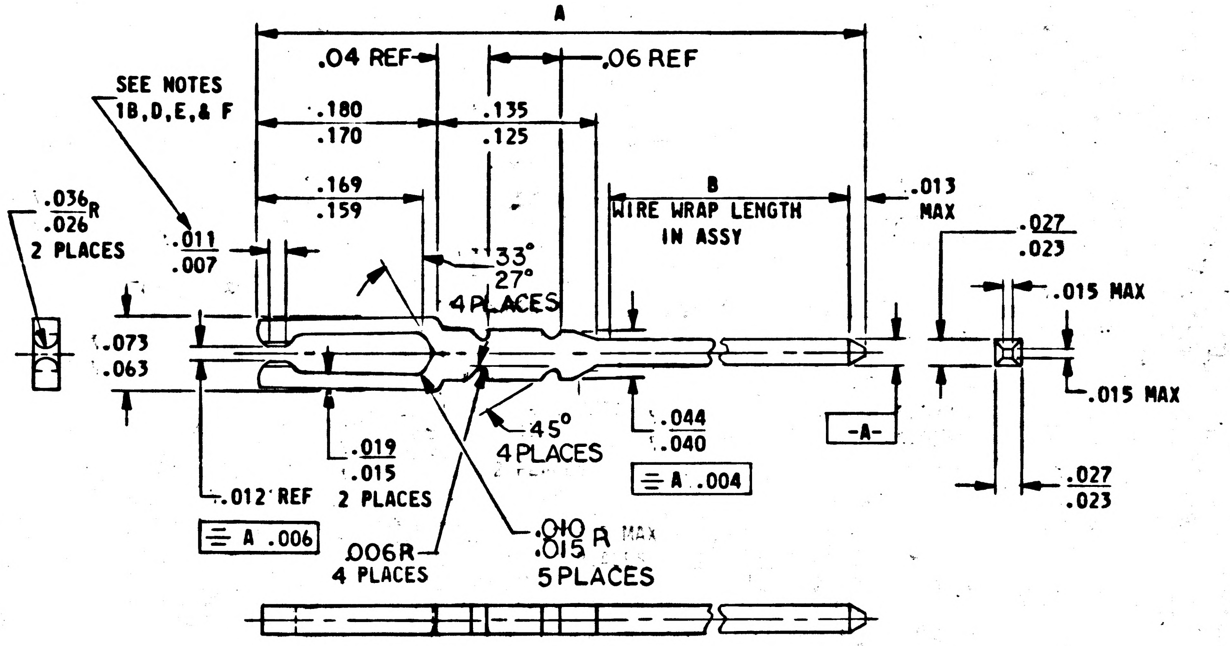


DASH NO.	DIMENSIONS	
	A	B REF
1	.518 .508	.175
2	.693 .683	.350
3	.843 .833	.500
4	.668 .658	.325
5	2.590 2.580	2.247
6	2.473 2.463	2.130
7	1.093 1.083	.750
8	.793 .783	.450
9	2.423 2.413	2.080

PROCURE ONLY FROM APPROVED SOURCES
LISTED ON ND1002034 FOR THIS DRAWING

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL W Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

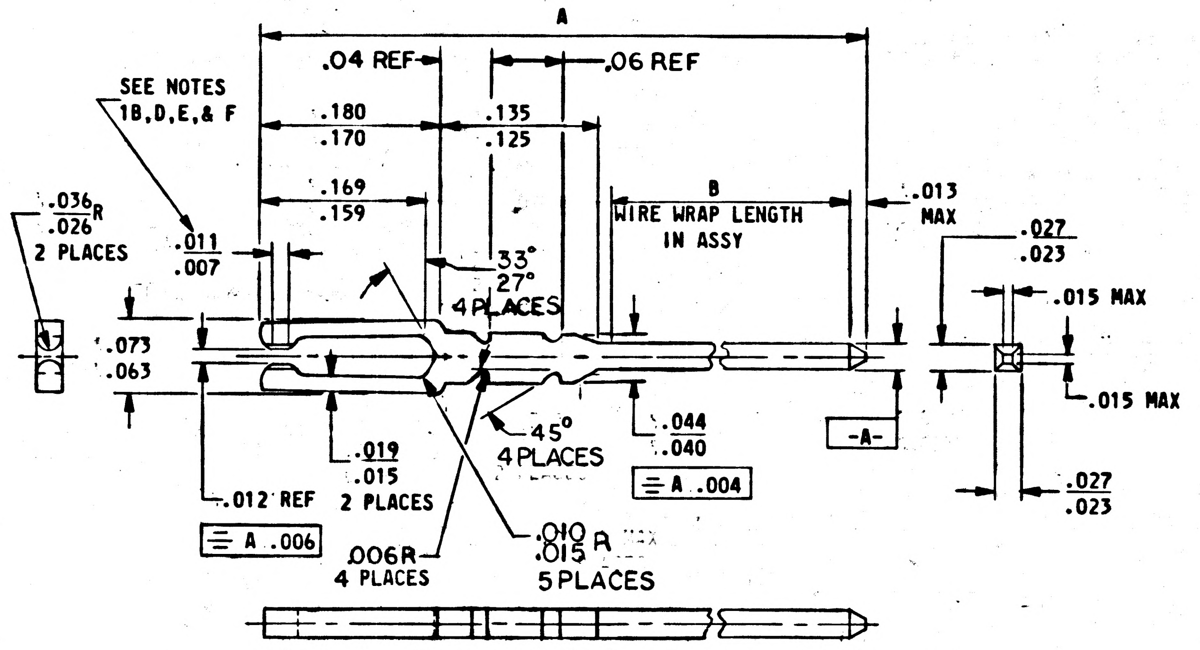
1006781 K

REVISIONS TDRR 00189 12.20.62

SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		
A	REVISED PER TDRR 03036	10 Sep 63	WK
B	REVISED PER TDRR 07004	17 Oct 63	WK
C	REVISED PER TDRR 06704	3/10/64	WK
D	REVISED PER TDRR 11328	4 Jun 64	WK
E	REVISED PER TDRR 13666	[illegible]	WK
F	REVISED PER TDRR 18750	5/11/65	WK
G	REVISED PER TDRR 24029	11/23/65	WK
H	REVISED PER TDRR 25132	1/18/66	WK
J	REVISED PER TDRR 27405	3/29/66	WK
K	REVISED PER TDRR 28151	4/21/66	WK

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER QQ-C-533. ALLOY 172 (BEFORE MANUFACTURING).
   - B. FINISH: GOLD PLATE, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 59-30N SCALE.
   - D. SURFACE QUALITY: 50√ PER STANDARD MIL-STD-10 AT CONTACT AREA.
   - E. INSERTION: 10 OUNCES MAXIMUM.
   - F. RETENTION: 3 OUNCES MINIMUM.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING:
   - A. INTERNAL AND EXTERNAL PACKAGES SHALL BE MARKED PER ND1002019 WITH THE FOLLOWING:
     - (1) SUPPLIERS NAME
     - (2) NASA DRAWING NUMBER, REVISION LETTER, AND DASH NO.
     - (3) SUPPLIERS LOT NUMBER & DATE OF MANUFACTURE
     - (4) MANUFACTURER'S PART NO. MAY APPEAR ON THE PACKAGE.



DASH NO.	DIMENSIONS A	DIMENSIONS B REF
1	.518 .508	.175
2	.693 .683	.350
3	.843 .833	.500
4	.668 .658	.325
5	2.590 2.580	2.247
6	2.473 2.463	2.130
7	1.093 1.083	.750
8	.793 .783	.450
9	2.423 2.413	2.080
10	.743 .733	.400

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL W Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

L 1006781

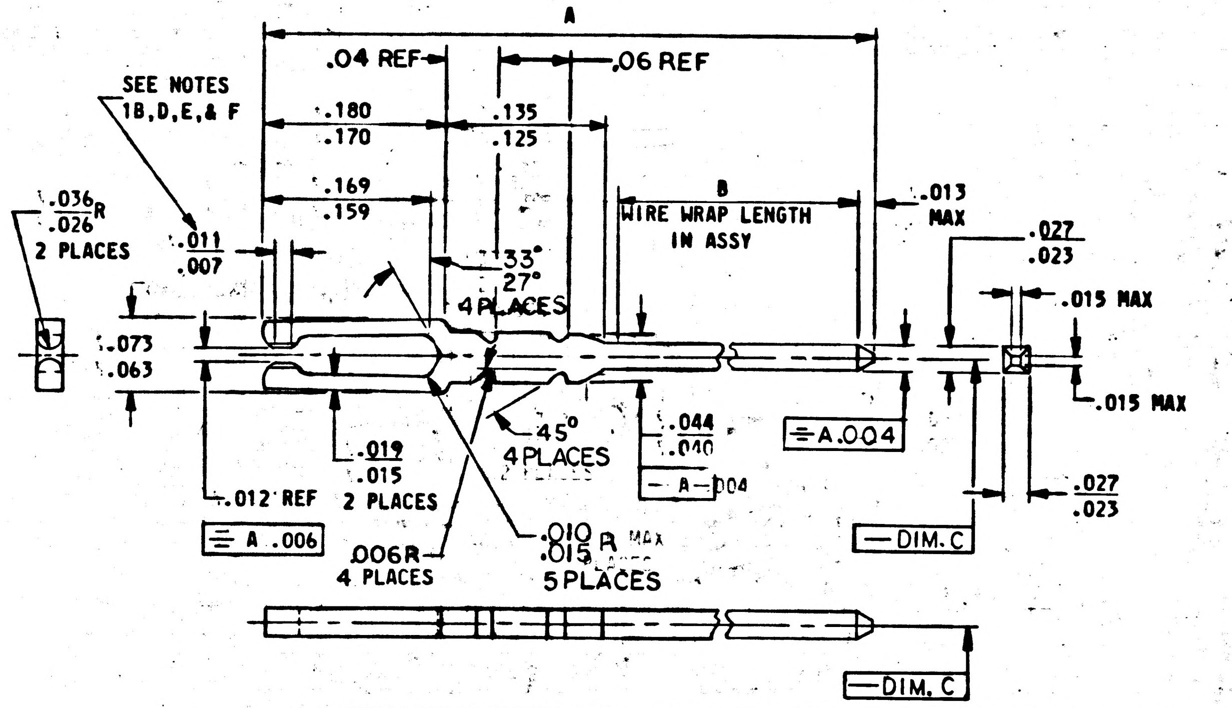
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		
A	REVISED PER TDRR 03036	10 Sep 63	WK
B	REVISED PER TDRR 04004	17 Oct 63	WK
C	REVISED PER TDRR 06704	3/10/64	WK
D	REVISED PER TDRR 11328	[illegible] 64	WK
E	REVISED PER TDRR 13666	[illegible]	WK
F	REVISED PER TDRR 18750	5/11/65	WK
G	REVISED PER TDRR 24029	11/23/65	WK
H	REVISED PER TDRR 25132	1/18/66	WK
J	REVISED PER TDRR 27405	3/29/66	WK
K	REVISED PER TDRR 28151	4/21/66	WK
L	REVISED PER TDRR 29092	6-1-66	[illegible]

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER QQ-C-533. ALLOY 172 (BEFORE MANUFACTURING).
   - B. FINISH: GOLD PLATE, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 59-30N SCALE.
   - D. SURFACE QUALITY: $\sqrt[50]{}$ PER STANDARD MIL-STD-10 AT CONTACT AREA.
   - E. INSERTION: 10 OUNCES MAXIMUM.
   - F. RETENTION: 3 OUNCES MINIMUM.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
   - H. SYMMETRY: PART MAYBE RESTRAINED DURING MEASUREMENT
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING:
   - A. INTERNAL AND EXTERNAL PACKAGES SHALL BE MARKED PER ND1002019 WITH THE FOLLOWING:
     - (1) SUPPLIERS NAME
     - (2) NASA DRAWING NUMBER, REVISION LETTER, AND DASH NO.
     - (3) SUPPLIERS LOT NUMBER & DATE OF MANUFACTURE
     - (4) MANUFACTURER'S PART NO. MAY APPEAR ON THE PACKAGE.
4. PRESERVATION, PACKAGING AND PACKING PER ND1002215, CLASS 1, CODE 3



DASH NO.	DIMENSIONS A	B REF	C
1	.518 .508	.175	.010
2	.693 .683	.350	.010
3	.843 .833	.500	.010
4	.668 .658	.325	.010
5	2.590 2.580	2.247	.031
6	2.473 2.463	2.130	.031
7	1.093 1.083	.750	
8	.793 .783	.450	
9	2.423 2.413	2.080	
10	.743 .733	.400	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Roy Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

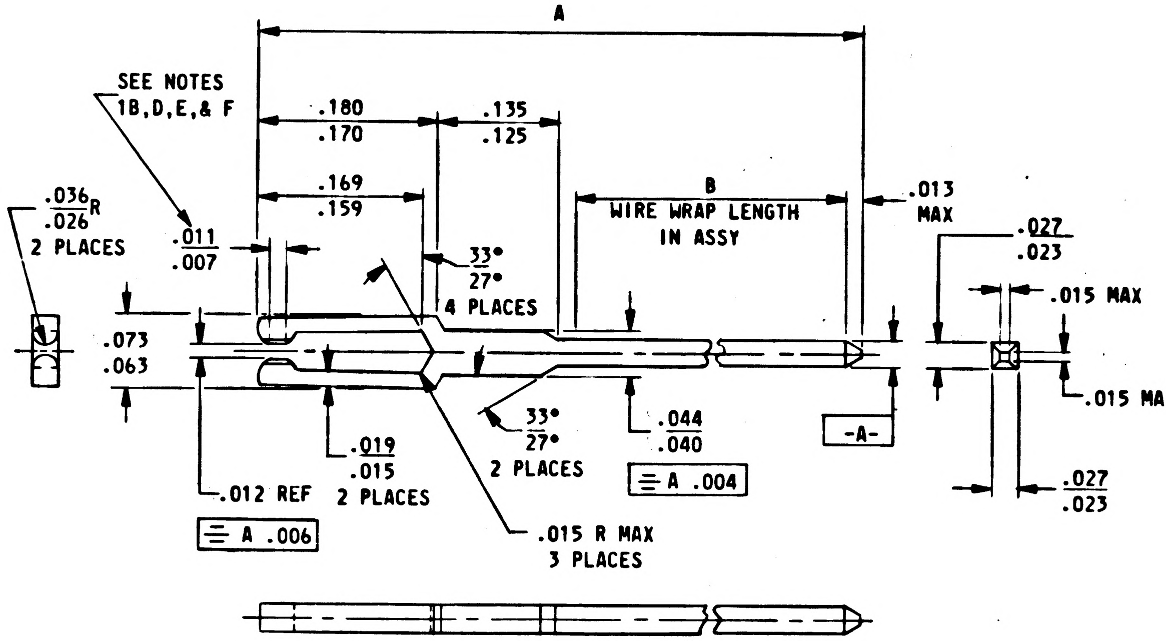
REVISIONS TORR 00169 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
	ORIGINATED		

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER QQ-C-533.
   - B. FINISH: GOLD PLATE, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 36C MINIMUM.
   - D. SURFACE QUALITY: $\sqrt{}^{50}$ PER STANDARD MIL-STD-10 AT CONTACT AREA.
   - E. INSERTION: 10 OUNCES MAXIMUM.
   - F. RETENTION: 3 OUNCES MINIMUM.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DASH NO.	DIMENSIONS A	DIMENSIONS B	MALCO PART NUMBER
1	.515 .511	.177 .173	
2	.690 .686	.352 .348	
3	.840 .836	.502 .498	5190002



ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 30 Nov 62
CHECKED H Maynard 13 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan

NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL W Hoffer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST, FEMALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006781
SCALE NONE
WT
SHEET 1 OF 1

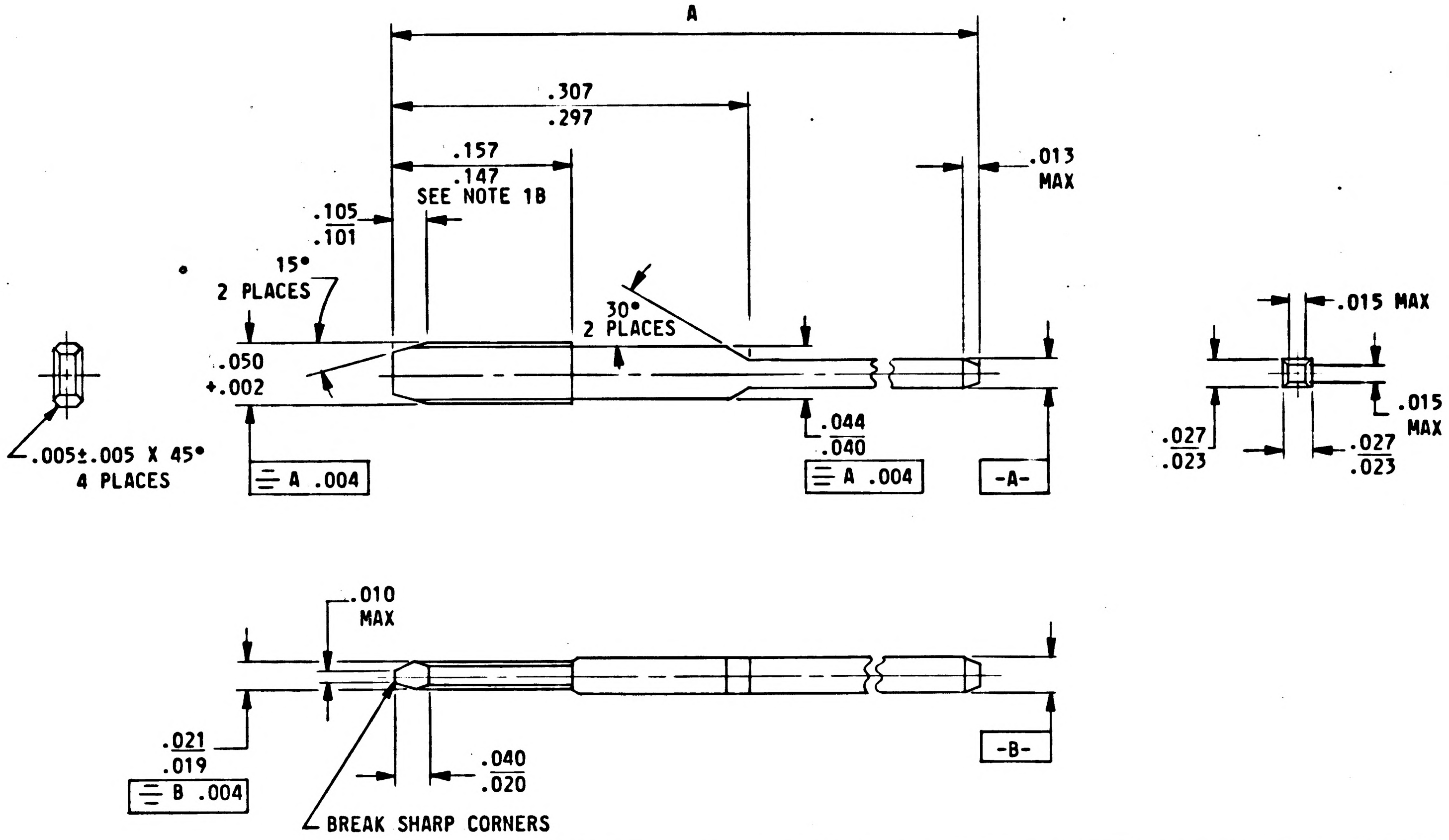
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006782 A

REVISIONS TORR 00189 12·20·62			
SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 00290	1·23·63	

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLIUM COPPER PER FEDERAL SPECIFICATION QQ-C-533.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 36C MINIMUM.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM -A-	MALCO PART NO.
1	.413 .403	
2	.843 .833	5190005
3	.555 .545	
4	1.317 1.307	

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED A. Maynard 14 DEC 62
APPROVAL Joe Morton
APPROVAL E. J. Duggan
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

1006782 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

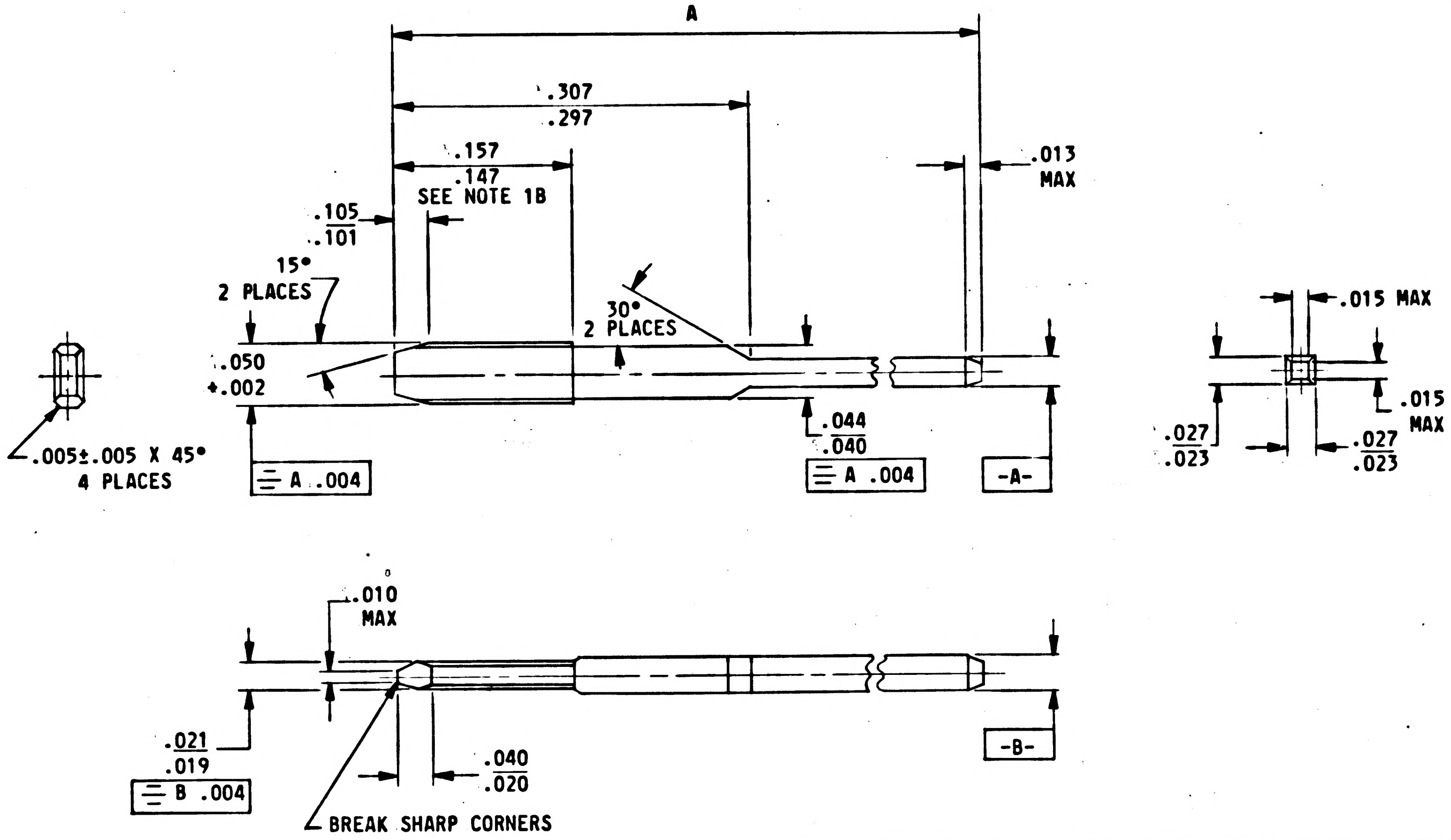
B 1006782

REVISIONS TORR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63	DCT	WK.

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: COPPER PER FEDERAL SPECIFICATION QQ-C-533.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 36C MINIMUM.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM -A-	MALCO PART NO.
1	.413 .403	
2	.843 .833	5190005
3	.555 .545	
4	1.317 1.307	
5	1.412 1.402	

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS

CODE IDENT NO. 91886

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL D. Duggan
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

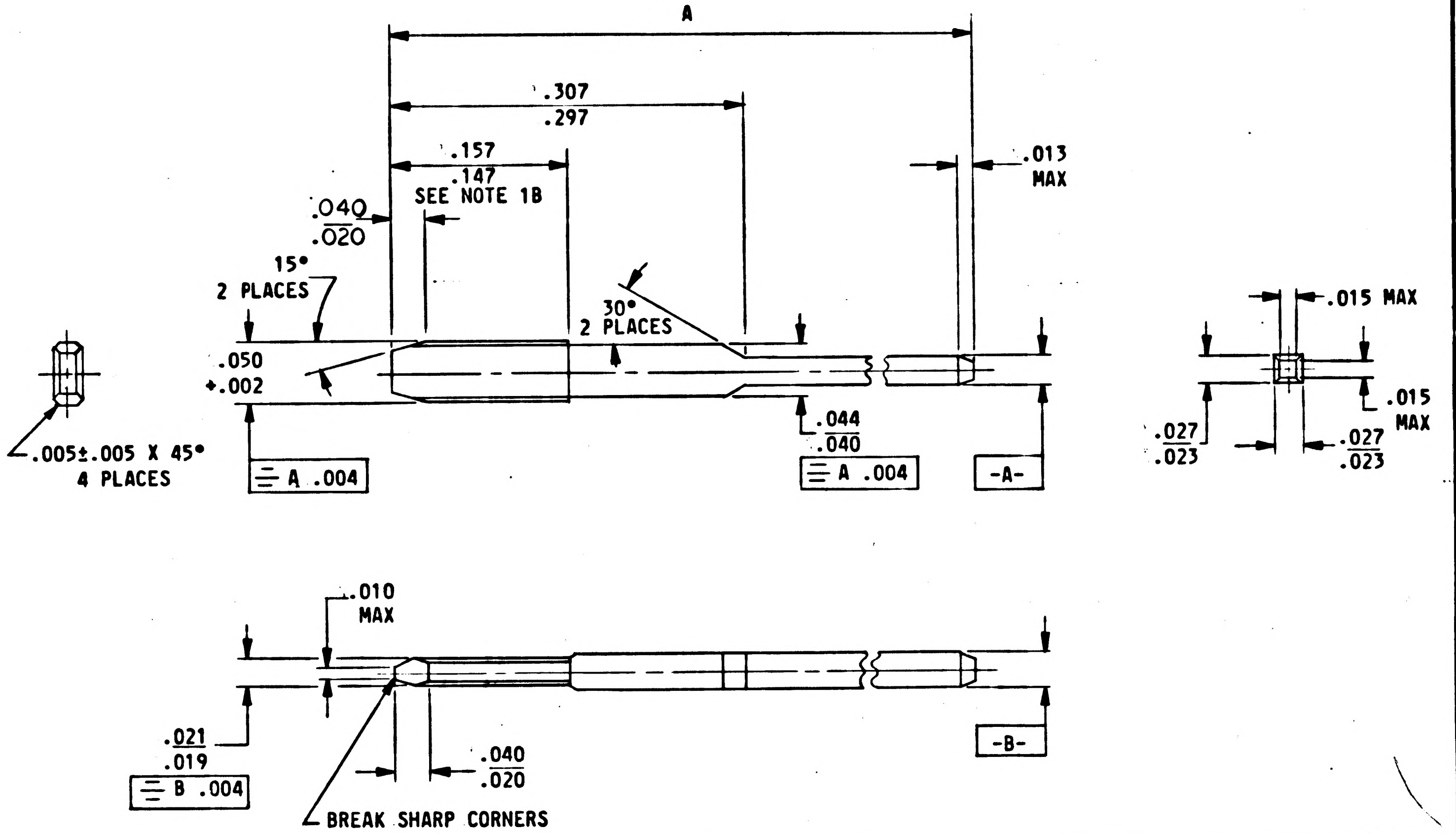
1006782

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00189 12·20·62				
SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63		WK
C	REVISED PER TDRR 00561	3-13-63		WK

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: COPPER PER FEDERAL SPECIFICATION QQ-C-533.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 36C MINIMUM.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM -A-	MALCO PART NO.
1	.413 .403	
2	.843 .833	5190005
3	.555 .545	
4	1.317 1.307	
5	1.412 1.402	

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS

CODE IDENT NO. 91886

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC 62
APPROVAL Joe Morton
APPROVAL D. Duggan
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006782 D

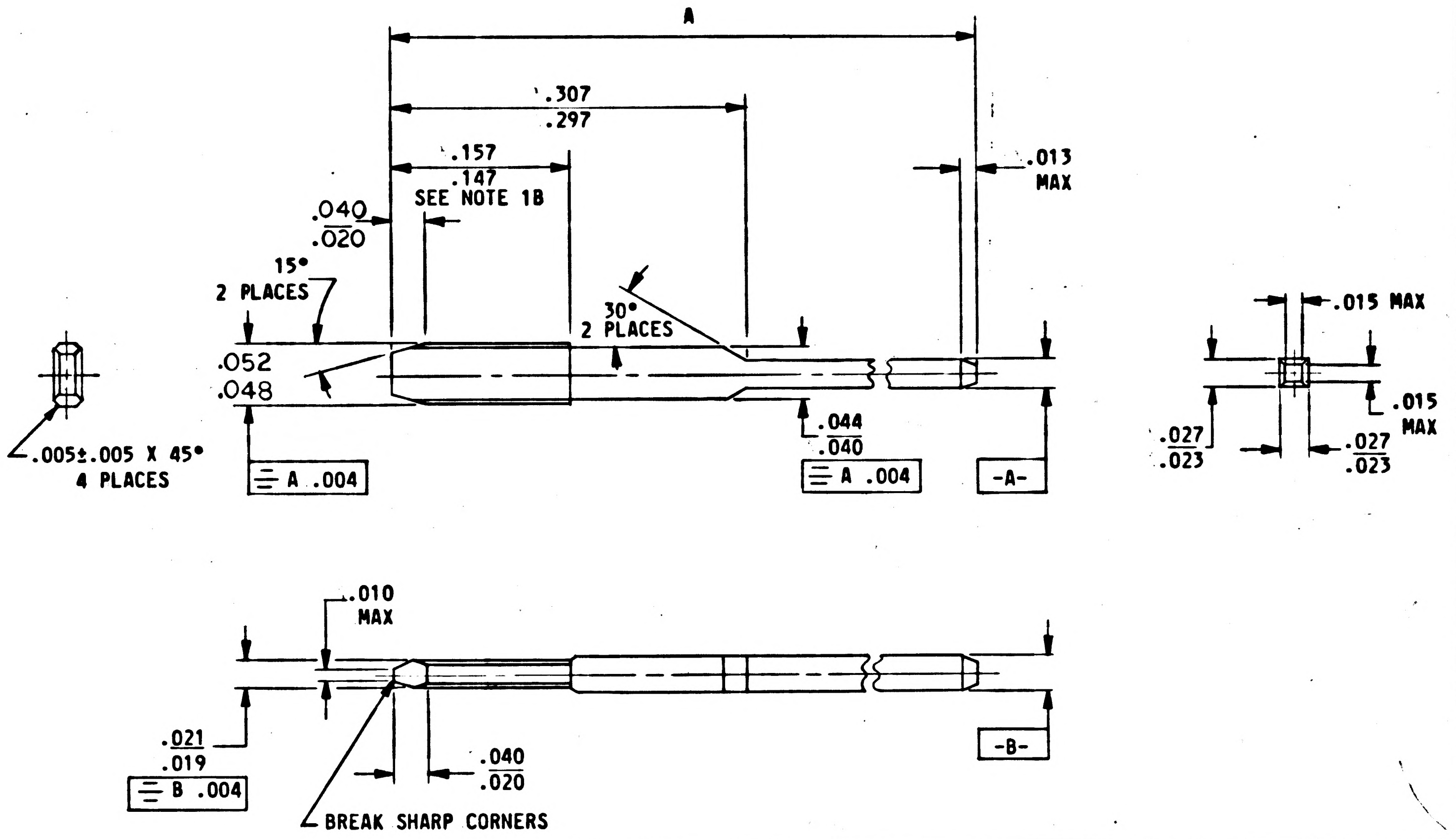
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63	DET	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: ~~BRASS, PER FEDERAL SPECIFICATION~~ QQ-B-613b, COMPOSITION 2, TEMPER HARD, ULTRA FINE GRAIN
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM -A-	MALCO PART NO.
1	.413 .403	
2	.843 .833	5190005
3	.555 .545	
4	1.317 1.307	
5	1.412 1.402	

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS

CODE IDENT NO. 91886

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED F. Maynard 14 DEC 62
APPROVAL Joe Morton
APPROVAL D. Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006782
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

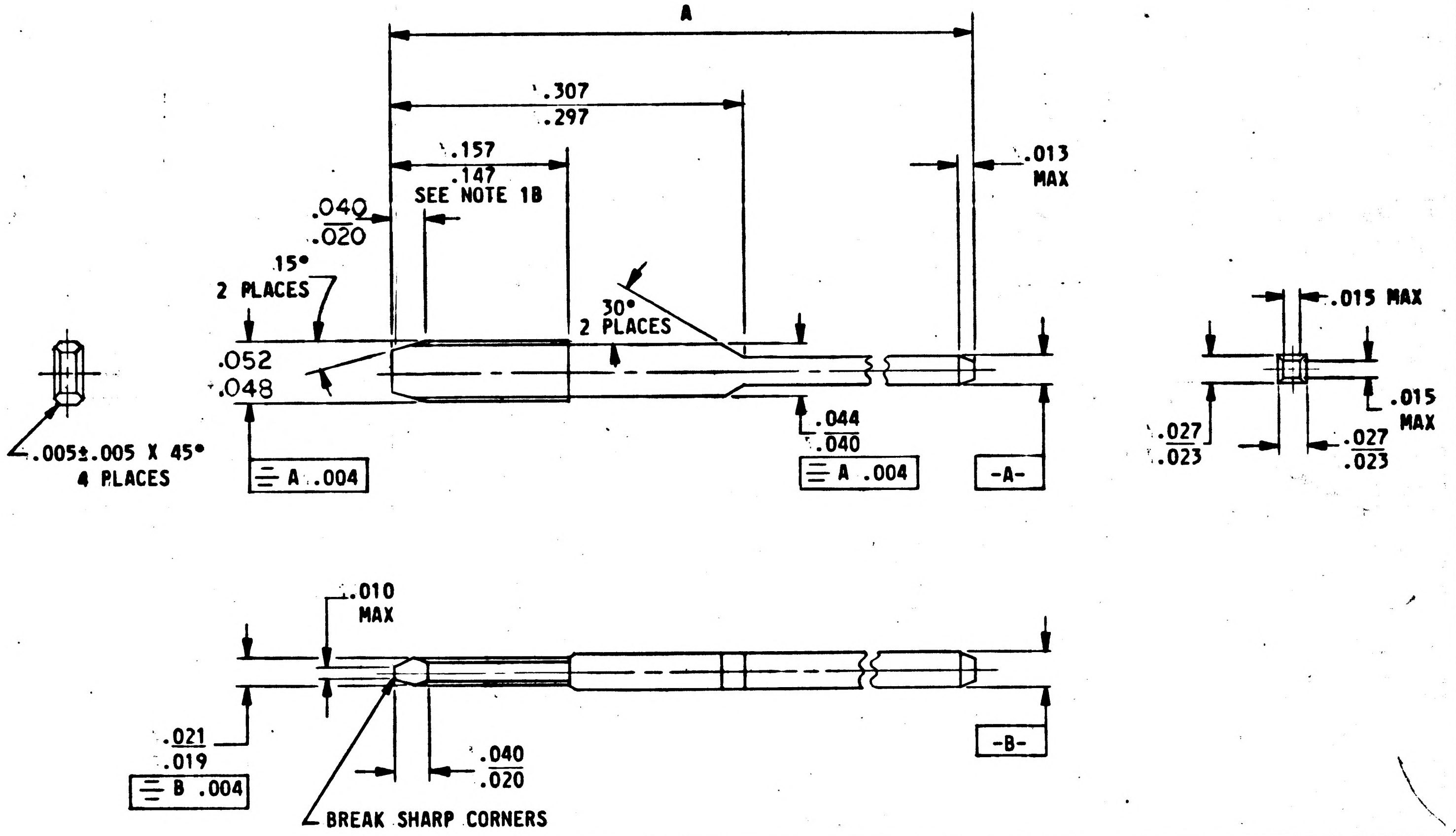
E 1006782

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00189 12.20.62			
SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 00290	1.23.63	WR
B	REVISED PER TDRR 00350	2.6.63	DET WR
C	REVISED PER TDRR 00561	3-13-63	WR
D	REVISED PER TDRR 01164	5-8-63	WR
E	REVISED PER TDRR 02392	8/7/63	

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: ~~BRASS, PER FEDERAL SPECIFICATION~~ QQ-B-613b, COMPOSITION 2, TEMPER HARD, ULTRA FINE GRAIN
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM -A-
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray W Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

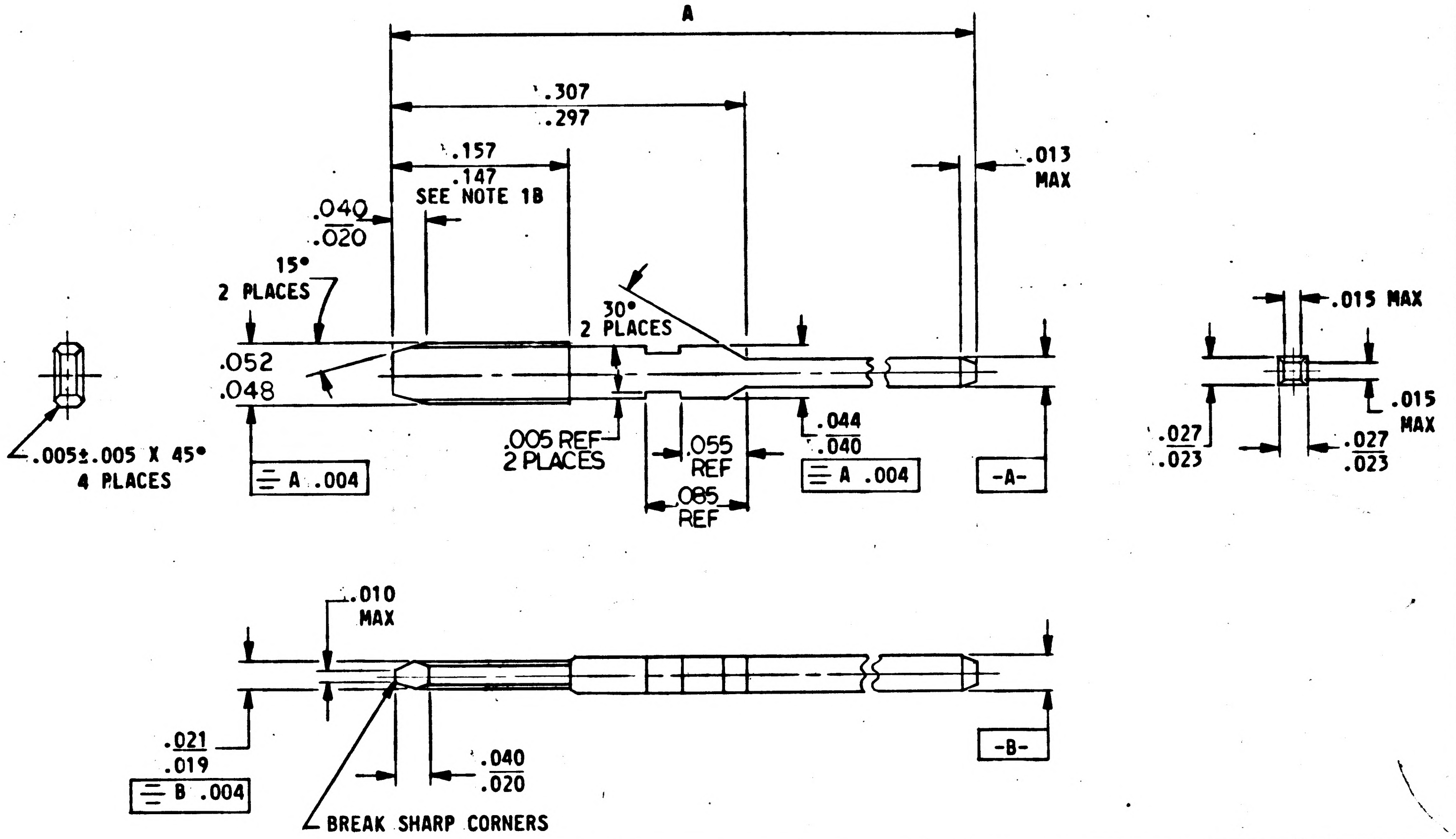
F 1006782

REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	4·23·63		WK
B	REVISED PER TDRR 00350	2·6·63	DCT	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: NICKEL PER MIL-N-46025 (INTERNATIONAL NICKEL CO.) HUNTINGTON ALLOY #200.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM A
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL Duggan
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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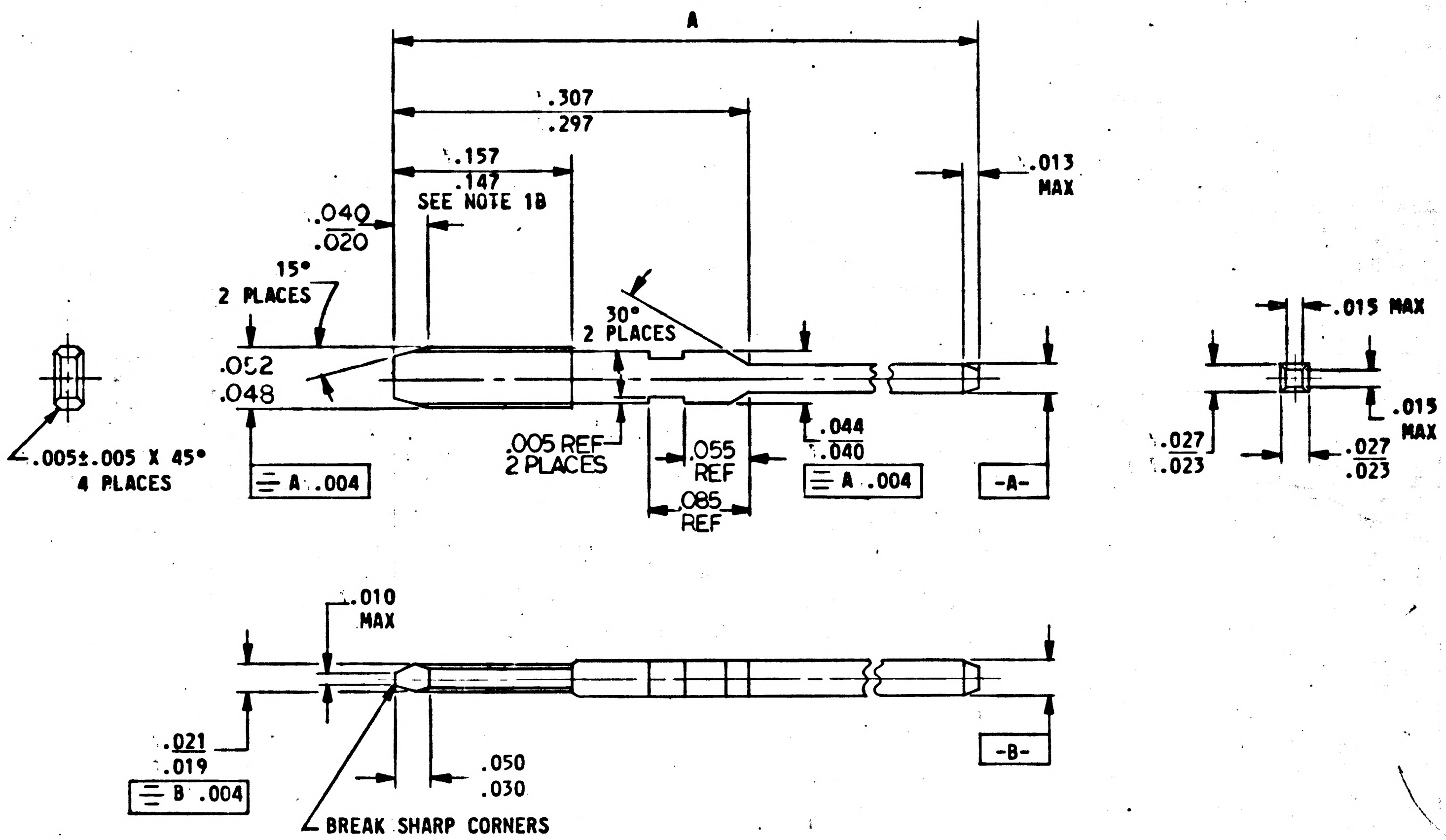
1006782 G

REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63	DBT	WK.
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		DW
G	REVISED PER TDRR 03513	30 Oct 63		WK

NOTES:

1. REQUIREMENTS:
   A. MATERIAL: NICKEL PER MIL-N-46025 (INTERNATIONAL NICKEL CO.) HUNTINGTON ALLOY #200.
   B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM A
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray W. [illegible] DATE 4 Dec 62
CHECKED [illegible] Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL J Duggan

NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

1006782 H

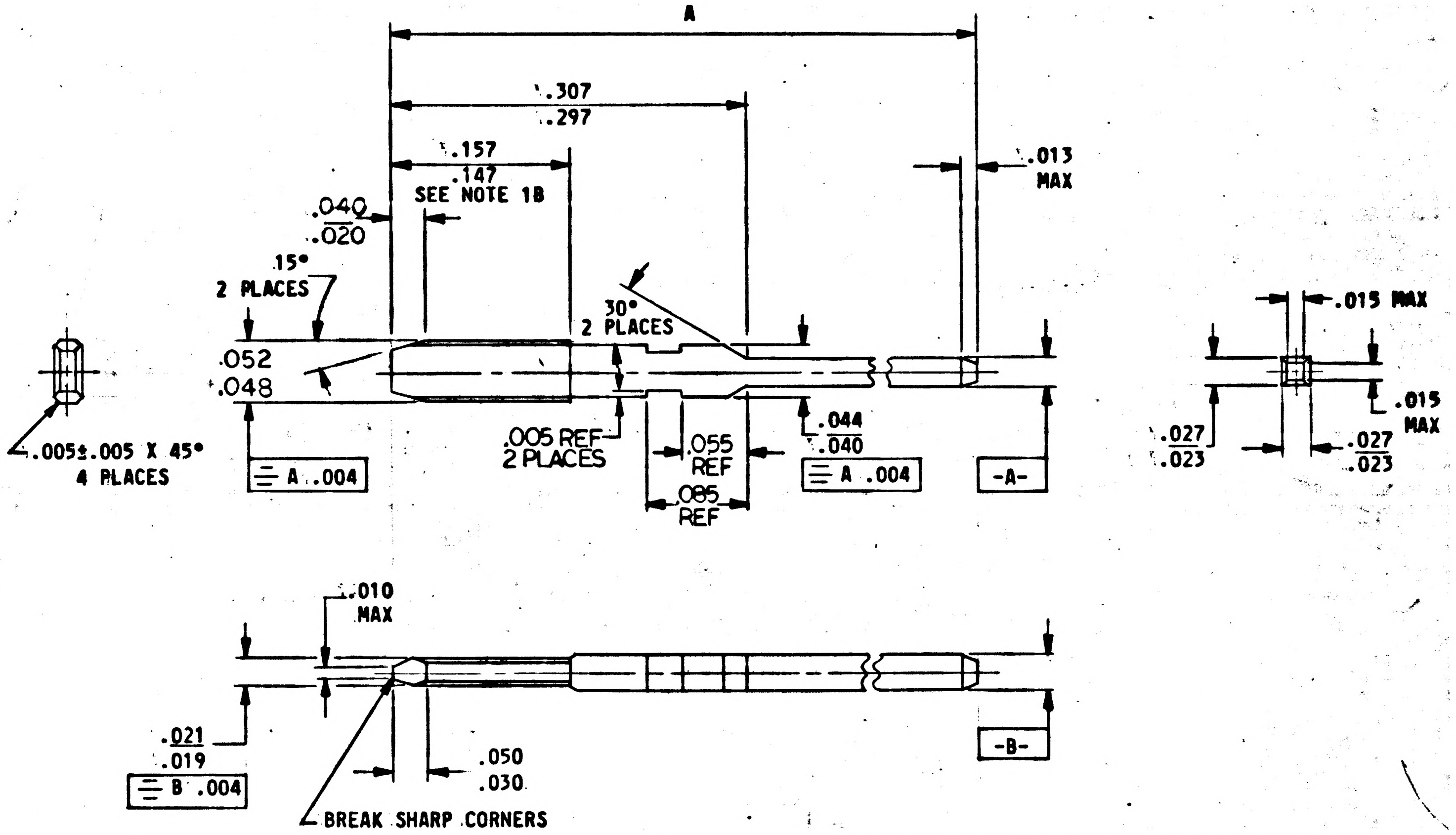
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TORR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1-23-63		WK
B	REVISED PER TDRR 00350	2-6-63		WK.
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		
G	REVISED PER TDRR 03513	30 Oct 63		WK
H	REVISED PER TDRR 04695	11/26/63		WK.

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: NICKEL PER MIL-N-46025 (INTERNATIONAL NICKEL CO.) HUNTINGTON ALLOY #200.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA. QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.



DASH NO.	DIM A
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: SEE NOTES
FINAL FINISH: SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL Duggan
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006782

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006782 J

	REVISIONS TDRR 00189 12·20·62		
SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 00290	1·23·63	WK
B	REVISED PER TDRR 00350	2·6·63	WK
C	REVISED PER TDRR 00561	3-13-63	WK
D	REVISED PER TDRR 01164	5-8-63	WK
E	REVISED PER TDRR 02392	8/7/63	
F	REVISED PER TDRR 02817	8/28/63	DW
G	REVISED PER TDRR 03513	30Oct63	WK
H	REVISED PER TDRR 04695	11/26/63	WK
J	REVISED PER TDRR 06428	26 Feb 64	WK

NOTES:

1. REQUIREMENTS:

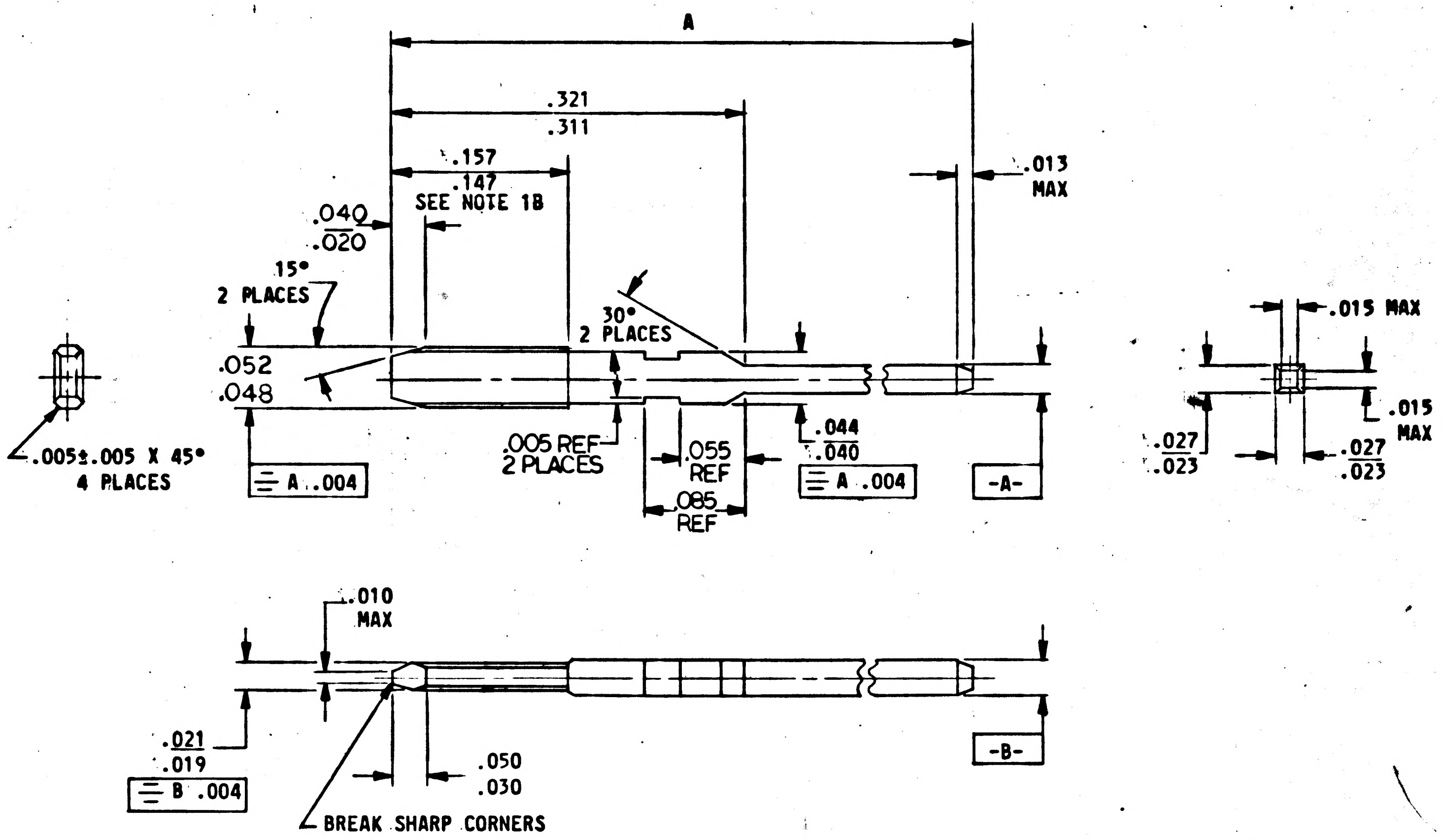
   A. MATERIAL: NICKEL PER MIL-N-46025 (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200.

   B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA: QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3

2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.



DASH NO.	DIM -A-
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray W Seeler DATE 4 Dec 62
CHECKED A Maynard 14 DEC 62
APPROVAL Joe Martin
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

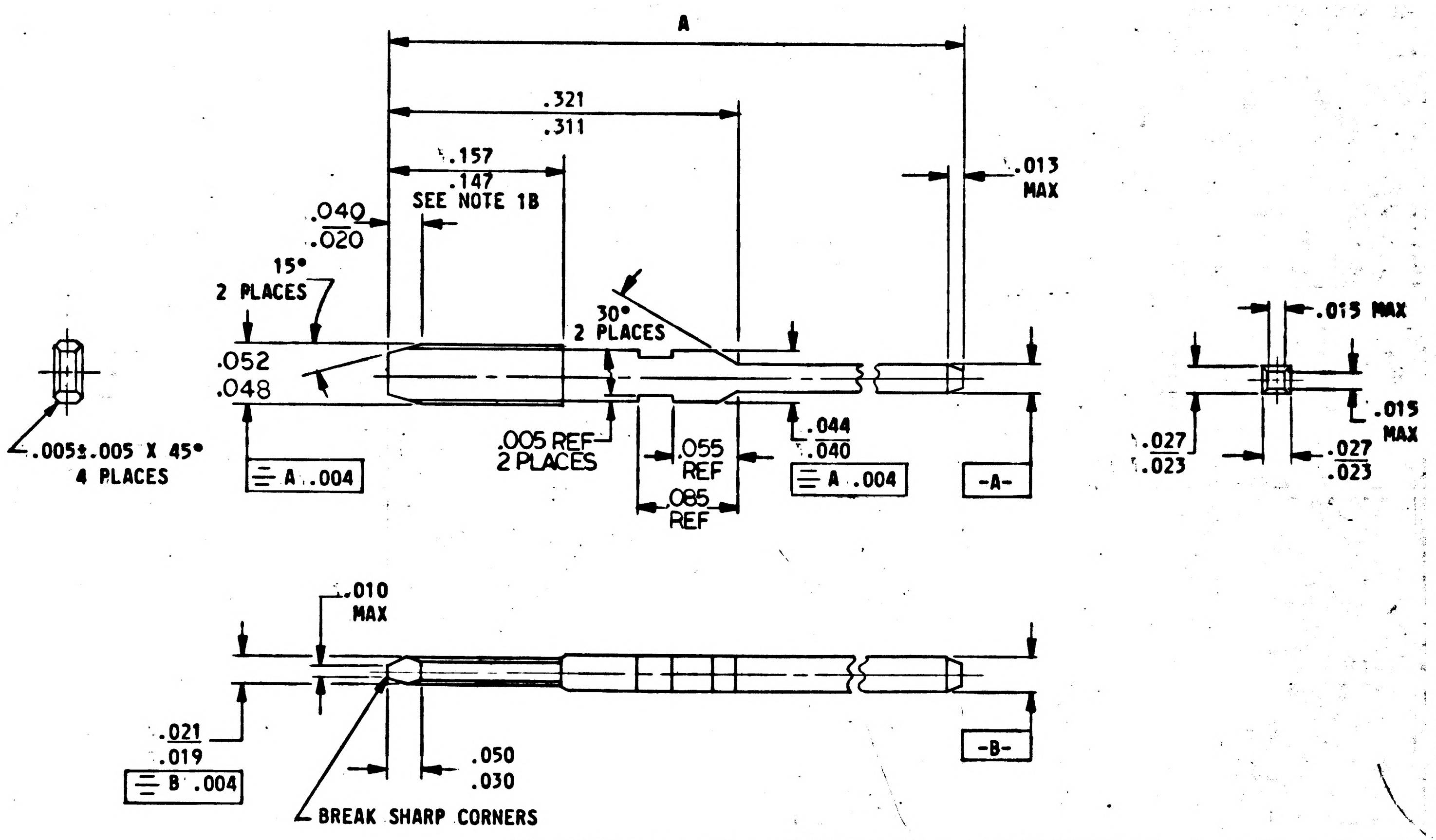
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006782 K

REVISIONS TDRR 00189 12-20-62				
SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1-23-63		WK
B	REVISED PER TDRR 00350	2-6-63	DDT	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		DW
G	REVISED PER TDRR 03513	30 Oct 63		WK
H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428	26 Feb 64		WK
K	REVISED PER TDRR 08007	28 Apr 64	WK	

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.



DASH NO.	DIM -A-
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450
7	1.612 1.602

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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APPLICATION	

UNLESS OTHERWISE SPECIFIED
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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED A Maynard 14 DEC 62
APPROVAL Joe Morton
APPROVAL J Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

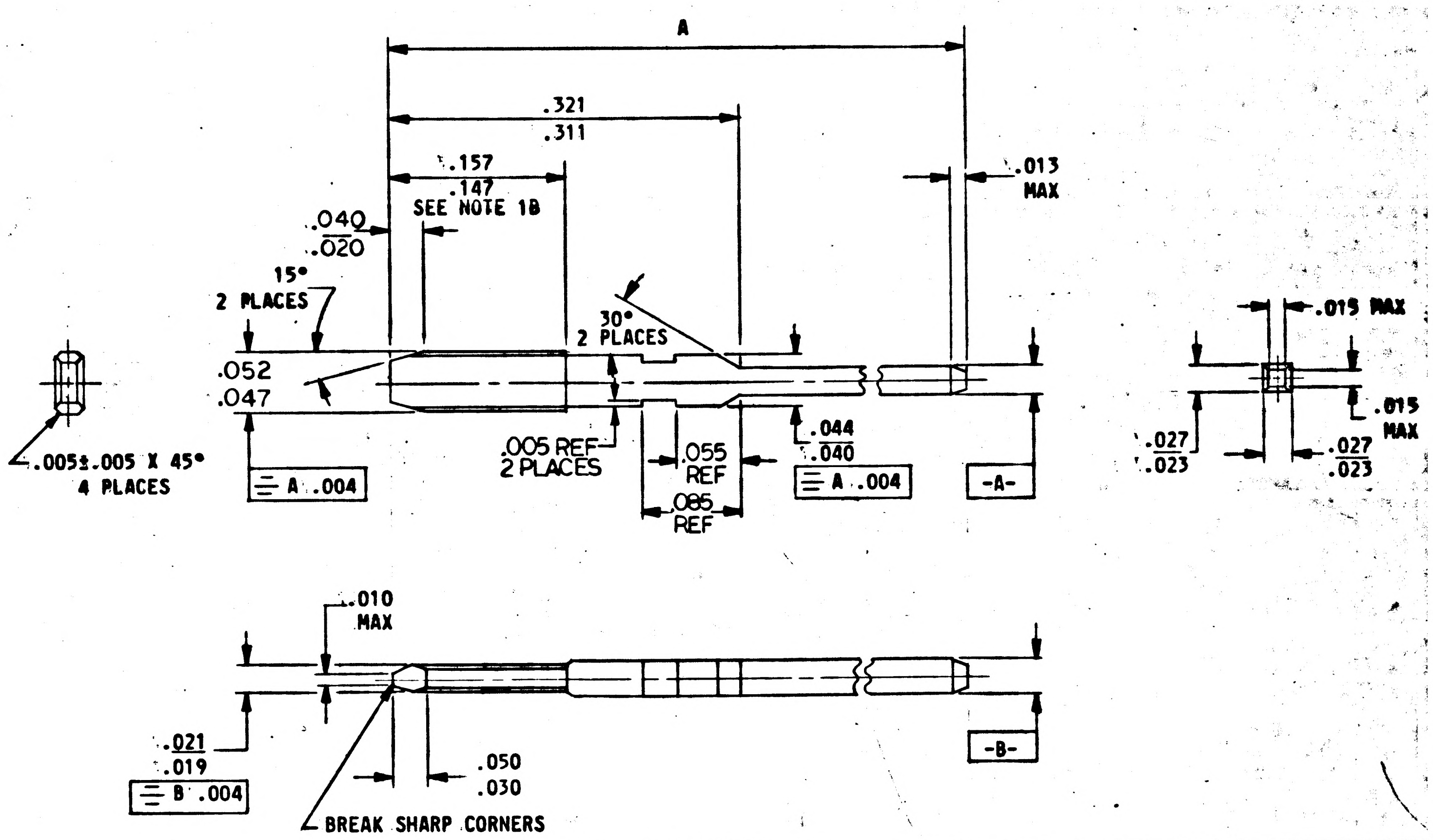
1006782 L

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00149 12-20-62				
SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1-23-63		WK
B	REVISED PER TDRR 00350	2-6-63	DDT	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		WK
F	REVISED PER TDRR 02817	8/28/63		DW
G	REVISED PER TDRR 03513	30Oct63		WK
H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428	26Feb64		WK
K	REVISED PER TDRR 08007	28Apr64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.



DASH NO.	DIM -A-
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450
7	1.612 1.602

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Martin
APPROVAL Duggan
NASA APPROVAL W.J. Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006782 | M

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00149 12-20-62				
SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1-23-63		WK
B	REVISED PER TDRR 00350	2-6-63	DDT	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	6-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		
G	REVISED PER TDRR 03513	30 Oct 63		WK
H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428	26 Feb 64		WK
K	REVISED PER TDRR 08007	28 Apr 64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 12307	9-1-64		

NOTES:

1. REQUIREMENTS:

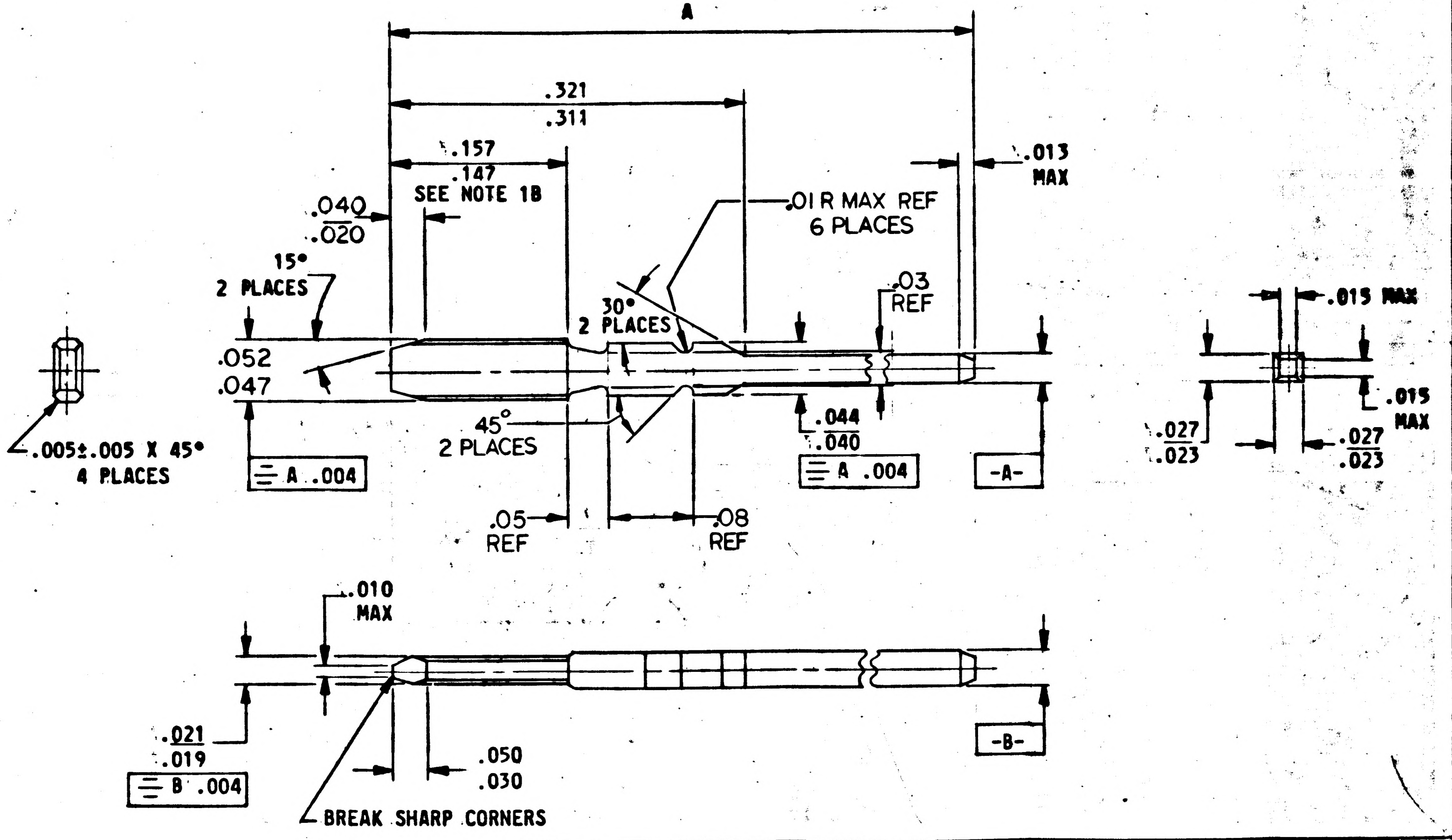
A. MATERIAL: NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200.

B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA QQ-S-365, .0002 MINIMUM THICKNESS AT CONTACT AREA.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3

2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.



DASH NO.	DIM -A-
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450
7	1.612 1.602

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Haynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

N 1006782

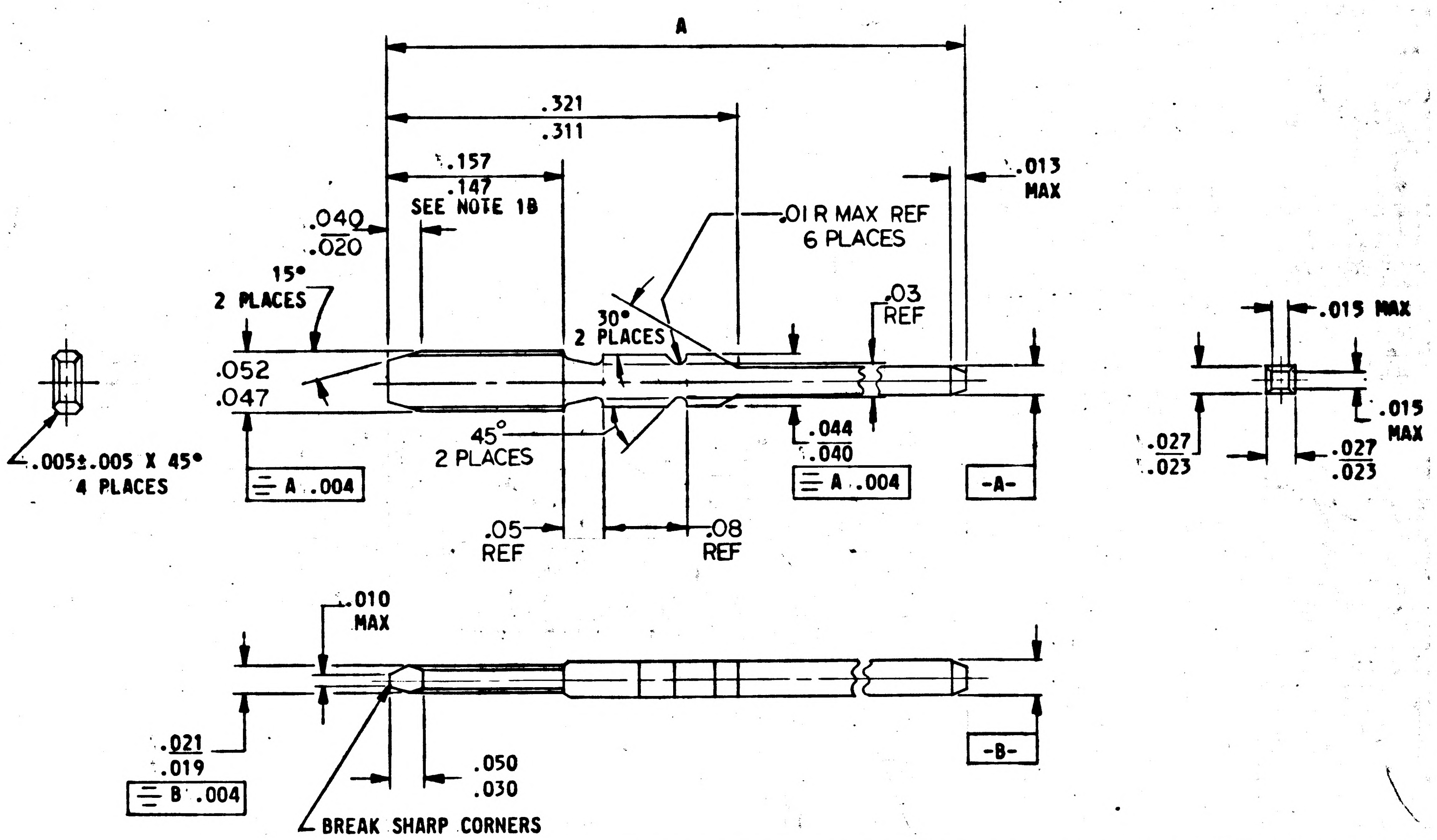
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200, HALF HARD, HARDNESS ROCKWELL "B" 75-90.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA
   - C. A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.

REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63	DDT	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		
G	REVISED PER TDRR 03513	30 Oct 63		WK
H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428	26 Feb 64		WK
K	REVISED PER TDRR 08007	28 APR 64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 12307	9·1·64		
N	REVISED PER TDRR 17916		WK	



DASH NO.	DIM -A-
1	.413 .403
2	.843 .833
3	.555 .545
4	1.317 1.307
5	1.412 1.402
6	.460 .450
7	1.612 1.602

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray W Seeley DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL Duggan
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

1006782 P

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00189 12·20·62				
SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63		WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		
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H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428	28 Feb 64		WK
K	REVISED PER TDRR 08007	28 APR 64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 12307	9·1·64	RPK	
N	REVISED PER TDRR 17916	4/21/65	WK	
P	REVISED PER TDRR 18749	5/18/65	WK	

NOTES:

1. REQUIREMENTS:
   MATERIAL: (SEE TABLE)
   - A. (1) NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200, HALF HARD, HARDNESS ROCKWELL "B" 75-90.
     (2) BRASS PER MIL-C-895
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA
   - C. A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
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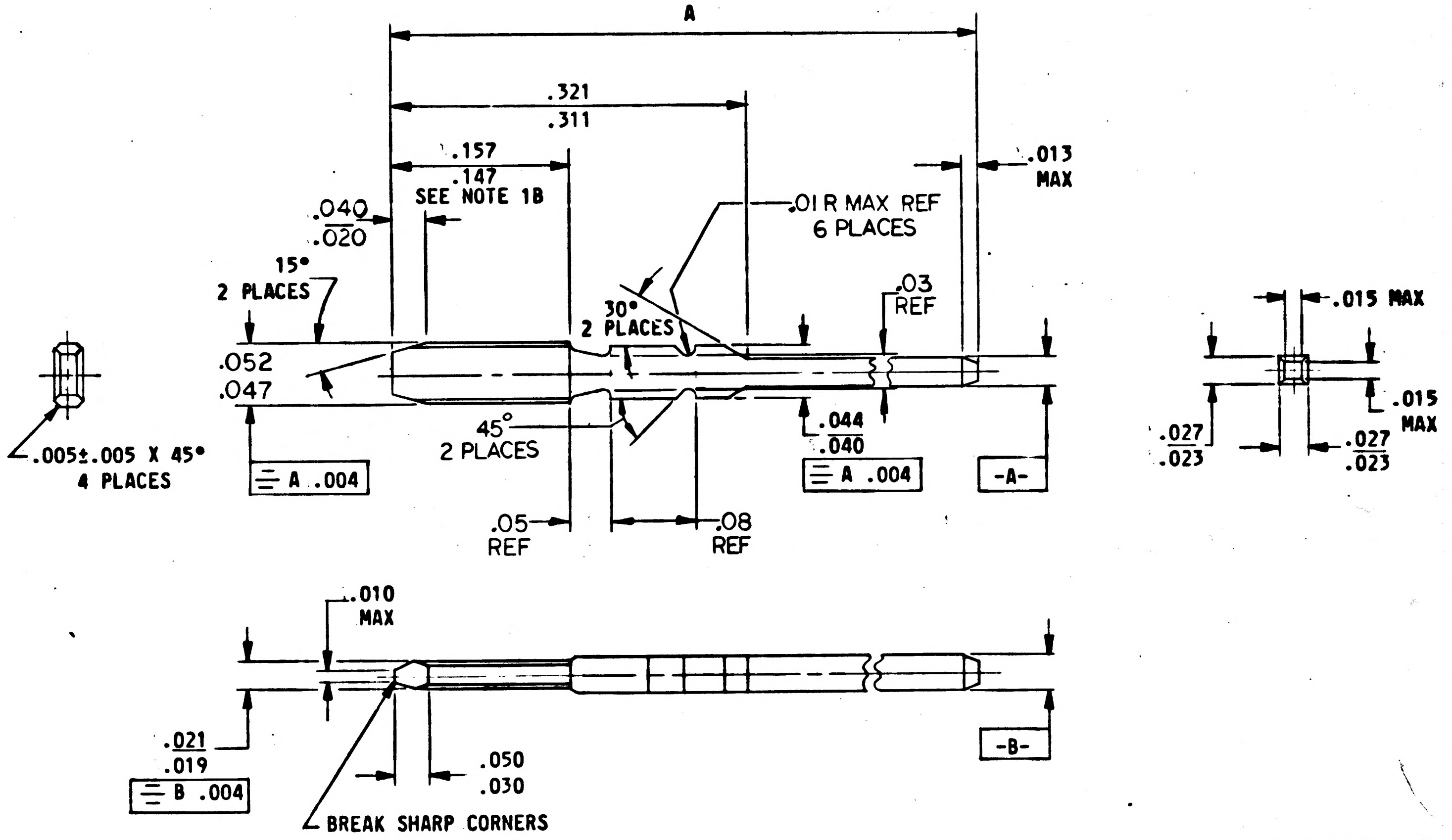
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.



DASH NO.	DIM A	MATERIAL
1	.413 .403	NICKEL
2	.843 .833	NICKEL
3	.555 .545	NICKEL
4	1.317 1.307	NICKEL
5	1.412 1.402	NICKEL
6	.460 .450	NICKEL
7	1.612 1.602	NICKEL
8	1.070 1.060	NICKEL
9	2.500 2.490	BRASS
10	2.475 2.465	BRASS
6	.460 .450	
–	[illegible]	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED A. Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL J. Duggan
NASA APPROVAL W. J. Rhine 12·20·62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

1006782 R

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. REQUIREMENTS:
   MATERIAL: (SEE TABLE)
   - A. (1) NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200, HALF HARD, HARDNESS ROCKWELL "B" 75-90. (HARDNESS OF STRIP FROM WHICH PARTS ARE FABRICATED.)
     (2) BRASS PER MIL-C-895
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA.
   - C. A STRIP OF MATERIAL AND A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
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REVISIONS TDRR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1-23-63		WK
B	REVISED PER TDRR 00350	2-6-63		WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
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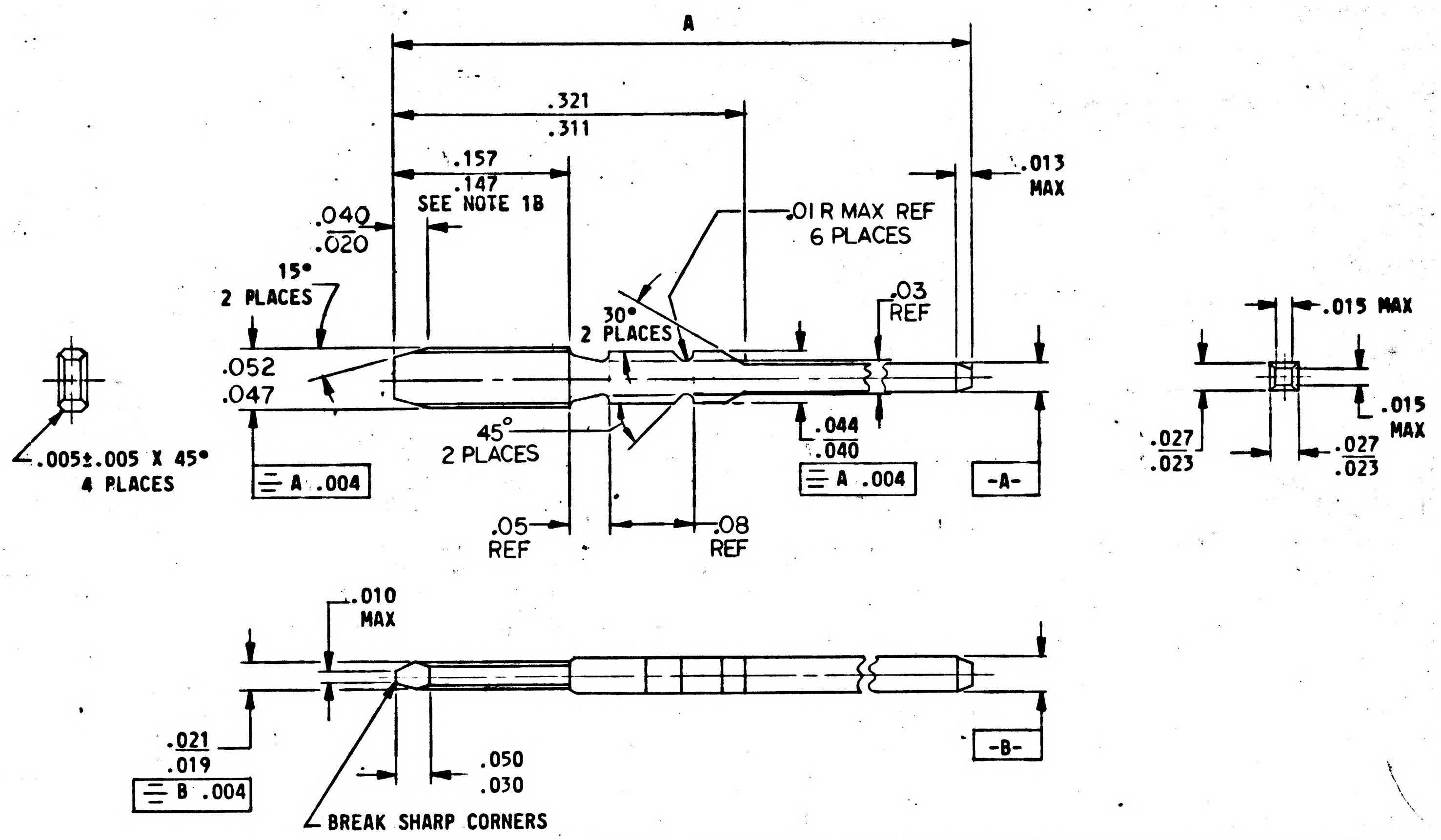
H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428	28 Feb 64		WK
K	REVISED PER TDRR 08007	28 APR 64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 12307	9-1-64		
N	REVISED PER TDRR 17916		WK	
P	REVISED PER TDRR 18749	5/18/65	WK	
R	REVISED PER TDRR 21588	8/24/65	WK	



DASH NO.	DIM A	MATERIAL
1	.413 .403	NICKEL
2	.843 .833	NICKEL
3	.555 .545	NICKEL
4	1.317 1.307	NICKEL
5	1.412 1.402	NICKEL
6	.460 .450	NICKEL
7	1.612 1.602	NICKEL
8	1.070 1.060	NICKEL
9	2.500 2.490	BRASS
10	2.475 2.465	BRASS
6	.460 .450	
	1.612	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL Duggan
NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

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S 1006782

NOTES:

1. REQUIREMENTS:
   MATERIAL: (SEE TABLE)
   A. (1) NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200, HALF HARD, HARDNESS ROCKWELL "B" 75-90. (HARDNESS OF STRIP FROM WHICH PARTS ARE FABRICATED.)
      (2) BRASS PER QQ-B-613 COMPOSITION 2, SPRING (BASE MATERIAL BEFORE MANUFACTURING)
   B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA
   C. A STRIP OF MATERIAL AND A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
   D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
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REVISIONS TDRR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1-23-63		WK
B	REVISED PER TDRR 00350	2-6-63	DET	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WR
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		
G	REVISED PER TDRR 03513	3 Oct 63		WK
H	REVISED PER TDRR 04695	11/26/63		WK
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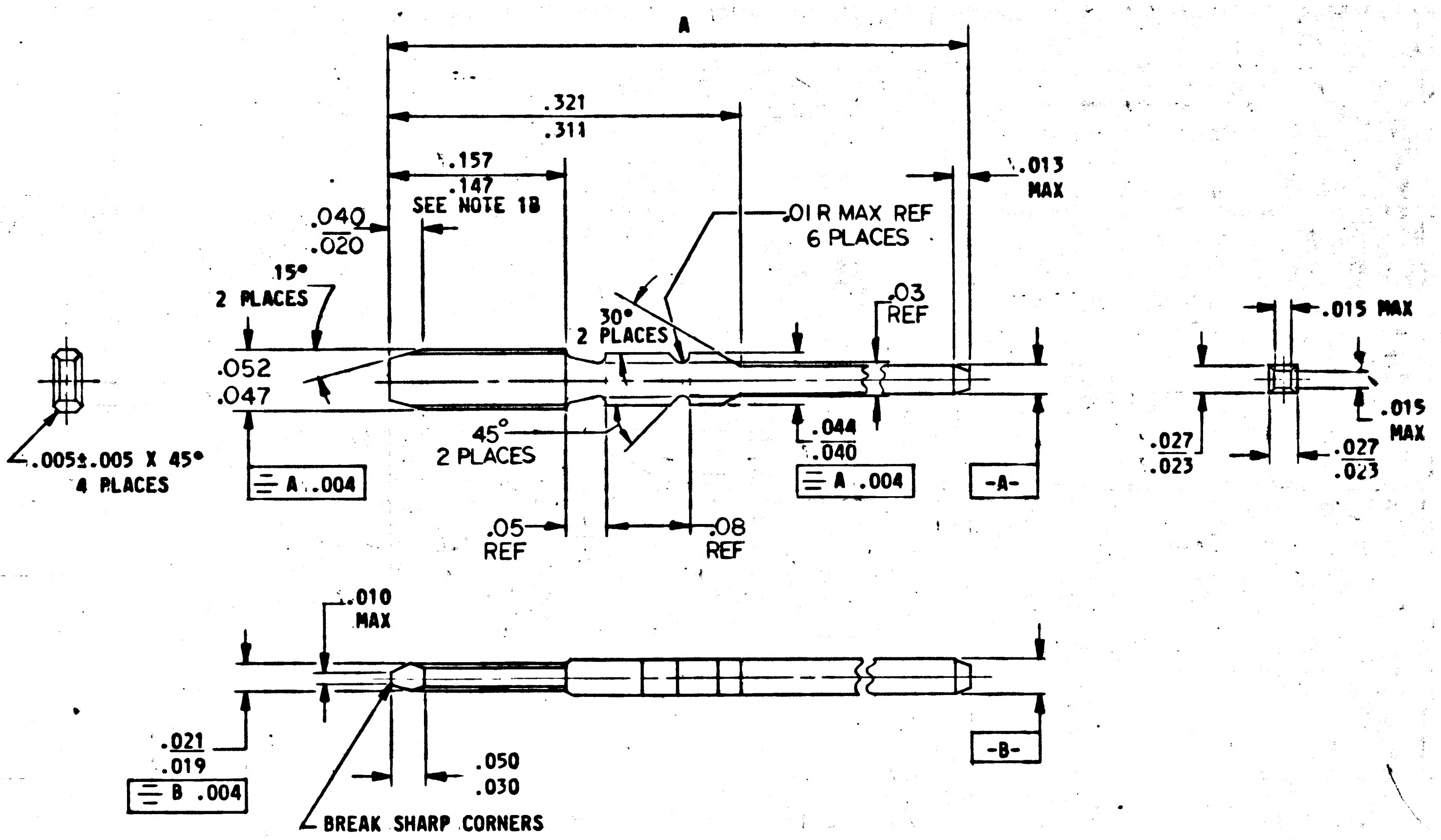
K	REVISED PER TDRR 08007	28 APR 64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 12307	9-1-64		
N	REVISED PER TDRR 17916		WK	
P	REVISED PER TDRR 18749	5/11/65	WK	
R	REVISED PER TDRR 21588	8/24/65	WK	
S	REVISED PER TDRR 25133	1/18/66	WK	



DASH NO.	DIM A	MATERIAL
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7	1.612 1.602	NICKEL
8	1.070 1.060	NICKEL
9	2.500 2.490	BRASS
10	2.475 2.465	BRASS
11	1,161 1,151	NICKEL
12	2.500 2.490	NICKEL

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
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CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
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HOUSTON, TEXAS

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WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
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NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

4 3 2 1

1006782 T

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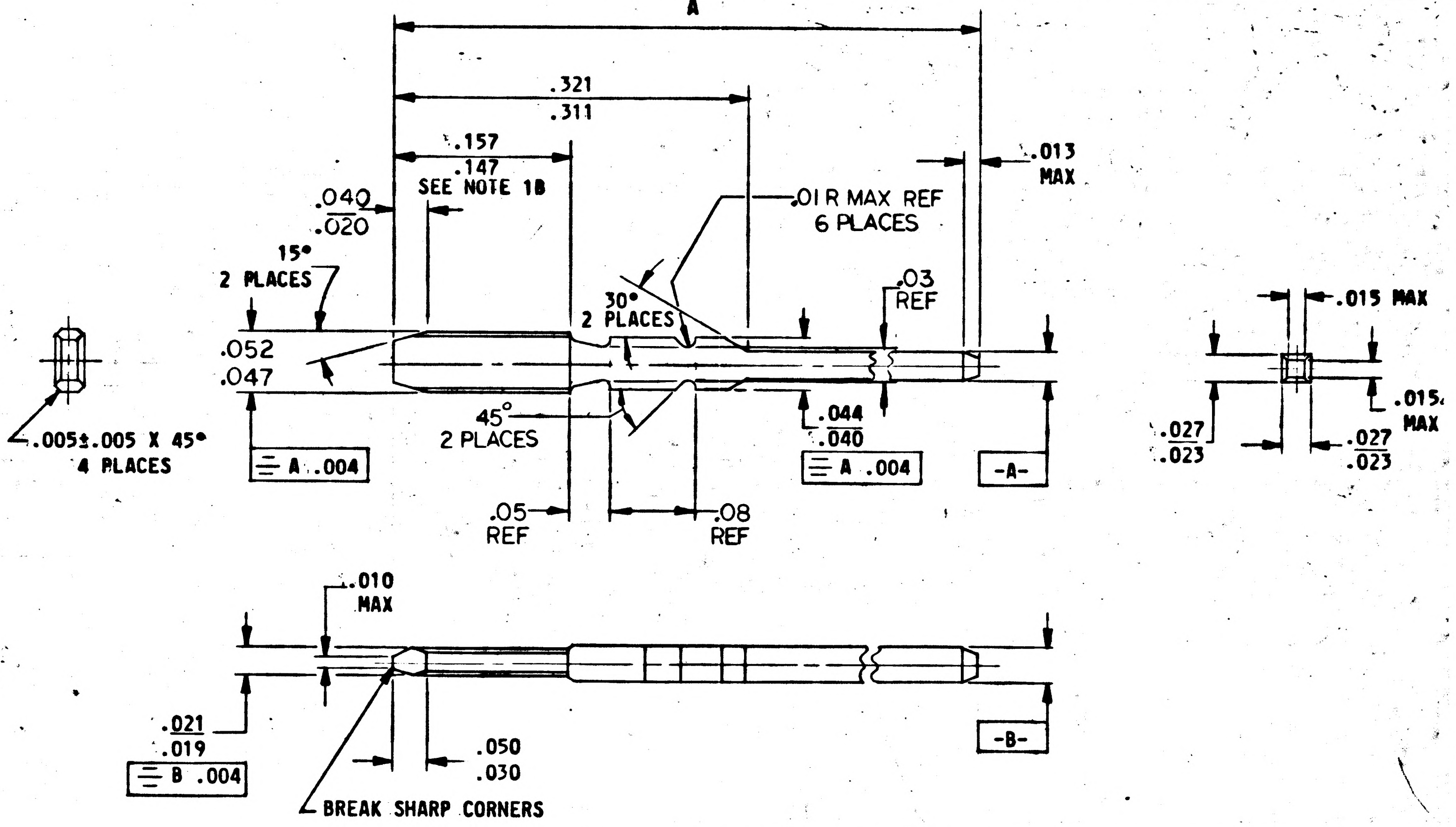
NOTES:

1. REQUIREMENTS:
   MATERIAL: (SEE TABLE)
   - A. (1) NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200, HALF HARD, HARDNESS ROCKWELL "B" 75-90. (HARDNESS OF STRIP FROM WHICH PARTS ARE FABRICATED.)
     (2) BRASS PER QQ-B-613 COMPOSITION 2, SPRING (BASE MATERIAL BEFORE MANUFACTURING)
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA
   - C. A STRIP OF MATERIAL AND A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH SHIPMENT.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALL AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIER'S NAME, AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.

REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63	DCT	WK
C	REVISED PER TDRR 00561	3-13-63		WK
D	REVISED PER TDRR 01164	5-8-63		WK
E	REVISED PER TDRR 02392	8/7/63		
F	REVISED PER TDRR 02817	8/28/63		
G	REVISED PER TDRR 03513	3Oct63		WK
H	REVISED PER TDRR 04695	11/24/63		WK
J	REVISED PER TDRR 06428	[illegible]		WK
K	REVISED PER TDRR 08007	28APR64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 1·2307	9·1·64		
N	REVISED PER TDRR 17916	4/21/65	WK	
P	REVISED PER TDRR 18749	[illegible]	WK	
R	REVISED PER TDRR 21588	8/24/65	WK	
S	REVISED PER TDRR 25133	1/18/66	WK	
T	REVISED PER TDRR 27404	[illegible]	WK	



DASH NO.	DIM. A	MATERIAL
1	.413 .403	NICKEL
2	.843 .833	NICKEL
3	.555 .545	NICKEL
4	1.317 1.307	NICKEL
5	1.412 1.402	NICKEL
6	.460 .450	NICKEL
7	1.612 1.602	NICKEL
8	1.070 1.060	NICKEL
9	2.500 2.490	BRASS
10	2.475 2.465	BRASS
11	1,161 1,151	NICKEL
12	2.500 2.490	NICKEL

DASH NO.	DIM. A	MATERIAL
13	.793 .783	NICKEL
14	2.425 2.415	BRASS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray W Wheeler DATE 4 Dec 62
CHECKED A. Maynard 14 DEC 62
APPROVAL Joe Martin
APPROVAL J Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

4 3 2 1

U	1006782

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H	REVISED PER TDRR 04695	11/26/63	WK
J	REVISED PER TDRR 06428	26 Feb 64	WK
K	REVISED PER TDRR 08007	28 APR 64	WK WK
L	REVISED PER TDRR 10267	6/24/64	WK
M	REVISED PER TDRR 12307	9·1·64	
N	REVISED PER TDRR 17916	4/21/65	WK
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R	REVISED PER TDRR 21588	8/24/65	WK
S	REVISED PER TDRR 25133	1/18/66	WK
T	REVISED PER TDRR 27404	3/29/66	WK
U	REVISED PER TDRR 29091	5/26/66	MGB

NOTES:

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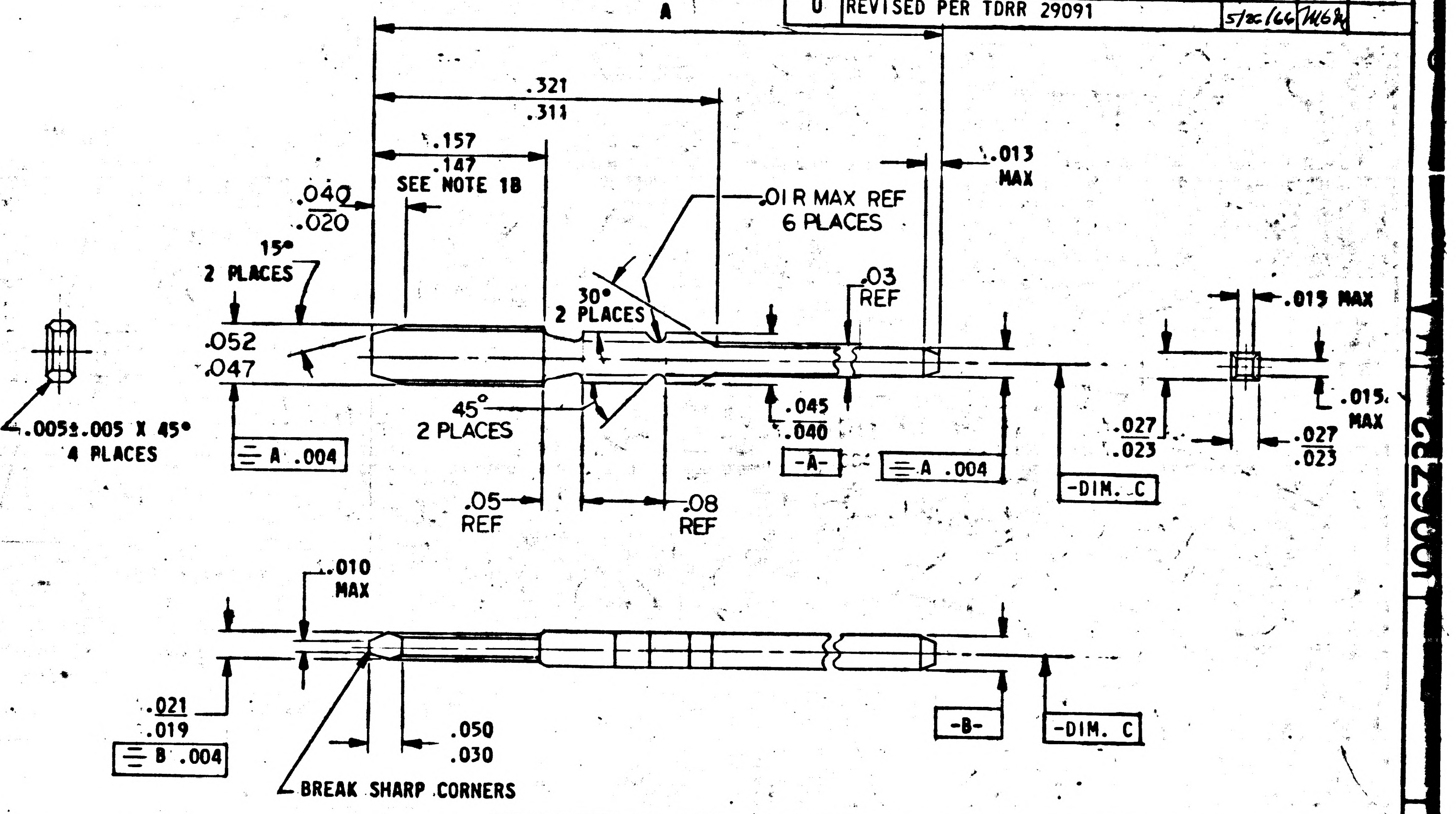
   - E. SYMMETRY: PART MAY BE RESTRAINED DURING MEASUREMENT.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. PRESERVATION PACKAGING, AND CONTAINER MARKING, PER ND 1002215, CLASS 1, CODE 3.



DASH NO.	DIM. A	MATERIAL	DIM. C
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3	.555 .545	NICKEL	.010
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7	1.612 1.602	NICKEL	.020
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~~12~~	~~2.500~~ ~~2.490~~	~~NICKEL~~	

DASH NO.	DIM. A	MATERIAL	
13	.793 .783	NICKEL	
14	2.425 2.415	BRASS	

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MASTER

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LIST OF MATERIALS			

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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Marton
APPROVAL Duggan
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

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REVISIONS				
SYM	DESCRIPTION	CHANGE NO	APPD	DATE
V	REVISED PER TDRR 30582 ;		538 JL	18 AUG 66

V 1006782

SYM	DESCRIPTION	DATE	APPROVAL	
	REVISIONS TDRR 00189 12·20·62			
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63		WK
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L	REVISED PER TDRR 10267	6/24/64		WK
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U	REVISED PER TDRR 29091	5/26/66		

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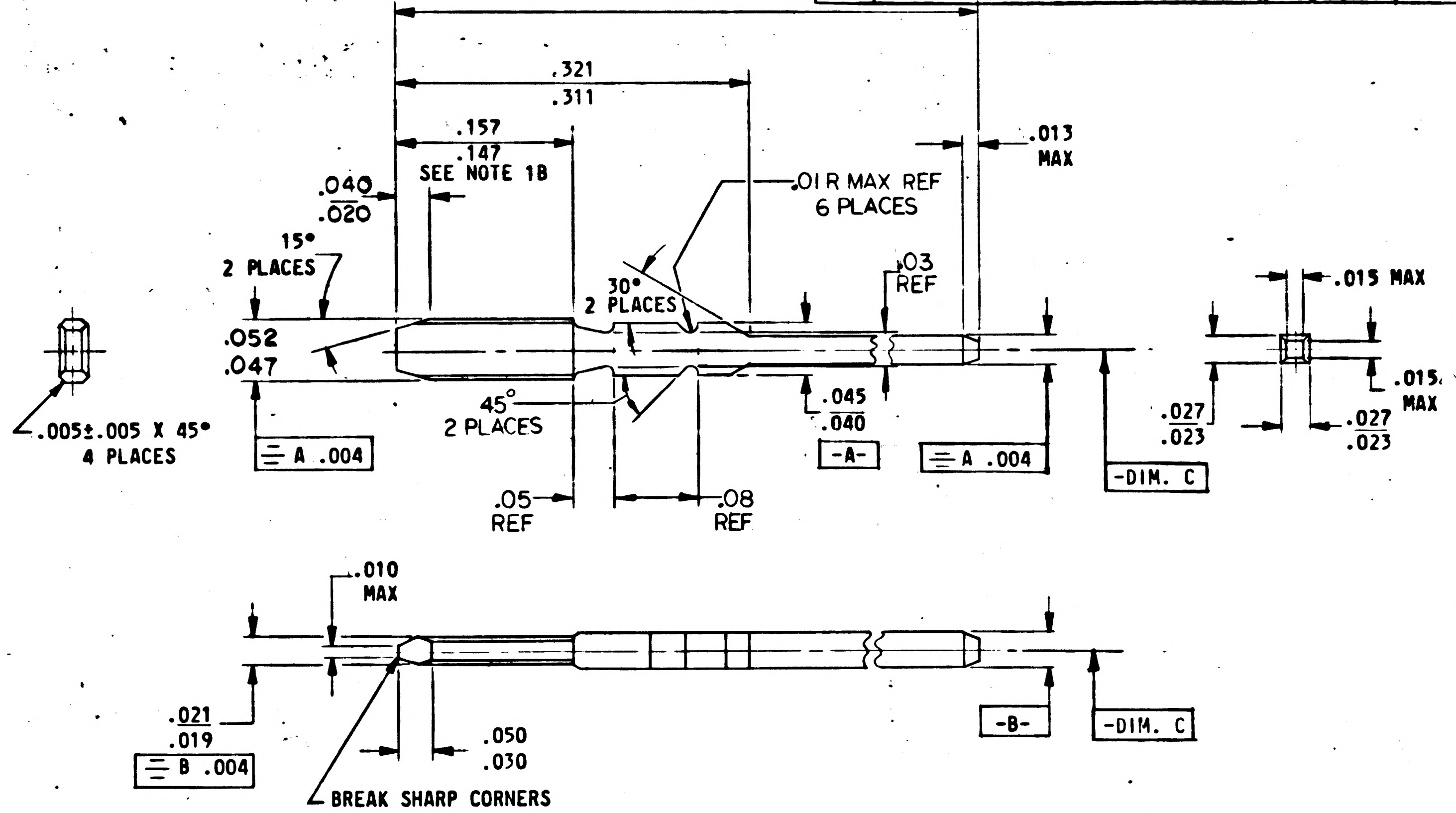
3. PRESERVATION PACKAGING, AND CONTAINER MARKING, PER ND 1002215, CLASS I, CODE 3.



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~~12~~	~~2.500~~ ~~2.490~~	~~NICKEL~~	

DASH NO.	DIM. A	MATERIAL	DIM. C
13	.793 .783	NICKEL	.010
14	2.425 2.415	BRASS	.031
15	.723 .713	NICKEL	

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HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Morton
APPROVAL Duggan
NASA APPROVAL 12·20·62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006782
SCALE NONE WT SHEET 1 OF 1

1006782 V

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REVISIONS

SYM	DESCRIPTION	CHANGE NO	APP'D	DATE
V	REVISED PER TDRR 30582		JJB II	18 AUG 66
W	REVISED PER TDRR 32217		TD NW	9 DEC 66

W 1006782

REVISIONS TDRR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1-23-63		WK
B	REVISED PER TDRR 00350	2-1-63		WK
C	REVISED PER TDRR 00561	3-13-63		WK
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H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428			WK
K	REVISED PER TDRR 08007	28 APR 64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 12307	9-1-64		
N	REVISED PER TDRR 17916		WK	
P	REVISED PER TDRR 18749		WK	
R	REVISED PER TDRR 21588	8/24/65		
S	REVISED PER TDRR 25133	1/18/66	WK	
T	REVISED PER TDRR 27404	3/21/66	WK	
U	REVISED PER TDRR 29091	5/26/66		

NOTES:

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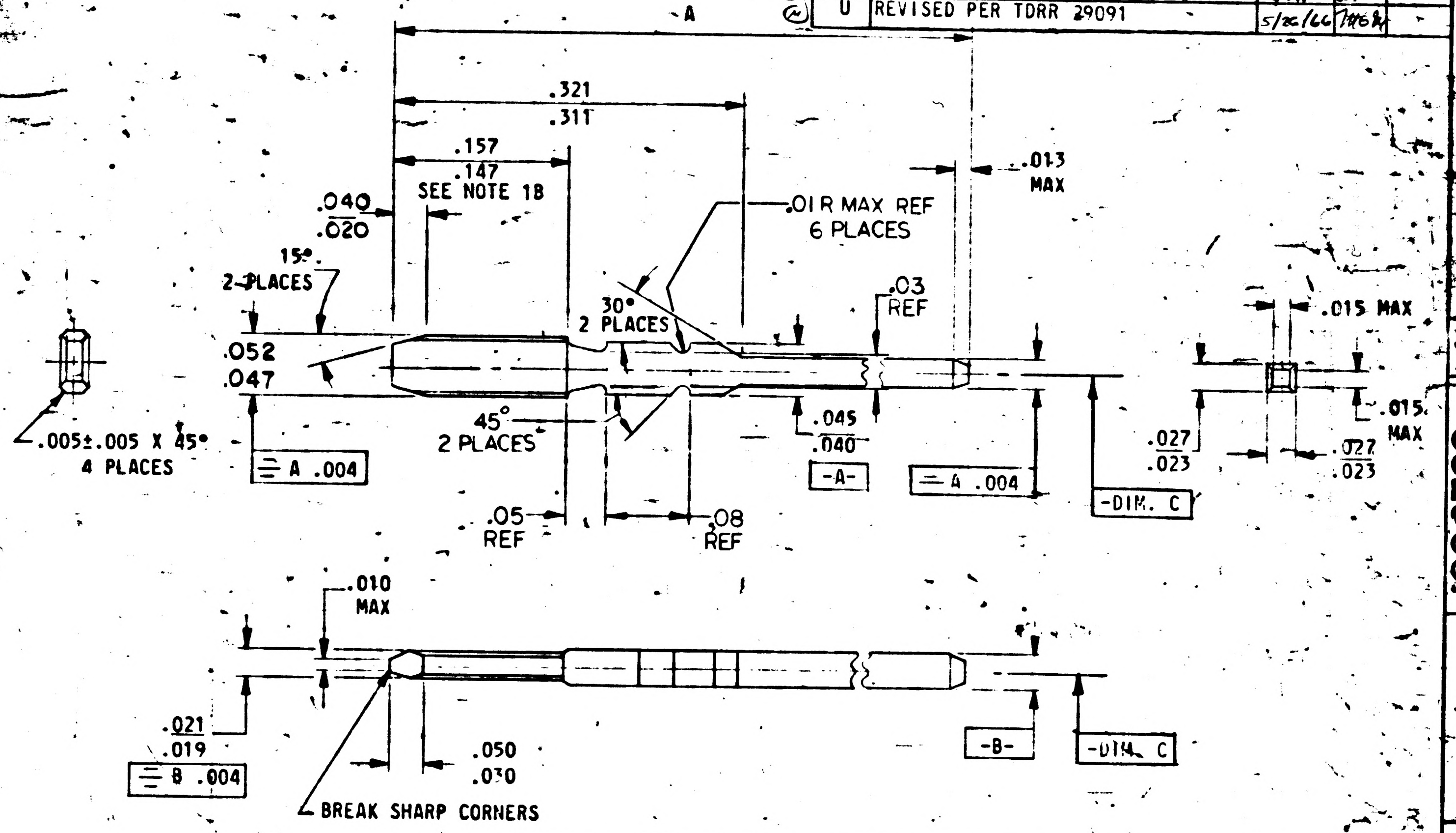

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16	2.375 2.365	BRASS	.031

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LIST OF MATERIALS			

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MATERIAL: SEE NOTES
HEAT TREATMENT: SEE NOTES
FINAL FINISH: SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED 14 DEC 62
APPROVAL Joe Norton
APPROVAL
NASA APPROVAL 1/2 2007
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
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CONTACT, WRAPOST-MALE, MINIATURE
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SYM	DESCRIPTION	CHANGE NO	APPD	DATE
V	REVISED PER TDRR 30582		JJB / JI	15 AUG 66
W	REVISED PER TDRR 32217		TD / NW	9 DEC 66

M 1006782

REVISIONS TDRR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL	
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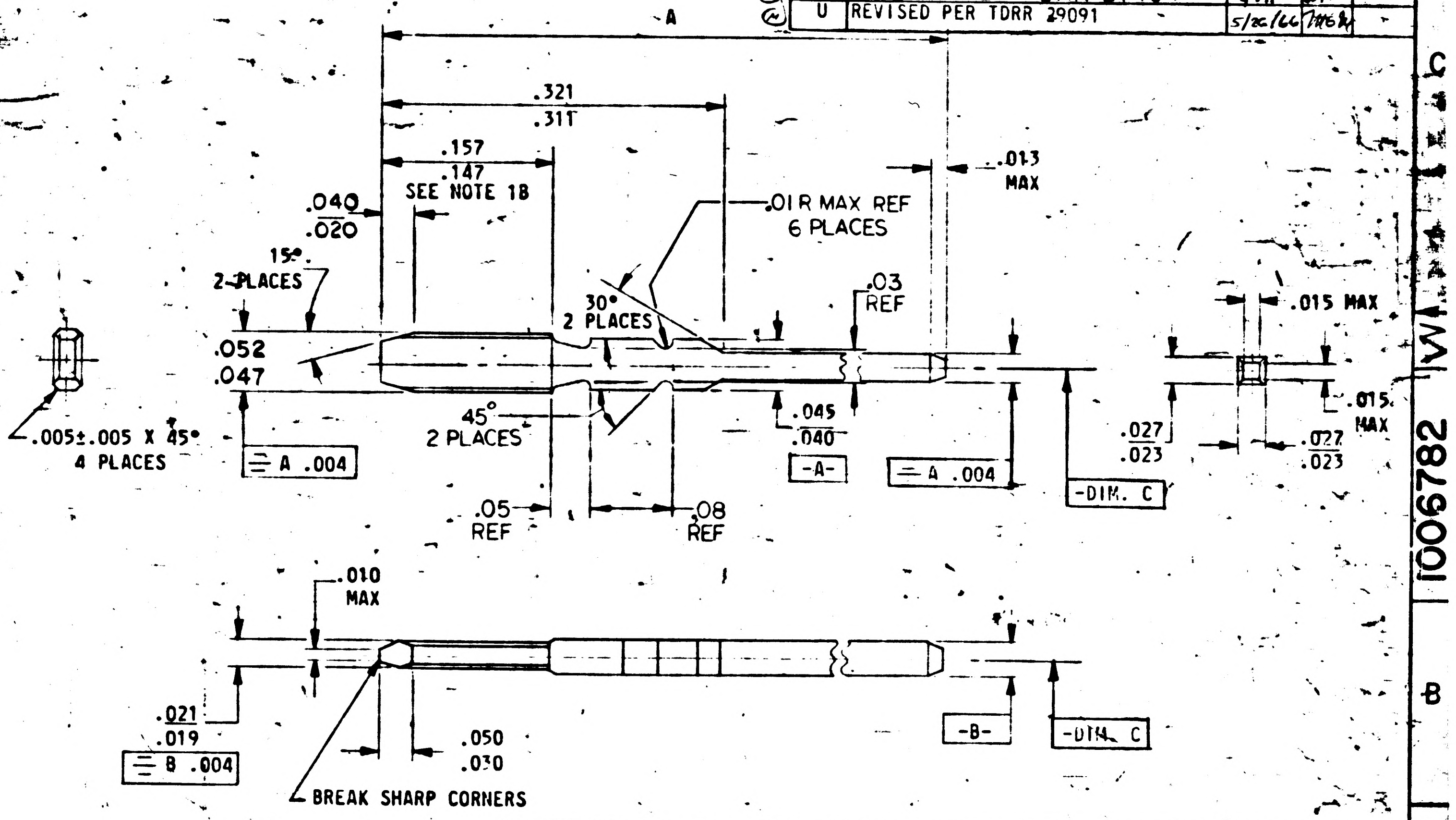

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4	1.317 1.307	NICKEL	.020
5	1.412 1.402	NICKEL	.020
6	.460 .450	NICKEL	.010
7	1.612 1.602	NICKEL	.020
8	1.070 1.060	NICKEL	.020
9	2.500 2.490	BRASS	.031
10	2.475 2.465	BRASS	.031
11	1,161 1,151	NICKEL	.020
~~12~~	~~2.500~~ ~~2.490~~	~~NICKEL~~	

DASH NO.	DIM. A	MATERIAL	DIM. C
13	.793 .783	NICKEL	.010
14	2.425 2.415	BRASS	.031
15	.723 .713	NICKEL	.010
16	2.375 2.365	BRASS	.031

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND. NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT SEE NOTES

FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED 14 DEC 62
APPROVAL
APPROVAL

NASA APPROVAL 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

1006782

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006782

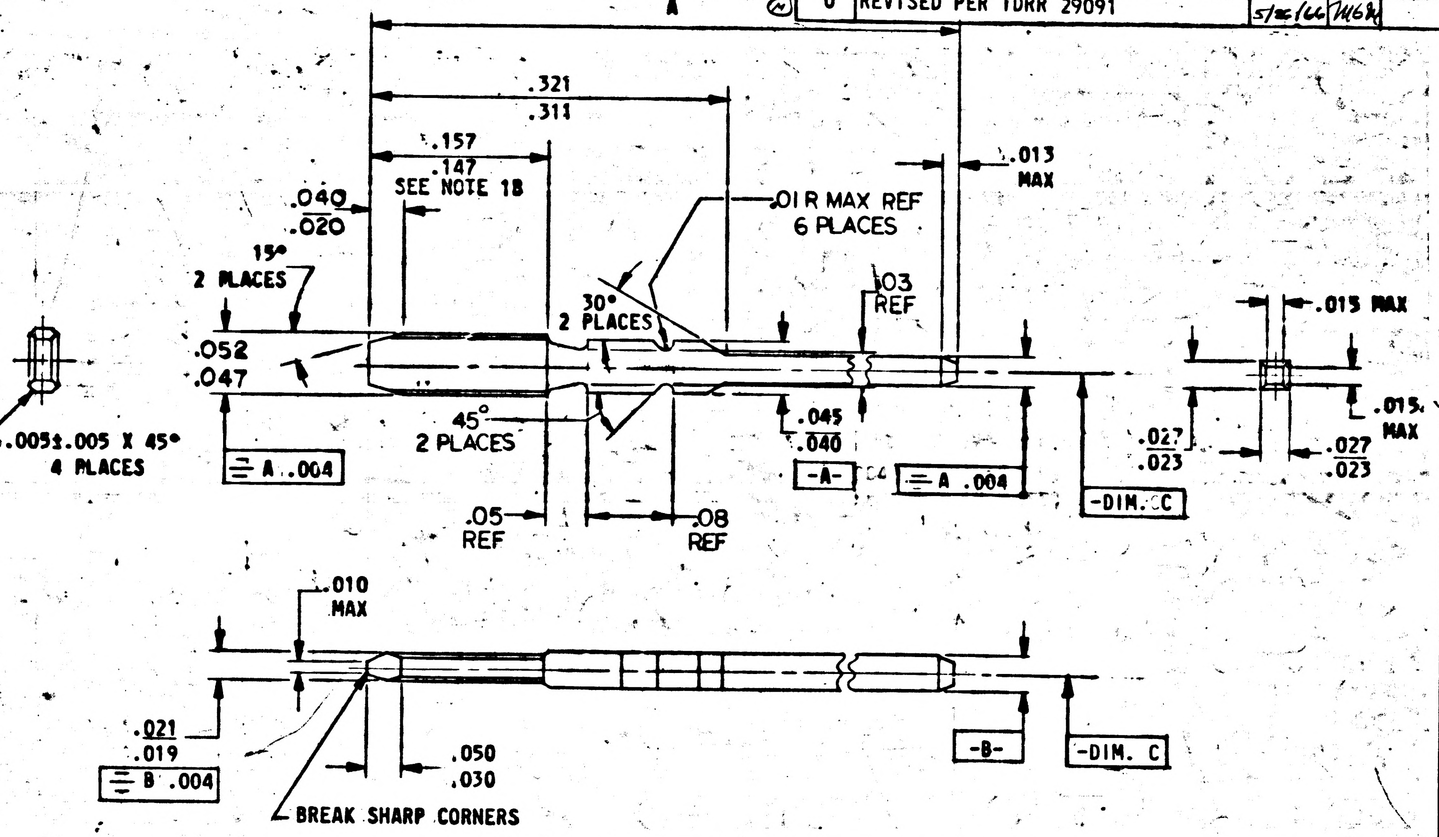
REVISIONS				
SYM	DESCRIPTION	CHANGE NO	APPD	DATE
V	REVISED PER TDRR 30582		JJB JL	18 AUG 66
W	REVISED PER TDRR 32217.		TD NW	9 DEC 66
Y	REVISED PER TDRR 32219.		TD NW	9 DEC 66

REVISIONS TDRR 00189 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL	
—	ORIGINATED	—	—	
A	REVISED PER TDRR 00290	1·23·63		WK
B	REVISED PER TDRR 00350	2·6·63	DCT	WK
C	REVISED PER TDRR 00561	3·13·63		WK
D	REVISED PER TDRR 01164	5-8-63		WR
E	REVISED PER TDRR 02392	8/7/63		JH
F	REVISED PER TDRR 02817	8/28/63		DW
G	REVISED PER TDRR 03513	30ct63		WK
H	REVISED PER TDRR 04695	11/26/63		WK
J	REVISED PER TDRR 06428	26Feb64		WK
K	REVISED PER TDRR 08007	28APR64	WK	WK
L	REVISED PER TDRR 10267	6/24/64		WK
M	REVISED PER TDRR 12307	9·1·64		
N	REVISED PER TDRR 17916		WK	
P	REVISED PER TDRR 18749		WK	
R	REVISED PER TDRR 21588	8/24/65	WK	
S	REVISED PER TDRR 25133	1/18/66	WK	
T	REVISED PER TDRR 27404		WK	
U	REVISED PER TDRR 29091	5/26/66	MG	

NOTES:

1. REQUIREMENTS:
   MATERIAL: (SEE TABLE)
   A. (1) NICKEL (INTERNATIONAL NICKEL CO. HUNTINGTON ALLOY #200, HALF HARD, HARDNESS ROCKWELL "B" 75-90. (HARDNESS OF STRIP FROM WHICH PARTS ARE FABRICATED.)
   (2) BRASS PER QQ-B-613 COMPOSITION 2, SPRING (BASE MATERIAL BEFORE MANUFACTURING)
   B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA
   C. A STRIP OF MATERIAL AND A CERTIFICATE OF COMPLIANCE AND MATERIAL LOT CONTROL NUMBER WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY THE FIRST SHIPMENT OF PARTS FROM EACH MATERIAL LOT. EACH SUCCEEDING SHIPMENT OF PARTS FROM THE SAME MATERIAL LOT SHALL HAVE A CERTIFICATE OF COMPLIANCE AND LOT CONTROL NUMBER.
   D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND1015404 CLASS 3.
   E. SYMMETRY: PART MAY BE RESTRAINED DURING MEASUREMENT.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. PRESERVATION PACKAGING, AND CONTAINER MARKING, PER ND 1002215, CLASS I, CODE 3.



DASH NO.	DIM. A	MATERIAL	DIM. C
1	.413 .403	NICKEL	.010
2	.843 .833	NICKEL	.010
3	.555 .545	NICKEL	.010
4	1.317 1.307	NICKEL	.020
5	1.412 1.402	NICKEL	.020
6	.460 .450	NICKEL	.010
7	1.612 1.602	NICKEL	.020
8	1.070 1.060	NICKEL	.020
9	2.500 2.490	BRASS	.031
10	2.475 2.465	BRASS	.031
11	1.161 1.151	NICKEL	.020
~~12~~	~~2.500~~ ~~2.490~~	~~NICKEL~~	

DASH NO.	DIM. A	MATERIAL	DIM. C
13	.793 .783	NICKEL	.010
14	2.425 2.415	BRASS	.031
15	.723 .713	NICKEL	.010
16	2.375 2.365	BRASS	.031
17	1.255 1.245	NICKEL	.020

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED Maynard 14 DEC 62
APPROVAL Joe Martin
APPROVAL J Duggan
NASA APPROVAL WJ Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

1006782

Z 1006782

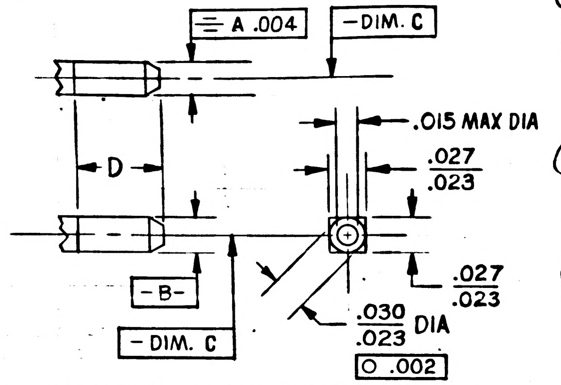
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS				
SYM	DESCRIPTION	CHANGE NO	APPD	DATE
V	REVISED PER TDRR 30582		JJB / JI	18 AUG 66
W	REVISED PER TDRR 32217.		TD / N.W.	9 DEC 66
Y	REVISED PER TDRR 32219.		TD / N.W.	9 DEC 66
Z	REVISED PER TDRR 34766		JS / RW	4 OCT 67

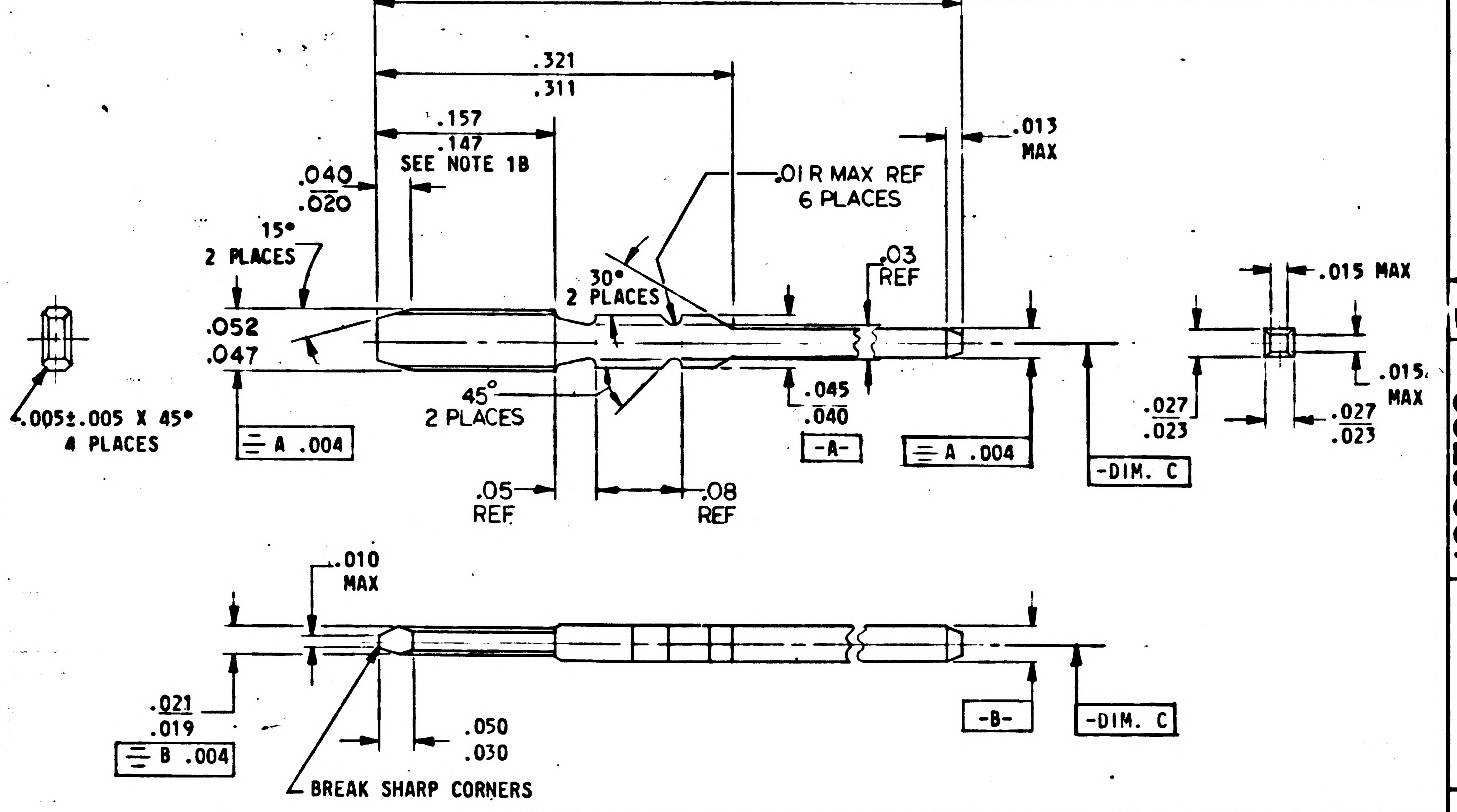
REVISIONS TDRR 00169 12·20·62			
SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—
A	REVISED PER TDRR 00290	1·23·63	WK
B	REVISED PER TDRR 00350	2·6·63	WK
C	REVISED PER TDRR 00561	3-13-63	WK
D	REVISED PER TDRR 01164	5-8-63	WK
E	REVISED PER TDRR 02392	8/7/63	
F	REVISED PER TDRR 02817	8/28/63	
G	REVISED PER TDRR 03513	3 Oct 63	WK
H	REVISED PER TDRR 04695	11/26/63	WK
J	REVISED PER TDRR 06428	26 Feb 64	WK
K	REVISED PER TDRR 08007	28 APR 64	WK WK
L	REVISED PER TDRR 10267	6/24/64	WK
M	REVISED PER TDRR 12307	9·1·64	
N	REVISED PER TDRR 17916	4/21/65	WK
P	REVISED PER TDRR 18749		WK
R	REVISED PER TDRR 21588	8/24/65	WK
S	REVISED PER TDRR 25133	1/18/66	WK
T	REVISED PER TDRR 27404	3/29/66	WK
U	REVISED PER TDRR 29091	5/20/66	

NOTES:

1. REQUIREMENTS:
   MATERIAL: (SEE TABLE)
   - A. (1) NICKEL (INTERNATIONAL NICKEL CO., HUNTINGTON ALLOY #200, HALF HARD, HARDNESS ROCKWELL "B" 75-90. (HARDNESS OF STRIP FROM WHICH PARTS ARE FABRICATED.)
     (2) BRASS PER QQ-B-613 COMPOSITION 2, SPRING (BASE MATERIAL BEFORE MANUFACTURING)
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II AT CONTACT AREA
   - C. A STRIP OF MATERIAL AND A CERTIFICATE OF COMPLIANCE AND MATERIAL LOT CONTROL NUMBER WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY THE FIRST SHIPMENT OF PARTS FROM EACH MATERIAL LOT. EACH SUCCEEDING SHIPMENT OF PARTS FROM THE SAME MATERIAL LOT SHALL HAVE A CERTIFICATE OF COMPLIANCE AND LOT CONTROL NUMBER.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND1015404 CLASS 3.
   - E. SYMMETRY: PART MAY BE RESTRAINED DURING MEASUREMENT.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. PRESERVATION PACKAGING, AND CONTAINER MARKING, PER ND 1002215, CLASS I, CODE 3.



VIEW SHOWN FOR -18 & -19 ONLY



DASH NO.	DIM. A	MATERIAL	DIM. C	DIM D
1	.413 .403	NICKEL	.010	—
2	.843 .833	NICKEL	.010	—
3	.555 .545	NICKEL	.010	—
4	1.317 1.307	NICKEL	.020	—
5	1.412 1.402	NICKEL	.020	—
6	.460 .450	NICKEL	.010	—
7	1.612 1.602	NICKEL	.020	—
8	1.070 1.060	NICKEL	.020	—
9	2.500 2.490	BRASS	.031	—
10	2.475 2.465	BRASS	.031	—
11	1,161 1,151	NICKEL	.020	—
~~12~~	~~2.500~~ ~~2.490~~	~~NICKEL~~		—

DASH NO.	DIM. A	MATERIAL	DIM. C	DIM D
13	.793 .783	NICKEL	.010	—
14	2.425 2.415	BRASS	.031	—
15	.723 .713	NICKEL	.010	—
16	2.375 2.365	BRASS	.031	—
17	1.255 1.245	NICKEL	.020	—
18	.843 .833	NICKEL	.010	.470 MIN.
19	1.100 1.090	NICKEL	.020	.315 .345

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray W Keeler DATE 4 Dec 62
CHECKED A Maynard 14 DEC 62
APPROVAL Joe Martin
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, WRAPOST-MALE, MINIATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006782

SCALE NONE WT SHEET 1 OF 1

Z 1006782

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

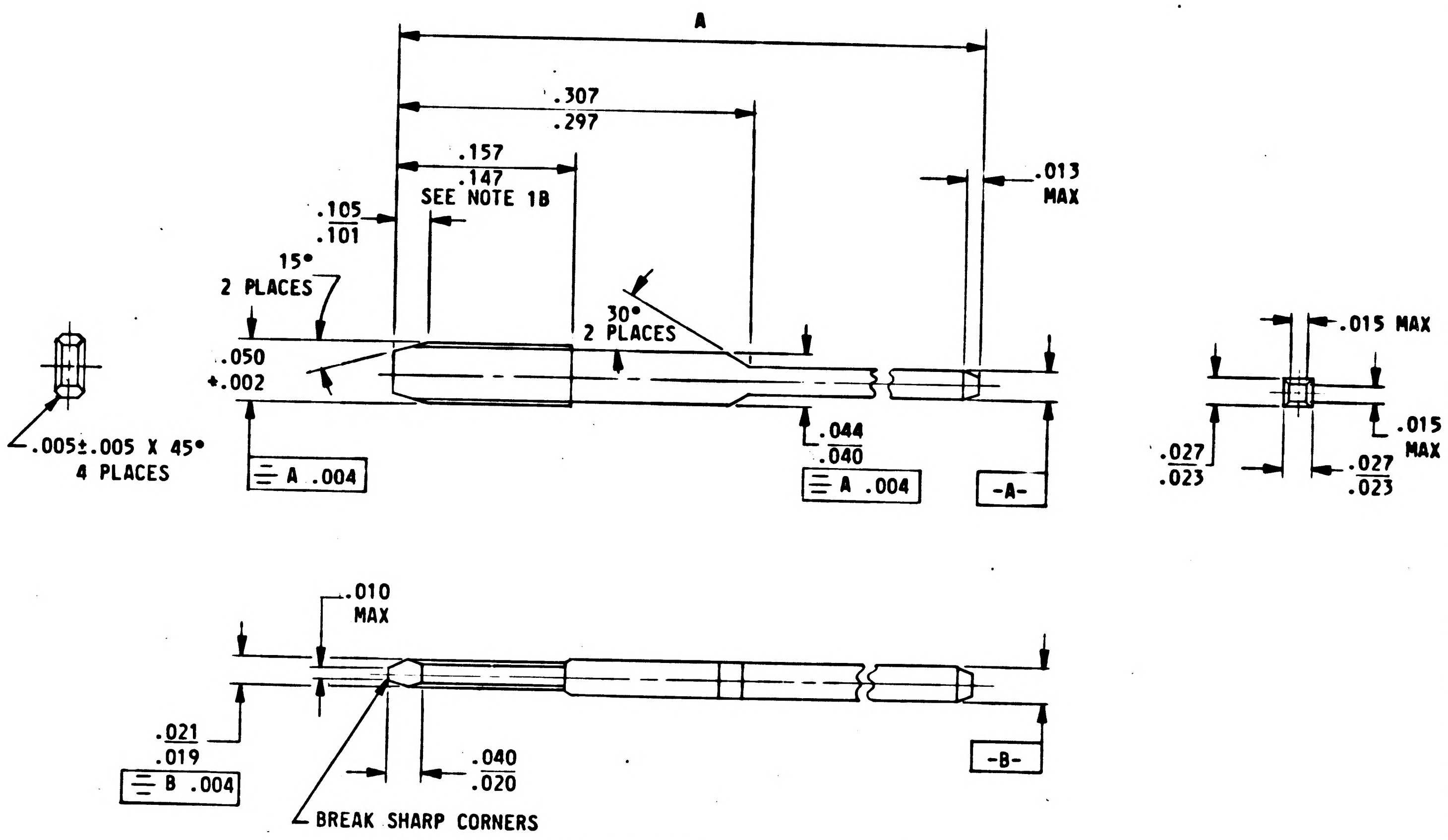
1006782

REVISIONS TORR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
—	ORIGINATED	—	—

NOTES:

1. REQUIREMENTS:
   - A. MATERIAL: BERYLLUIM COPPER PER FEDERAL SPECIFICATION QQ-C-533.
   - B. FINISH: GOLD PLATING, .000050 MINIMUM THICKNESS PER MIL-G-45204, TYPE II OVER SILVER PLATE PER QQ-S-365, .0002 MINIMUM THICKNESS, AT CONTACT AREA.
   - C. HEAT TREATMENT: PER MIL-H-7199, ROCKWELL 36C MINIMUM.
   - D. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.



DASH NO.	DIM A	MALCO PART NO.
1	.468 .458	
2	.843 .833	5190005

ORIGINAL SOURCE OF SUPPLY:

MALCO MANUFACTURING COMPANY
CHICAGO, ILLINOIS
CODE IDENT NO. 91886

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT SEE NOTES
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 4 Dec 62
CHECKED H. Maynard 14 DEC 62
APPROVAL Joe Martin
APPROVAL D. Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 1962

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT,
WRAPOST-MALE, MINIATURE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006782
SCALE NONE
WT
SHEET 1 OF 1

1006782

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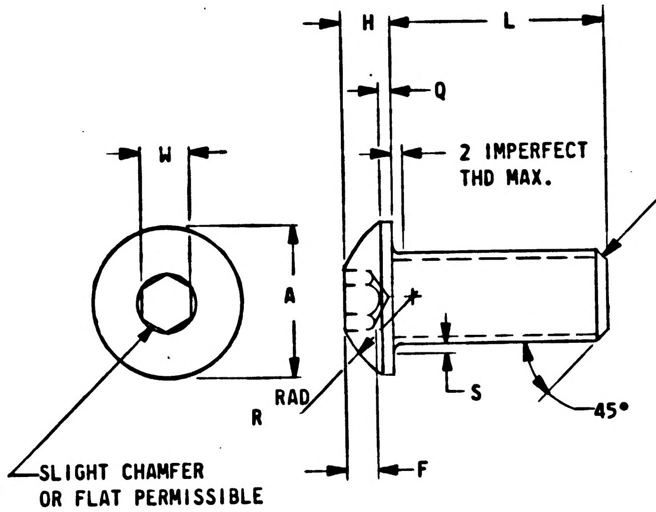
1006783	A

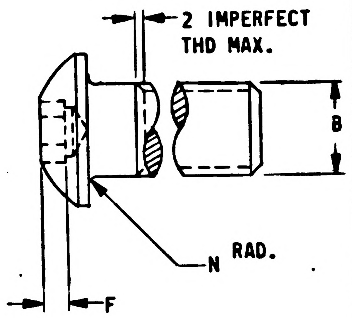
REVISIONS TDRR 00189 -12-20-62			
SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10 Apr 63	WK.

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

SCREW SIZE	A	B	F MIN	H	L MAX	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021


H
L
Q
2 IMPERFECT THD MAX.
W
A
CHAMFER TO BELOW ROOT OF THD.
R RAD
S
45°
F
SLIGHT CHAMFER OR FLAT PERMISSIBLE



OPTIONAL MACHINE BROACH

A	A
REV-	REV-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Bay Wheeler DATE 17 Dec 62
CHECKED K. Maynard 19 DEC. 62
APPROVAL
APPROVAL 19-Dec 62
NASA APPROVAL W J Rhine 9-2-2002
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006783 A Ⓝ

REVISIONS TDRR 00[illegible] 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Apr 63	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/6-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED A. Maynard 19 DEC '62
APPROVAL [illegible] Marton
APPROVAL [illegible] 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006783 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

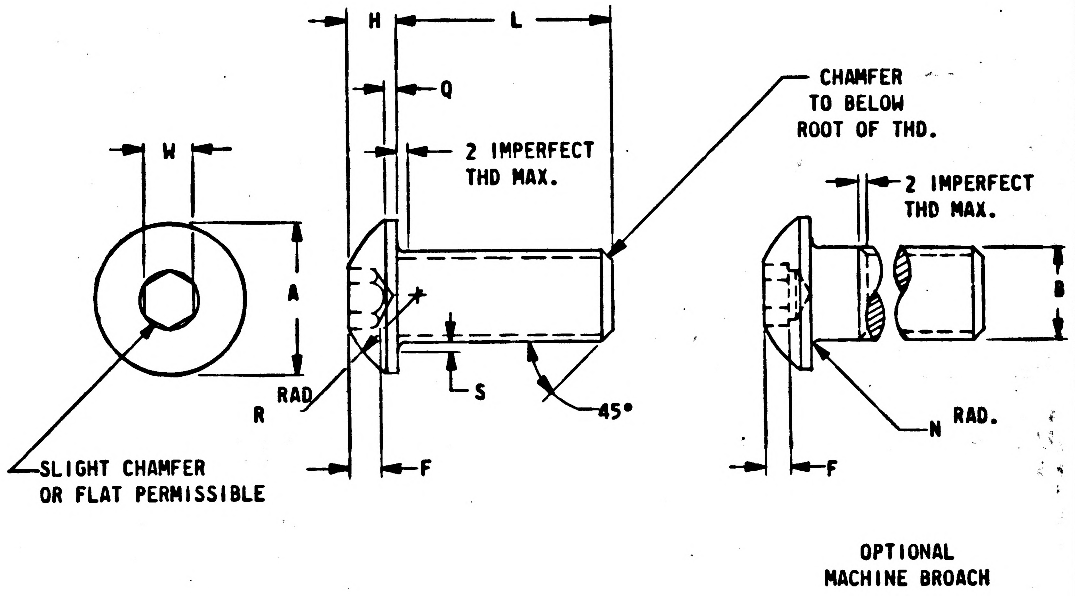
1006783 B

REVISIONS TDRR 00189 -12-20-62			
SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ -	TAKEN FROM BUWEPS DWG 2318873		
Ⓜ A	REVISED PER TDRR 00807	10 Apr 63	W.K.
B	REVISED PER TDRR 01273	5-15-63	W.K.

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN [illegible] DOCUMENT ND 1015404 CLASS 3.I.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



B	B
A	A
REV-	REV-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED Maynard 19 DEC 62
APPROVAL
APPROVAL 19-Dec-62

NASA APPROVAL W J Rhine 2-2-63
MIT APPROVAL 2 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006783
SCALE NONE | WT | SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006783

REVISIONS TORR 00149 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	[illegible]63	WK
B	REVISED PER TDRR 01273	5-15-63	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	-NON STANDARD
95	4/40NC-3A	5/16	-94C-05

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL [illegible]
APPROVAL [illegible] 19 Dec 62
NASA APPROVAL W.J. Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006783 C

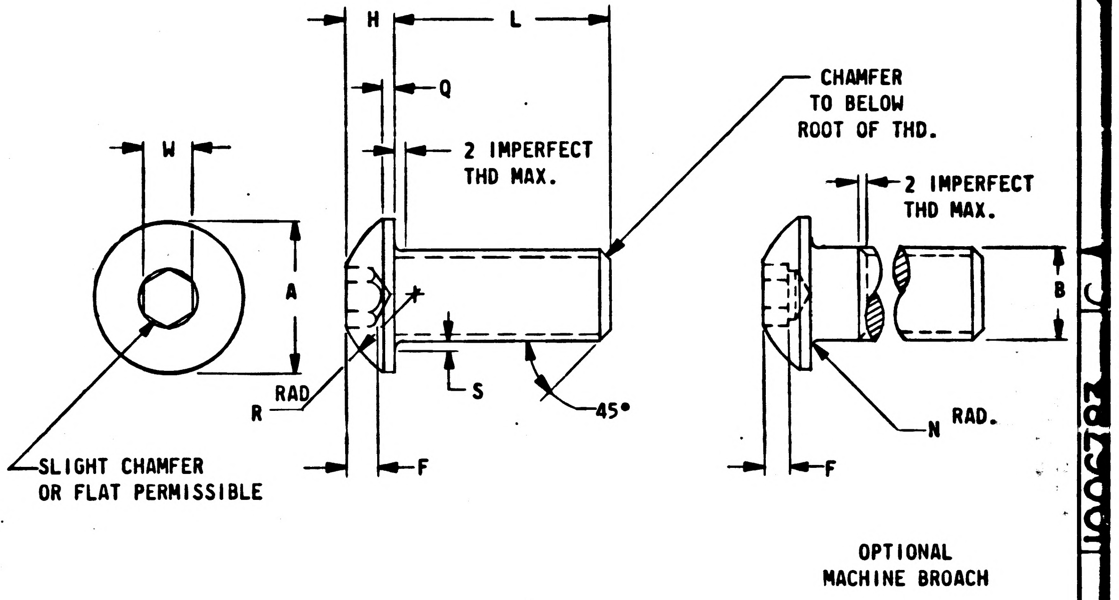
REVISIONS TDRR 00189 -12.20.62

SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10 Apr 63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5 Sep 63	WK

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404 CLASS 3.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



C	C
B	B
A	A
REV-	REV-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED [illegible] 19 DEC '62
APPROVAL [illegible]
APPROVAL [illegible] 19-Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006783
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

C 1006783

REVISIONS TDRR 00149 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10Apr63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5Aug63	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	-NON STANDARD
95	4/40NC-3A	5/16	-94C-05
96	4/40NC-3A	1-1/4	38031-94C-20

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL J. Morton
APPROVAL D. Hoag 19 Dec 62
NASA APPROVAL W.J. Rhine 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006783 D

REVISIONS TDRR 00189 -12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
(M) -	TAKEN FROM BUWEPS DWG 2318873		
(M) A	REVISED PER TDRR 00807	10 Apr 63	WK.
(M) B	REVISED PER TDRR 01273	5-15-63	WK.
(M) C	REVISED PER TDRR 02899	5 Aug 63	WK
D-	REVISED PER TDRR 0339 2	9/26/67	[illegible]

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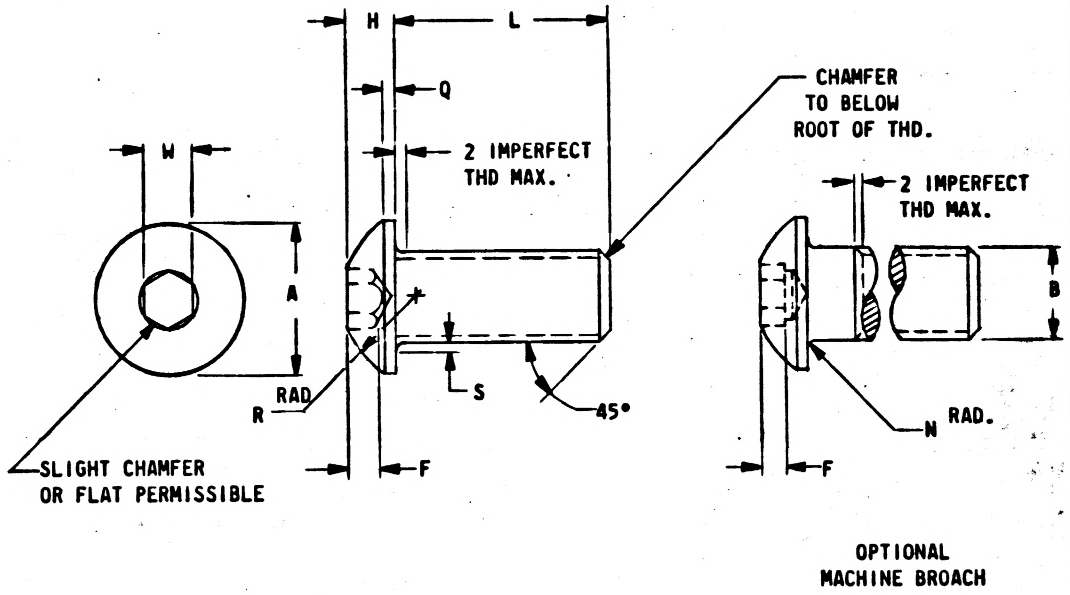
NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN [illegible] ND 1015404 CLASS 3.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



D	D
C	C
B	B
A	A
REV-	REV-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Roy Wheeler DATE 17 Dec 62
CHECKED V. Maynard 19 DEC '62
APPROVAL
APPROVAL 19-Dec
NASA APPROVAL W J Rhine 9-2-2002
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006783
SCALE NONE | WT | SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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D 1006783

REVISIONS TDRR 00149 12·20·62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Ap 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	6 Aug 63	WK
D	REVISED PER TDRR 03392	9/26/63	

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/$_{56}$NC-3A	1/8	-92C-02
94	2/$_{56}$NC-3A	13/16	-NON STANDARD
95	4/$_{40}$NC-3A	5/16	-94C-05
96	4/ 40NC-3A	1-1/4	38031-94C-20

DASH NO	THREAD	LENGTH	VENDOR PART NO.
97	1/4-20UNC-3A	3-1/2	38031-4C-56

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL Jos Marton
APPROVAL 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

E 1006783

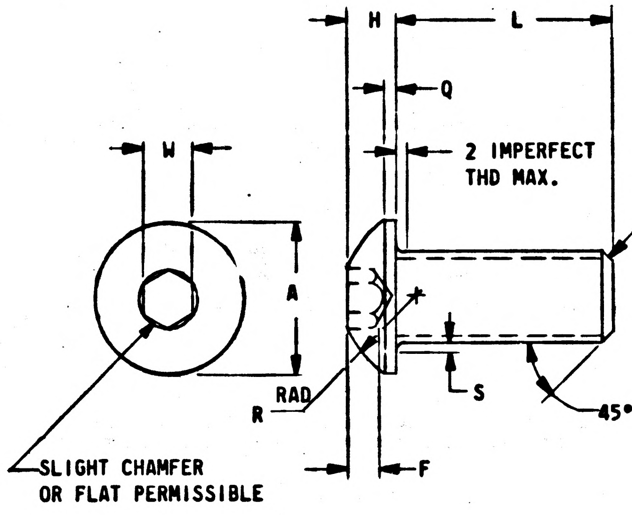
REVISIONS TDRR 00189 -12.20.62

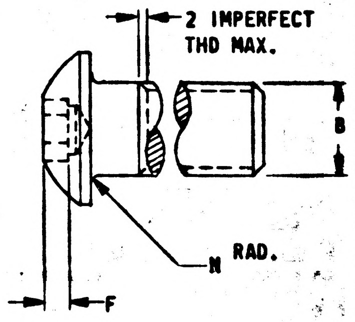
SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10 Apr 63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5 Sep 63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8 Oct 63	WK

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN [illegible] ND 1015404 CLASS 3.[illegible]
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021


W
A
H
L
Q
2 IMPERFECT THD MAX.
CHAMFER TO BELOW ROOT OF THD.
RAD
R
S
45°
F
SLIGHT CHAMFER OR FLAT PERMISSIBLE



OPTIONAL MACHINE BROACH

E	E
D	D
C	C
B	B
A	A
REV-	REV-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

ORIGINAL SOURCE OF SUPPLY:
INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Gary Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL
APPROVAL 19-Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, BUTTON HEAD, HEX SOCKET SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

1006783

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006783 E

REVISIONS TDRR 00149 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 [illegible] 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5 [illegible] 63	WK
D	REVISED PER TDRR 03392	9/26/63	[illegible]
E	REVISED PER TDRR 03706	8 [illegible] 63	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	-NON STANDARD
95	4/40NC-3A	5/16	-94C-05
96	4/40NC-3A	1-1/4	38031-94C-20

DASH NO	THREAD	LENGTH	VENDOR PART NO.
97	1/4-20UNC-3A	3-1/2	38031-4C-56
98	2-56NC-3A	11/16	38031-92C-11

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ben Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL
APPROVAL 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT.
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006783

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F 1006783

SYM	REVISIONS TDRR 00189 -12-26-62 DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10Apr63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5Aug63	WK
D	REVISED PER TDRR 03392	9/26/63	[illegible]
E	REVISED PER TDRR 03706	8Oct63	WK
F	REVISED PER TDRR 06244	2-18-64	WK

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS 3.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY & EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND NUMBER OF PIECES. THE SUPPLIERS NAME MAY APPEAR ON THE PACKAGE.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
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5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
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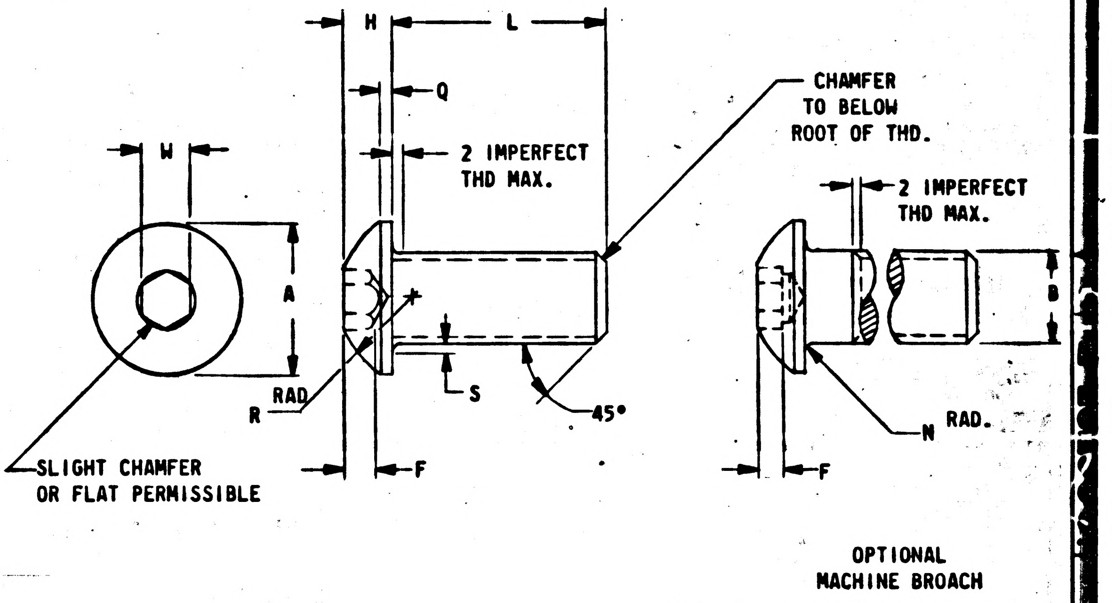
H
L
Q
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2 IMPERFECT THD MAX.
CHAMFER TO BELOW ROOT OF THD.
2 IMPERFECT THD MAX.
A
B
RAD
R
S
45°
N
RAD.
F
F
SLIGHT CHAMFER OR FLAT PERMISSIBLE

OPTIONAL MACHINE BROACH

F	F
E	E
D	D
C	C
B	B
A	A
REV-	REV-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED [illegible] Maynard 19 DEC '62
APPROVAL [illegible]
APPROVAL [illegible] 19-Dec-62
NASA APPROVAL W J Rhine 1-2-2002
MIT APPROVAL [illegible] 2 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006783
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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F 1006783

REVISIONS TDRR 00149 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Apr 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5 Aug 63	wk
D	REVISED PER TDRR 03392	9/26/63	[illegible]
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	1-18-64	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	-NON STANDARD
95	4/40NC-3A	5/16	-94C-05
96	4/40NC-3A	1-1/4	38031-94C-20
97	1/4-20UNC-3A	3-1/2	38031-4C-56
98	2-56NC-3A	11/16	38031-92C-11
99	4-40NC-3A	7/8	38031-94C-14

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED A. Maynard 19 DEC '62
APPROVAL [illegible] Morton
APPROVAL [illegible] 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT.
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

G 1006783

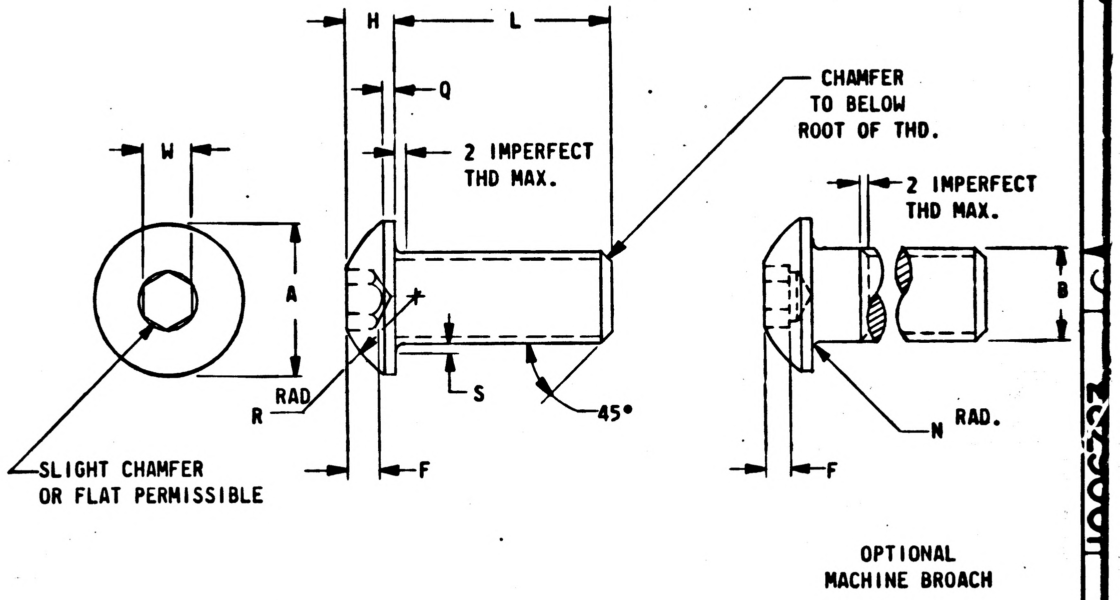
REVISIONS TDRR 00189 -12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10 Apr 63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5 Aug 63	WK
D	REVISED PER TDRR 03392	9/26/63	[illegible]
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404 CLASS 3.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY & EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND NUMBER OF PIECES. THE SUPPLIERS NAME MAY APPEAR ON THE PACKAGE.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL
APPROVAL 19-Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006783 G

REVISIONS TDRR 00619 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10Apr63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5Sep63	WK
D	REVISED PER TDRR 03392	9/26/63	[illegible]
E	REVISED PER TDRR 03706	8Oct63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1. 4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	-NON STANDARD
95	4/40NC-3A	5/16	-94C-05
96	4/ 40NC-3A	1-1/4	38031-94C-20
97	1/4-20UNC-3A	3-1/2	38031-4C-56
98	2-56NC-3A	11/16	38031-92C-11
99	4-40NC-3A	7/8	38031-94C-14
100	4-40NC-3A	7/16	— — — — —

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL [illegible] Martin
APPROVAL [illegible] 19 Dec 62
NASA APPROVAL W.J. Rhine 12-20-62
MIT APPROVAL [illegible] 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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H 1006783

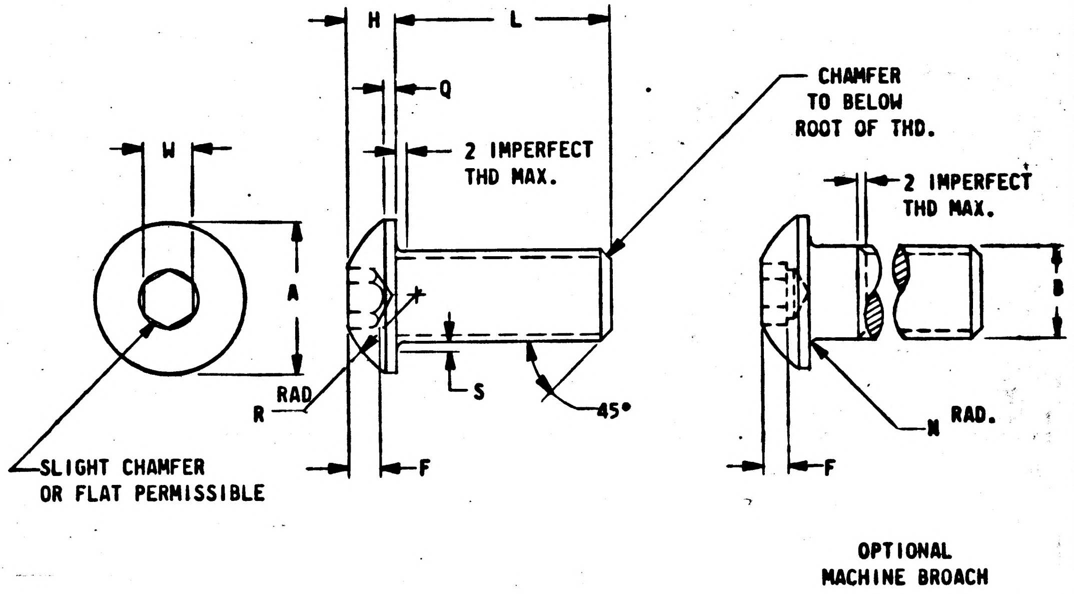
REVISIONS TDRR 00189 -12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10 Apr 63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5 Sep 63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	1/21/65	WK

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404 CLASS 3.
   - H. UNLESS OTHERWISE SPECIFIED, SCREWS SHALL MEET THE REQUIREMENTS OF FF-S-86 TYPE VIII
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY & EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND NUMBER OF PIECES. THE SUPPLIERS NAME MAY APPEAR ON THE PACKAGE.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Roy Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC 62
APPROVAL
APPROVAL 19-Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

H | 1006783

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 00149 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Apr 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5 Sep 63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	-NON STANDARD
95	4/40NC-3A	5/16	-94C-05
96	4/40NC-3A	1-1/4	38031-94C-20

DASH NO	THREAD	LENGTH	VENDOR PART NO.
97	1/4-20UNC-3A	3-1/2	38031-4C-56
98	2-56NC-3A	11/16	38031-92C-11
99	4-40NC-3A	7/8	38031-94C-14
100	4-40NC-3A	7/16	— — — — —

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL Martin
APPROVAL Duggan 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

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J 1006783

REVISIONS TDRR 00189 -12-20-62			
SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10 Apr 63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5 Jy 63	WK
D	REVISED PER TDRR 03392	7/26/63	
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK.

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404 CLASS 3.
   - H UNLESS OTHERWISE SPECIFIED, SCREWS SHALL MEET THE REQUIREMENTS OF FF-S-86 TYPE VIII
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY & EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND NUMBER OF PIECES. THE SUPPLIERS NAME MAY APPEAR ON THE PACKAGE.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W NOM	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
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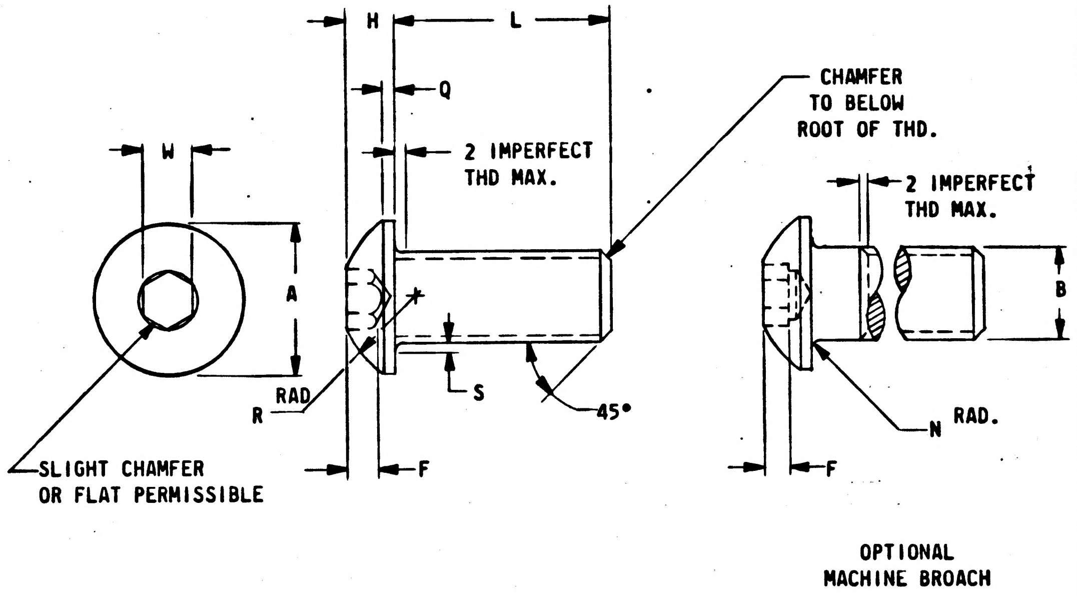
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED R. Maynard 19 DEC 62
APPROVAL
APPROVAL 19-Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

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J 1006783

REVISIONS TDRR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Apr 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5 Sep 63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	1-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK

DASH NO.	THREAD	LENGTH
1	0-80NF-3A	1/8
2	0-80NF-3A	3/16
3	0-80NF-3A	1/4
4	0-80NF-3A	3/8
5	1-72NF-3A	1/8
6	1-72NF-3A	3/16
7	1-72NF-3A	1/4
8	1-72NF-3A	3/8
9	2-56NC-3A	3/16
10	2-56NC-3A	1/4
11	2-56NC-3A	11/32
12	2-56NC-3A	3/8
13	2-56NC-3A	1/2
14	3-48NC-3A	3/16
15	3-48NC-3A	1/4
16	3-48NC-3A	3/8
17	3-48NC-3A	1/2
18	4-40NC-3A	1/4
19	4-40NC-3A	3/8
20	4-40NC-3A	1/2
21	6-32NC-3A	1/4
22	6-32NC-3A	3/8
23	6-32NC-3A	1/2
24	6-32NC-3A	5/8
25	8-32NC-3A	1/4
26	8-32NC-3A	3/8
27	8-32NC-3A	1/2
28	8-32NC-3A	5/8
29	8-32NC-3A	3/4
30	8-36NF-3A	1/4
31	8-36NF-3A	3/8
32	8-36NF-3A	1/2
33	8-36NF-3A	5/8
34	8-36NF-3A	3/4
35	10-24NC-3A	1/4

DASH NO.	THREAD	LENGTH
36	10-24NC-3A	3/8
37	10-24NC-3A	1/2
38	10-24NC-3A	5/8
39	10-24NC-3A	3/4
40	10-24NC-3A	7/8
41	10-24NC-3A	1
42	10-32NF-3A	1/4
43	10-32NF-3A	3/8
44	10-32NF-3A	1/2
45	10-32NF-3A	5/8
46	10-32NF-3A	3/4
47	10-32NF-3A	7/8
48	10-32NF-3A	1
49	1/4-20UNC-3A	3/8
50	1/4-20UNC-3A	1/2
51	1/4-20UNC-3A	5/8
52	1/4-20UNC-3A	3/4
53	1/4-20UNC-3A	7/8
54	1/4-20UNC-3A	1
55	1/4-28UNF-3A	3/8
56	1/4-28UNF-3A	1/2
57	1/4-28UNF-3A	5/8
58	1/4-28UNF-3A	3/4
59	1/4-28UNF-3A	7/8
60	1/4-28UNF-3A	1
61	5/16-18UNC-3A	3/8
62	5/16-18UNC-3A	1/2
63	5/16-18UNC-3A	5/8
64	5/16-18UNC-3A	3/4
65	5/16-18UNC-3A	7/8
66	5/16-18UNC-3A	1
67	5/16-24UNF-3A	3/8
68	5/16-24UNF-3A	1/2
69	5/16-24UNF-3A	5/8
70	5/16-24UNF-3A	3/4

DASH NO.	THREAD	LENGTH
71	5/16-24UNF-3A	7/8
72	5/16-24UNF-3A	1
73	3/8-16UNC-3A	1/2
74	3/8-16UNC-3A	5/8
75	3/8-16UNC-3A	3/4
76	3/8-16UNC-3A	7/8
77	3/8-16UNC-3A	1
78	3/8-16UNC-3A	1-1/4
79	3/8-24UNF-3A	1/2
80	3/8-24UNF-3A	5/8
81	3/8-24UNF-3A	3/4
82	3/8-24UNF-3A	7/8
83	3/8-24UNF-3A	1
84	3/8-24UNF-3A	1-1/4
85	1/2-13UNC-3A	1
86	1/2-13UNC-3A	1-1/4
87	1/2-13UNC-3A	1-1/2
88	1/2-13UNC-3A	1-3/4
89	5/8-11UNC-3A	1
90	5/8-11UNC-3A	1-1/4
91	5/8-11UNC-3A	1-1/2
92	5/8-11UNC-3A	1-3/4
93	$2/_{56}$NC-3A	1/8
94	$2/_{56}$NC-3A	13/16
95	$4/_{40}$NC-3A	5/16
96	4/ 40NC-3A	1-1/4

DASH NO	THREAD	LENGTH
97	1/4-20UNC-3A	3-1/2
98	2-56NC-3A	11/16
99	4-40NC-3A	7/8
100	4-40NC-3A	7/16
101	10-32UNF-3A	1-1/8

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Gay Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL Joe Morton
APPROVAL D. Boggs 19 Dec 62
NASA APPROVAL W.J. Rhine 12-20-62
MIT APPROVAL W Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006783 K

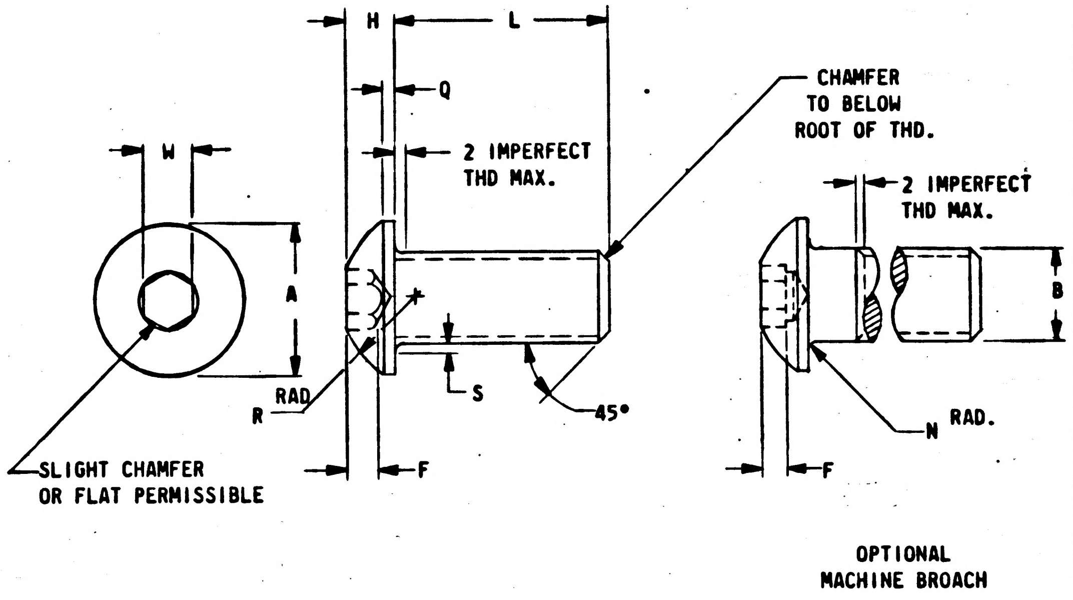
REVISIONS TDRR 00189 -12.20.62

SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10Apr63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5Aug63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8Oct63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK.
K	REVISED PER TDRR 22435	9/21/65	WK.

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404 CLASS 3.
   - H. UNLESS OTHERWISE SPECIFIED, SCREWS SHALL MEET THE REQUIREMENTS OF FF-S-86 TYPE VIII
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY & EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND NUMBER OF PIECES. THE SUPPLIERS NAME MAY APPEAR ON THE PACKAGE.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W NOM	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Roy Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC 62
APPROVAL
APPROVAL 19 Dec 62
NASA APPROVAL W J Rainé 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006783 K

REVISIONS TDRR 00149 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Apr 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5 Sep 63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK
K	REVISED PER TDRR 22435	9/21/65	WK.

DASH NO.	THREAD	LENGTH
1	0-80NF-3A	1/8
2	0-80NF-3A	3/16
3	0-80NF-3A	1/4
4	0-80NF-3A	3/8
5	1-72NF-3A	1/8
6	1-72NF-3A	3/16
7	1-72NF-3A	1/4
8	1-72NF-3A	3/8
9	2-56NC-3A	3/16
10	2-56NC-3A	1/4
11	2-56NC-3A	11/32
12	2-56NC-3A	3/8
13	2-56NC-3A	1/2
14	3-48NC-3A	3/16
15	3-48NC-3A	1/4
16	3-48NC-3A	3/8
17	3-48NC-3A	1/2
18	4-40NC-3A	1/4
19	4-40NC-3A	3/8
20	4-40NC-3A	1/2
21	6-32NC-3A	1/4
22	6-32NC-3A	3/8
23	6-32NC-3A	1/2
24	6-32NC-3A	5/8
25	8-32NC-3A	1/4
26	8-32NC-3A	3/8
27	8-32NC-3A	1/2
28	8-32NC-3A	5/8
29	8-32NC-3A	3/4
30	8-36NF-3A	1/4
31	8-36NF-3A	3/8
32	8-36NF-3A	1/2
33	8-36NF-3A	5/8
34	8-36NF-3A	3/4
35	10-24NC-3A	1/4

DASH NO.	THREAD	LENGTH
36	10-24NC-3A	3/8
37	10-24NC-3A	1/2
38	10-24NC-3A	5/8
39	10-24NC-3A	3/4
40	10-24NC-3A	7/8
41	10-24NC-3A	1
42	10-32NF-3A	1/4
43	10-32NF-3A	3/8
44	10-32NF-3A	1/2
45	10-32NF-3A	5/8
46	10-32NF-3A	3/4
47	10-32NF-3A	7/8
48	10-32NF-3A	1
49	1/4-20UNC-3A	3/8
50	1/4-20UNC-3A	1/2
51	1/4-20UNC-3A	5/8
52	1/4-20UNC-3A	3/4
53	1/4-20UNC-3A	7/8
54	1/4-20UNC-3A	1
55	1/4-28UNF-3A	3/8
56	1/4-28UNF-3A	1/2
57	1/4-28UNF-3A	5/8
58	1/4-28UNF-3A	3/4
59	1/4-28UNF-3A	7/8
60	1/4-28UNF-3A	1
61	5/16-18UNC-3A	3/8
62	5/16-18UNC-3A	1/2
63	5/16-18UNC-3A	5/8
64	5/16-18UNC-3A	3/4
65	5/16-18UNC-3A	7/8
66	5/16-18UNC-3A	1
67	5/16-24UNF-3A	3/8
68	5/16-24UNF-3A	1/2
69	5/16-24UNF-3A	5/8
70	5/16-24UNF-3A	3/4

DASH NO.	THREAD	LENGTH
71	5/16-24UNF-3A	7/8
72	5/16-24UNF-3A	1
73	3/8-16UNC-3A	1/2
74	3/8-16UNC-3A	5/8
75	3/8-16UNC-3A	3/4
76	3/8-16UNC-3A	7/8
77	3/8-16UNC-3A	1
78	3/8-16UNC-3A	1-1/4
79	3/8-24UNF-3A	1/2
80	3/8-24UNF-3A	5/8
81	3/8-24UNF-3A	3/4
82	3/8-24UNF-3A	7/8
83	3/8-24UNF-3A	1
84	3/8-24UNF-3A	1-1/4
85	1/2-13UNC-3A	1
86	1/2-13UNC-3A	1-1/4
87	1/2-13UNC-3A	1-1/2
88	1/2-13UNC-3A	1-3/4
89	5/8-11UNC-3A	1
90	5/8-11UNC-3A	1-1/4
91	5/8-11UNC-3A	1-1/2
92	5/8-11UNC-3A	1-3/4
93	2/56NC-3A	1/8
94	2/56NC-3A	13/16
95	4/40NC-3A	5/16
96	4/ 40NC-3A	1-1/4

DASH NO	THREAD	LENGTH
97	1/4-20UNC-3A	3-1/2
98	2-56NC-3A	11/16
99	4-40NC-3A	7/8
100	4-40NC-3A	7/16
101	10-32UNF-3A	1-1/8
102	2-56NC-3A	9/16

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED A. Maynard 19 DEC '62
APPROVAL Martin
APPROVAL Doggan 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

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1006783 L

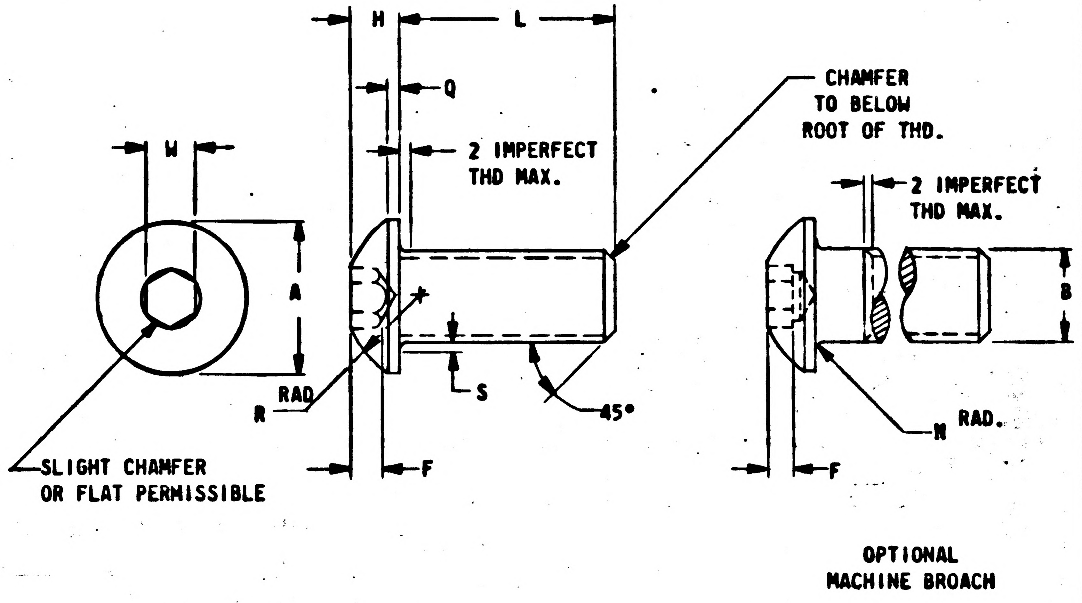
REVISIONS TDRR 00189 -12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10Apr63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5Jul63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8Oct63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK.
K	REVISED PER TDRR 22435	9/21/66	WK.
L	REVISED PER TDRR 23169	10/15/66	WK.

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404 CLASS 3.
   - H. UNLESS OTHERWISE SPECIFIED, SCREWS SHALL MEET THE REQUIREMENTS OF FF-S-86 TYPE VIII
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY & EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND NUMBER OF PIECES. THE SUPPLIERS NAME MAY APPEAR ON THE PACKAGE.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W NOM	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.461	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS.

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Gary Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC 62
APPROVAL
APPROVAL 19-Dec-62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

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1006783 L

REVISIONS TDRR 00149 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Apr 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	[illegible] 63	WK
D	REVISED PER TDRR 03392	9/26/63	[illegible]
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK
K	REVISED PER TDRR 22435	9/21/65	WK.
L	REVISED PER TDRR 23169	10/15/65	WK.

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	[illegible]
2	0-80NF-3A	3/16	[illegible]
3	0-80NF-3A	1/4	[illegible]
4	0-80NF-3A	3/8	[illegible]
5	1-72NF-3A	1/8	[illegible]
6	1-72NF-3A	3/16	[illegible]
7	1-72NF-3A	1/4	[illegible]
8	1-72NF-3A	3/8	[illegible]
9	2-56NC-3A	3/16	[illegible]
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	[illegible]
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	[illegible]
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	[illegible]
26	8-32NC-3A	3/8	[illegible]
27	8-32NC-3A	1/2	[illegible]
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	[illegible]
30	8-36NF-3A	1/4	[illegible]
31	8-36NF-3A	3/8	[illegible]
32	8-36NF-3A	1/2	[illegible]
33	8-36NF-3A	5/8	[illegible]
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	[illegible]
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	[illegible]
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	NON STANDARD
95	4/40NC-3A	5/16	-94C-05
96	4/40NC-3A	1-1/4	38031-94C-20

DASH NO	THREAD	LENGTH	VENDOR PART NO.
97	1/4-20UNC-3A	3-1/2	38031-4C-56
98	2-56NC-3A	11/16	38031-92C-11
99	4-40NC-3A	7/8	38031-94C-14
100	4-40NC-3A	7/16	
101	10-32UNF-3A	1-1/8	
102	2-56NC-3A	9/16	
103	6-32NC-3A	5/16	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL [illegible] Martin
APPROVAL D. [illegible] 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

MASTER

N 1006783

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS TDRR 00189 -12-20-62			
-	TAKEN FROM BUWEPS DWG 2318873		
A	REVISED PER TDRR 00807	10Apr63	WK.
B	REVISED PER TDRR 01273	5-15-63	WK.
C	REVISED PER TDRR 02899	5Sep63	WK
D	REVISED PER TDRR 03392	9/26/63	
E	REVISED PER TDRR 03706	8Oct63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK.
K	REVISED PER TDRR 22435	9/21/65	WK.
L	REVISED PER TDRR 23169	10/15/65	WK.
M	REVISED PER TDRR 24031	11/23/65	WK
N	REVISED PER TDRR 25537	2/15/66	WK

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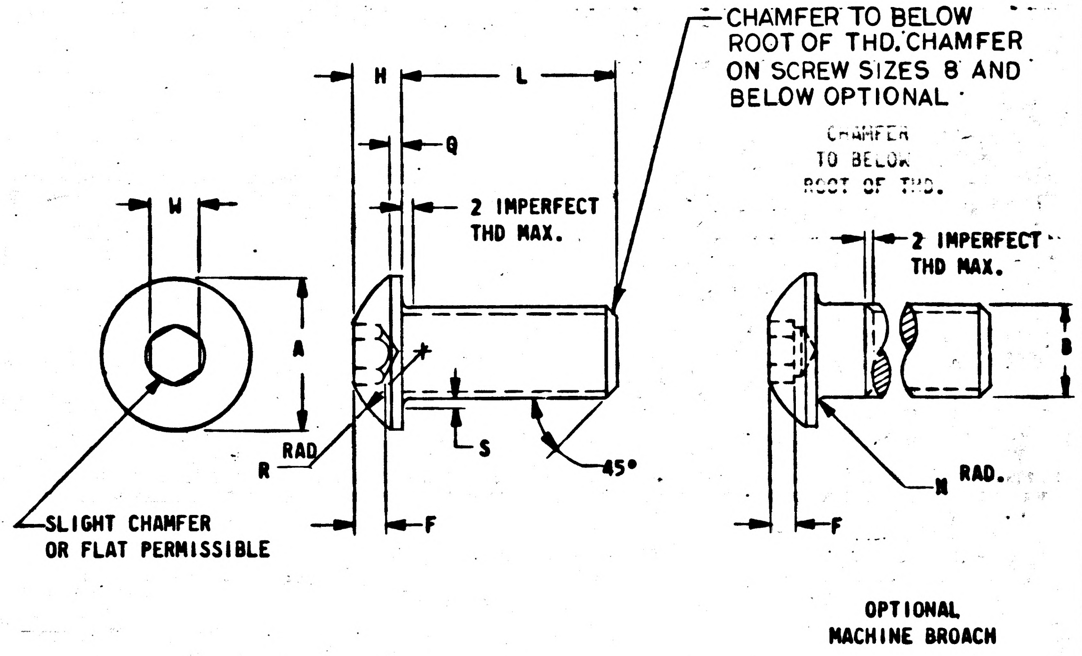
NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404 CLASS 3.
   - H. UNLESS OTHERWISE SPECIFIED, SCREWS SHALL MEET THE REQUIREMENTS OF FF-S-86 TYPE VIII
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY & EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, AND NUMBER OF PIECES. THE SUPPLIERS NAME MAY APPEAR ON THE PACKAGE.

SCREW SIZE	A	B	F MIN	H	L MAX (STANDARD)	N	Q MAX	R REF	S	W NOM	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



CHAMFER TO BELOW ROOT OF THD. CHAMFER ON SCREW SIZES 8 AND BELOW OPTIONAL
H
L
Q
W
2 IMPERFECT THD MAX.
A
RAD
R
S
45°
F
SLIGHT CHAMFER OR FLAT PERMISSIBLE
CHAMFER TO BELOW ROOT OF THD.
2 IMPERFECT THD MAX.
B
N
RAD.
F
OPTIONAL MACHINE BROACH

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS.			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Gary Wheeler DATE 17 Dec 62
CHECKED K. Maynard 19 DEC 62
APPROVAL
APPROVAL 19-Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

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N 1006783

REVISIONS TDRR 00149 12·20·62			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00807	10 Apr 63	WK
B	REVISED PER TDRR 01273	5-15-63	WK
C	REVISED PER TDRR 02899	5 Aug 63	WK
D	REVISED PER TDRR 03392	9/26/63	[illegible]
E	REVISED PER TDRR 03706	8 Oct 63	WK
F	REVISED PER TDRR 06244	2-18-64	WK
G	REVISED PER TDRR 13983	11-12-64	WK
H	REVISED PER TDRR 18121	4/21/65	WK
J	REVISED PER TDRR 20107	6/28/65	WK
K	REVISED PER TDRR 22435	9/21/65	WK.
L	REVISED PER TDRR 23169	10/19/65	WK.
M	REVISED PER TDRR 24031	11/23/65	WK
N	REVISED PER TDRR 25537	2/15/66	WK

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	[illegible]
2	0-80NF-3A	3/16	[illegible]
3	0-80NF-3A	1/4	[illegible]
4	0-80NF-3A	3/8	[illegible]
5	1-72NF-3A	1/8	[illegible]
6	1-72NF-3A	3/16	[illegible]
7	1-72NF-3A	1/4	[illegible]
8	1-72NF-3A	3/8	[illegible]
9	2-56NC-3A	3/16	[illegible]
10	2-56NC-3A	1/4	[illegible]
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	[illegible]
22	6-32NC-3A	3/8	[illegible]
23	6-32NC-3A	1/2	[illegible]
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	[illegible]
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	[illegible]
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	[illegible]
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28
93	2/56NC-3A	1/8	-92C-02
94	2/56NC-3A	13/16	NON STANDARD
95	4/40NC-3A	5/16	-94C-05
96	4/40NC-3A	1-1/4	[illegible]94C-20

DASH NO	THREAD	LENGTH	VENDOR PART NO.
97	1/4-20UNC-3A	3-1/2	38031-4C-56
98	2-56NC-3A	11/16	38031-92C-11
99	4-40NC-3A	7/8	38031-94C-14
100	4-40NC-3A	7/16	
101	10-32UNF-3A	1-1/8	
102	2-56NC-3A	9/16	
103	6-32 NC-3A	5/16	
104	6-32UNC-3A	3/4	
105	8-32UNC-3A	1	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

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APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC '62
APPROVAL J. Martin
APPROVAL D. J. Duggan 19 Dec 62
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL W. Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, BUTTON HEAD, HEX SOCKET SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT.
SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

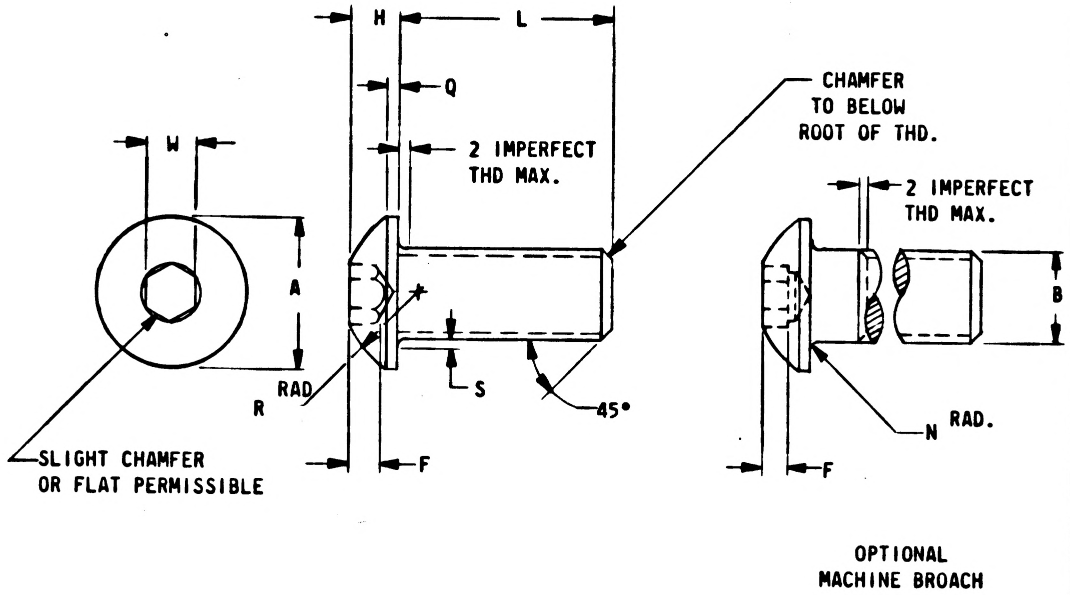
1006783

REVISIONS TORR 00189 -12-20-62			
SYM	DESCRIPTION	DATE	APPROVAL
-	TAKEN FROM BUWEPS DWG 2318873		

NOTES:

1. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: AUSTENITIC CORROSION RESISTING STEEL PER QQ-S-763.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.
   - C. THREADS SHALL CONFORM TO NATIONAL BUREAU OF STANDARDS HANDBOOK H28, CLASS 3A FOR BOTH NC AND NF SERIES.
   - D. CONCENTRICITY: BROACH TO BE CONCENTRIC WITH THREAD PITCH DIA. WITHIN "X" DIMENSION PER CHART T.I.R., SCREW HEAD SHALL BE CONCENTRIC TO THE AXIS OF THE SHANK OF THE SCREW WITHIN 3% T.I.R. OF THE MAX. BODY DIAMETER, OR .008 WHICHEVER IS GREATER. BEARING SURFACE OF HEAD TO BE SQUARE WITH BODY WITHIN ± 2°.
   - E. LENGTH TOLERANCES: UP TO AND INCLUDING 1 INCH: ± 1/64; FROM 1-1/4 INCH TO 2 INCH: +1/32 -1/64; OVER 2 INCHES: ± 1/32.
   - F. THREAD LENGTH: SCREW LENGTHS WILL BE THREADED TO HEAD.
   - G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

SCREW SIZE	A	B	F MIN	H	L MAX	N	Q MAX	R REF	S	W REF	X
0	.114-.104	.060-.0568	.020	.032-.026	.500	.010-.005	.015	.070	.010-.005	.035	.005
1	.139-.129	.073-.0695	.028	.039-.033	.500	.010-.005	.015	.080	.010-.005	.050	.005
2	.164-.154	.086-.0822	.028	.046-.038	.500	.010-.005	.015	.099	.010-.005	.050	.005
3	.188-.176	.099-.0949	.035	.052-.044	.500	.010-.005	.015	.110	.010-.005	.0625	.005
4	.213-.201	.112-.1075	.035	.059-.051	.500	.010-.005	.015	.135	.010-.005	.0625	.005
5	.238-.226	.125-.1202	.044	.066-.058	.500	.010-.005	.015	.141	.010-.005	.0781	.005
6	.262-.250	.138-.1329	.044	.073-.063	.625	.010-.005	.015	.158	.010-.005	.0781	.005
8	.312-.298	.164-.1585	.052	.087-.077	.750	.015-.010	.015	.185	.015-.010	.0937	.006
10	.361-.347	.190-.1840	.070	.101-.091	1.000	.015-.010	.020	.213	.015-.010	.1250	.007
1/4	.437-.419	.250-.2435	.087	.132-.122	1.000	.020-.015	.031	.249	.020-.015	.1562	.009
5/16	.547-.527	.313-.3053	.105	.166-.152	1.000	.020-.015	.031	.309	.020-.015	.1875	.011
3/8	.656-.636	.375-.3678	.122	.199-.185	1.250	.020-.015	.031	.368	.020-.015	.2187	.013
1/2	.875-.851	.500-.4919	.175	.265-.245	2.000	.030-.020	.046	.481	.030-.020	.3125	.018
5/8	1.000-.970	.625-.6163	.210	.331-.311	2.000	.030-.020	.062	.523	.030-.020	.3750	.021



ORIGINAL SOURCE OF SUPPLY:

INDUSTRIAL FASTENER DIVISION
STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA
CODE IDENT NO. 56878

REV-	REV-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
SEE NOTES

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED H. Maynard 19 DEC 62
APPROVAL
APPROVAL 19-Dec 62
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 1 OF 2

1006783

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1006783

REVISIONS TORR 0049 12-20-62			
SYM	DESCRIPTION	DATE	APPROVAL

DASH NO.	THREAD	LENGTH	VENDOR PART NO.
1	0-80NF-3A	1/8	38031-90F-02
2	0-80NF-3A	3/16	-90F-03
3	0-80NF-3A	1/4	-90F-04
4	0-80NF-3A	3/8	-90F-06
5	1-72NF-3A	1/8	-91F-02
6	1-72NF-3A	3/16	-91F-03
7	1-72NF-3A	1/4	-91F-04
8	1-72NF-3A	3/8	-91F-06
9	2-56NC-3A	3/16	-92C-03
10	2-56NC-3A	1/4	-92C-04
11	2-56NC-3A	11/32	
12	2-56NC-3A	3/8	-92C-06
13	2-56NC-3A	1/2	-92C-08
14	3-48NC-3A	3/16	-93C-03
15	3-48NC-3A	1/4	-93C-04
16	3-48NC-3A	3/8	-93C-06
17	3-48NC-3A	1/2	-93C-08
18	4-40NC-3A	1/4	-94C-04
19	4-40NC-3A	3/8	-94C-06
20	4-40NC-3A	1/2	-94C-08
21	6-32NC-3A	1/4	-96C-04
22	6-32NC-3A	3/8	-96C-06
23	6-32NC-3A	1/2	-96C-08
24	6-32NC-3A	5/8	-96C-10
25	8-32NC-3A	1/4	-98C-04
26	8-32NC-3A	3/8	-98C-06
27	8-32NC-3A	1/2	-98C-08
28	8-32NC-3A	5/8	-98C-10
29	8-32NC-3A	3/4	-98C-12
30	8-36NF-3A	1/4	-98F-04
31	8-36NF-3A	3/8	-98F-06
32	8-36NF-3A	1/2	-98F-08
33	8-36NF-3A	5/8	-98F-10
34	8-36NF-3A	3/4	-98F-12
35	10-24NC-3A	1/4	-3C-04
36	10-24NC-3A	3/8	38031-3C-06
37	10-24NC-3A	1/2	-3C-08
38	10-24NC-3A	5/8	-3C-10
39	10-24NC-3A	3/4	-3C-12
40	10-24NC-3A	7/8	-3C-14
41	10-24NC-3A	1	-3C-16
42	10-32NF-3A	1/4	-3F-04
43	10-32NF-3A	3/8	-3F-06
44	10-32NF-3A	1/2	-3F-08
45	10-32NF-3A	5/8	-3F-10
46	10-32NF-3A	3/4	-3F-12
47	10-32NF-3A	7/8	-3F-14
48	10-32NF-3A	1	-3F-16
49	1/4-20UNC-3A	3/8	-4C-06
50	1/4-20UNC-3A	1/2	-4C-08
51	1/4-20UNC-3A	5/8	-4C-10
52	1/4-20UNC-3A	3/4	-4C-12
53	1/4-20UNC-3A	7/8	-4C-14
54	1/4-20UNC-3A	1	-4C-16
55	1/4-28UNF-3A	3/8	-4F-06
56	1/4-28UNF-3A	1/2	-4F-08
57	1/4-28UNF-3A	5/8	-4F-10
58	1/4-28UNF-3A	3/4	-4F-12
59	1/4-28UNF-3A	7/8	-4F-14
60	1/4-28UNF-3A	1	-4F-16
61	5/16-18UNC-3A	3/8	-5C-06
62	5/16-18UNC-3A	1/2	-5C-08
63	5/16-18UNC-3A	5/8	-5C-10
64	5/16-18UNC-3A	3/4	-5C-12
65	5/16-18UNC-3A	7/8	-5C-14
66	5/16-18UNC-3A	1	-5C-16
67	5/16-24UNF-3A	3/8	-5F-06
68	5/16-24UNF-3A	1/2	-5F-08
69	5/16-24UNF-3A	5/8	-5F-10
70	5/16-24UNF-3A	3/4	-5F-12
71	5/16-24UNF-3A	7/8	38031-5F-14
72	5/16-24UNF-3A	1	-5F-16
73	3/8-16UNC-3A	1/2	-6C-08
74	3/8-16UNC-3A	5/8	-6C-10
75	3/8-16UNC-3A	3/4	-6C-12
76	3/8-16UNC-3A	7/8	-6C-14
77	3/8-16UNC-3A	1	-6C-16
78	3/8-16UNC-3A	1-1/4	-6C-20
79	3/8-24UNF-3A	1/2	-6F-08
80	3/8-24UNF-3A	5/8	-6F-10
81	3/8-24UNF-3A	3/4	-6F-12
82	3/8-24UNF-3A	7/8	-6F-14
83	3/8-24UNF-3A	1	-6F-16
84	3/8-24UNF-3A	1-1/4	-6F-20
85	1/2-13UNC-3A	1	-8C-16
86	1/2-13UNC-3A	1-1/4	-8C-20
87	1/2-13UNC-3A	1-1/2	-8C-24
88	1/2-13UNC-3A	1-3/4	-8C-28
89	5/8-11UNC-3A	1	-10C-16
90	5/8-11UNC-3A	1-1/4	-10C-20
91	5/8-11UNC-3A	1-1/2	-10C-24
92	5/8-11UNC-3A	1-3/4	-10C-28

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO
CONTRACT

DRAWN Ray Wheeler DATE 17 Dec 62
CHECKED A. Maynard 19 DEC 62
APPROVAL Marton
APPROVAL 19 Dec 62
NASA APPROVAL W.J. Rhine 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW,
BUTTON HEAD, HEX SOCKET
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006783
SCALE NONE
WT
SHEET 2 OF 2

1006783

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REVISIONS TORR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
—	TAKEN FROM BUWEPS DWG 2401782	—	—
A	REVISED PER TDRR 00444 ADDED SHEET 2	2-8-63	3-1-63 WK

(M)

NOTES:

1. REQUIREMENTS:

   A. ELECTRICAL:

      (1) OPERATING VOLTAGE: 1 KV RMS NOMINAL.

      (2) FLASH OVER:
          SEA LEVEL: 2.9 KV RMS.
          50,000 FEET ALTITUDE: 850 V.

      (3) CAPACITANCE: 1.07 MICROMICROFARADS MAXIMUM.

      (4) CURRENT RATING: 5.5 AMPERES, CONTINUOUS DUTY.

   B. CONSTRUCTION:

      (1) LUG:
          BERYLLIUM COPPER, PER QQ-C-530 CONDITION H GOLD PLATED IN ACCORDANCE WITH MIL-G-45204 TYPE II CLASS 1 (COPPER STRIKE)

      (2) INSULATION: POLYTETRAFLUOROETHYLENE (TEFLON, TFE), PER MIL-T-14073

   C. TEMPERATURE RANGE: -65°C TO +200°C.

   D. MARKING: THE UNIT, PACKAGE OR CONTAINER SHALL BE LEGIBLY AND PERMANENTLY MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA NUMBER, DASH NUMBER AND REVISION LETTER.

   E. TEST REQUIREMENTS:

      (1) AFTER INSTALLATION, THE FEEDTHRU SHALL WITHSTAND A PULL TEST OF FIVE (5) POUNDS MINIMUM.

      (2) THE FEEDTHRU SHALL WITHSTAND AN AXIAL PULL TEST OF FIVE (5) POUNDS MINIMUM BETWEEN LUG AND TEFLON BUSHING.

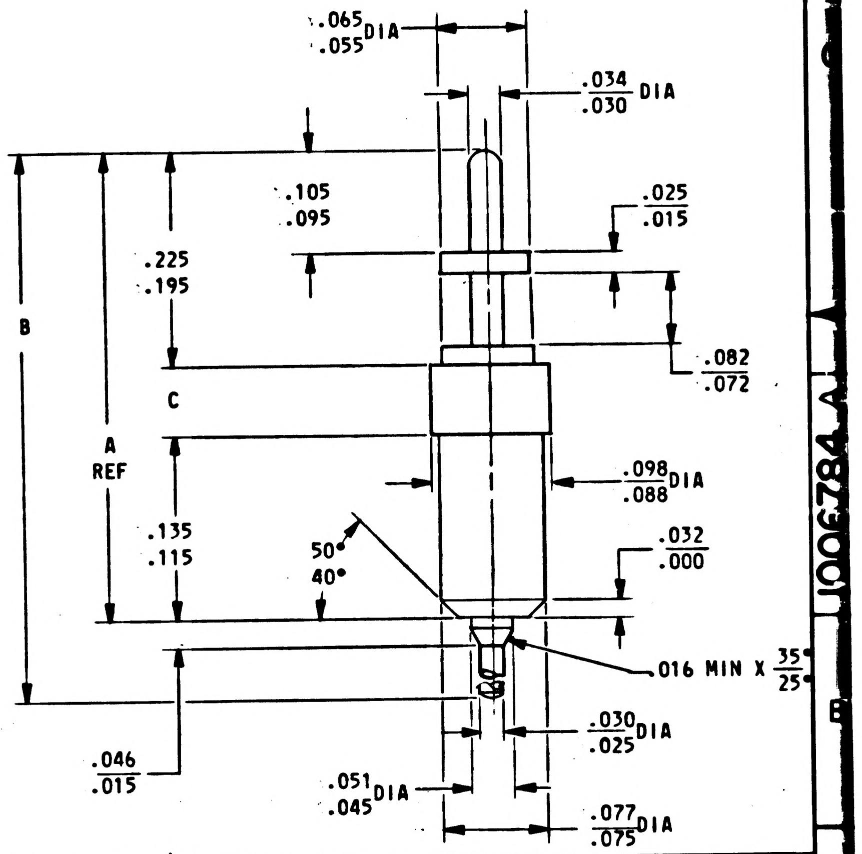
   G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT PS 1015404 CLASS III.

3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DASH NO	COLOR OF INSULATION	A REF	B	C	SEALECTRO PART NUMBER
1	BROWN	.375	1.510 / 1.490	.045 / .035	FT-MM-47 TUR BC
2	RED				
3	ORANGE				
4	YELLOW				
5	GREEN				
6	BLUE				
7	VIOLET				
8	GRAY				
9	WHITE				
10	BLACK				
11	BROWN	.425	1.710 / 1.690	.095 / .085	FT-MM-48 TUR BC
12	RED				
13	ORANGE				
14	YELLOW				
15	GREEN				
16	BLUE				
17	VIOLET				
18	GRAY				
19	WHITE				
20	BLACK				

FIGURE 1

FOR DASH NUMBERS 1 THRU 20



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DWG.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 10 DEC 62
CHECKED H Maynard 14 DEC '62
APPROVAL Joe Morton
APPROVAL D Duggan
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, FEEDTHRU
MICROMINIATURE INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006784
SCALE NONE
WT
SHEET 1 OF 2

1006784

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR - THIS SHEET ADDED 00444		WK

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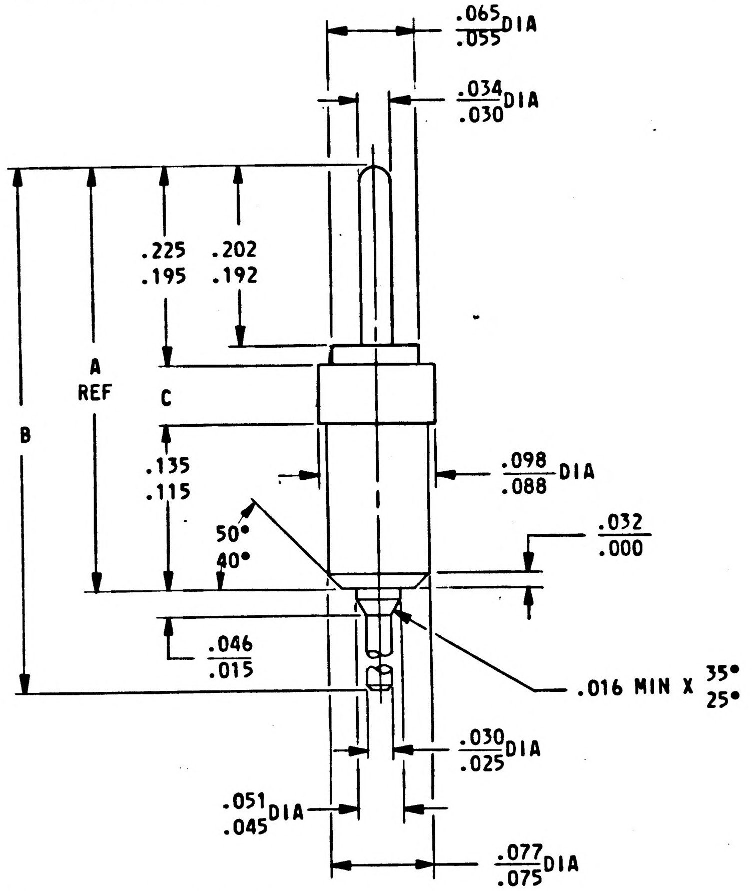
DASH NO.	COLOR OF INSULATION	A REF	B	C	SEALECTRO PART NUMBER
41	BROWN	.375	1.510 1.490	.045 .035	FT-MM-47 BC
42	RED				
43	ORANGE				
44	YELLOW				
45	GREEN				
46	BLUE				
47	VIOLET				
48	GRAY				
49	WHITE				
50	BLACK				
51	BROWN	.425	1.710 1.690	.095 .085	FT-MM-48 BC
52	RED				
53	ORANGE				
54	YELLOW				
55	GREEN				
56	BLUE				
57	VIOLET				
58	GRAY				
59	WHITE				
60	BLACK				

FIGURE 2
FOR DASH NUMBERS 41 THRU 60



REVISION A - THIS SHEET ADDED

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL **SEE NOTES**

HEAT TREATMENT **NONE**

FINAL FINISH **NONE**

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray W Beeler DATE 10 Dec 62
CHECKED N. Maynard 14 DEC '62
APPROVAL Joe Marton 2-8-63
APPROVAL 2-8-63
NASA APPROVAL Jack Bernard 2/20/63
MIT APPROVAL W Kupfer 20 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, FEEDTHRU
MICROMINIATURE INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. **1006784**

SCALE **NONE** WT SHEET **2** OF **2**

1006784

B | 1006784

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS *TDRR 00189 12-20-62*			
—	TAKEN FROM BUWEPS DWG 2401782	—	—
A	REVISED PER TDRR *00444* ADDED SHEET 2	*2-8-63*	*1-1-63* *WK*
B	REVISED PER TDRR 22434	*9/21/65*	*WK*

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NOTES:

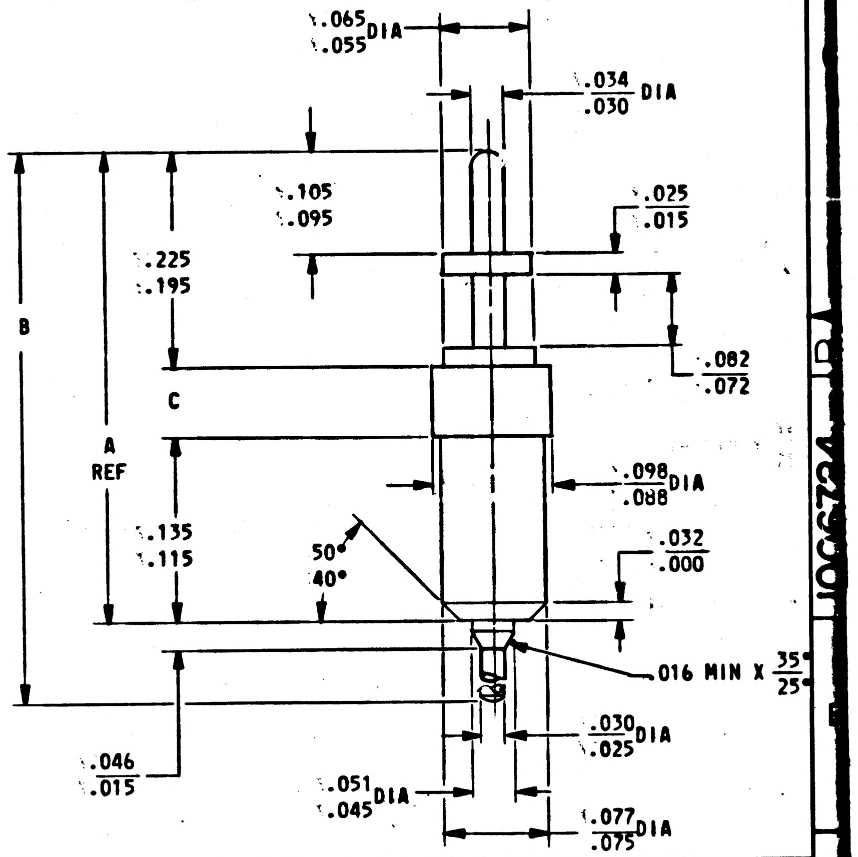
1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) OPERATING VOLTAGE: 1 KV RMS NOMINAL.
     - (2) FLASH OVER:
       SEA LEVEL: 2.9 KV RMS.
       50,000 FEET ALTITUDE: 850 V.
     - (3) CAPACITANCE: 1.07 MICROMICROFARADS MAXIMUM.
     - (4) CURRENT RATING: 5.5 AMPERES, CONTINUOUS DUTY.
   - B. CONSTRUCTION:
     - (1) LUG:
       BERYLLIUM COPPER, PER QQ-C-530 CONDITION H GOLD PLATED IN ACCORDANCE WITH MIL-G-45204 TYPE II CLASS 1 (COPPER STRIKE)
     - (2) INSULATION: POLYTETRAFLUOROETHYLENE (TEFLON, TFE), PER MIL-T-14073
   - C. TEMPERATURE RANGE: -65°C TO +200°C.
   - D. MARKING: THE UNIT, PACKAGE OR CONTAINER SHALL BE LEGIBLY AND PERMANENTLY MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA NUMBER, DASH NUMBER AND REVISION LETTER.
   - E. TEST REQUIREMENTS:
     - (1) AFTER INSTALLATION, THE FEEDTHRU SHALL WITHSTAND A PULL TEST OF FIVE (5) POUNDS MINIMUM.
     - (2) THE FEEDTHRU SHALL WITHSTAND AN AXIAL PULL TEST OF FIVE (5) POUNDS MINIMUM BETWEEN LUG AND TEFLON BUSHING.

6. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT PS 1015404 CLASS III.

7. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DASH NO	COLOR OF INSULATION	A REF	B	C
1	BROWN	.375	1.510 1.490	.045 .035
2	RED			
3	ORANGE			
4	YELLOW			
5	GREEN			
6	BLUE			
7	VIOLET			
8	GRAY			
9	WHITE			
10	BLACK			
11	BROWN	.425	1.710 1.690	.095 .085
12	RED			
13	ORANGE			
14	YELLOW			
15	GREEN			
16	BLUE			
17	VIOLET			
18	GRAY			
19	WHITE			
20	BLACK			

FIGURE 1
FOR DASH NUMBERS 1 THRU 20



MASTER

PROCURE ONLY FROM APPROVED SOURCES
LISTED ON ND1002034 FOR THIS DWG.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN *Ray Wheeler* DATE *10 Dec 62*
CHECKED *H Maynard 14 DEC'62*
APPROVAL *Joe Morton*
APPROVAL *D J Duggan*
NASA APPROVAL *W J Rhine 12-22-62*
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, FEEDTHRU
MICROMINIATURE INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006784
SCALE NONE
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

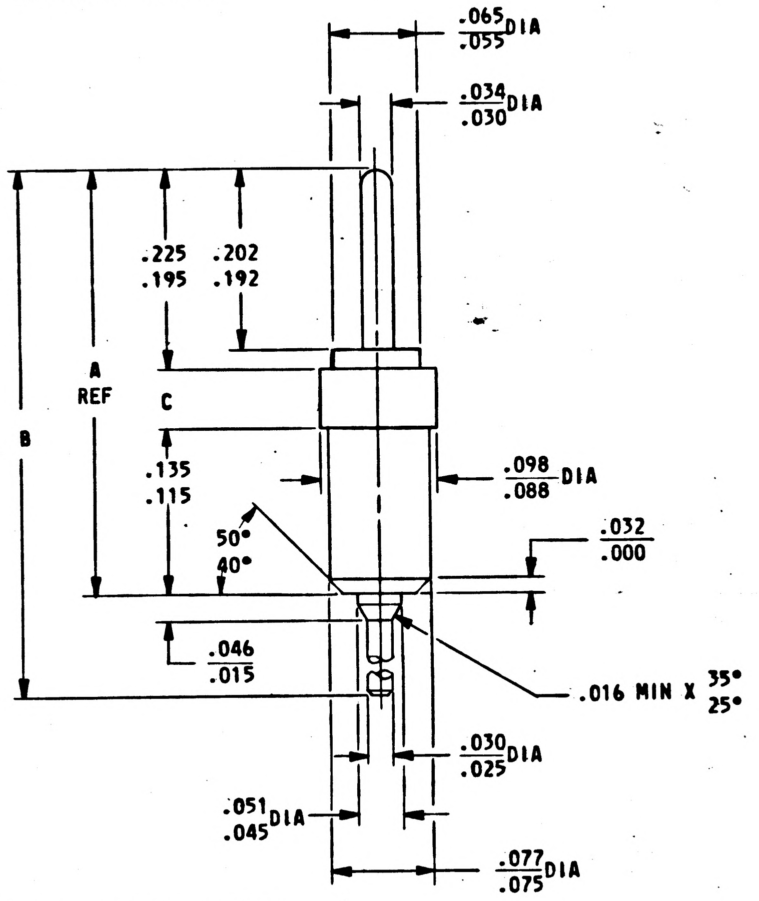
B 1006784

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00444 - THIS SHEET ADDED		WK
B	REVISED PER TDRR 22434	6/21/65	CK

(M)

DASH NO.	COLOR OF INSULATION	A REF	B	C
41	BROWN	.375	1.510 1.490	.045 .035
42	RED			
43	ORANGE			
44	YELLOW			
45	GREEN			
46	BLUE			
47	VIOLET			
48	GRAY			
49	WHITE			
50	BLACK			
51	BROWN	.425	1.710 1.690	.095 .085
52	RED			
53	ORANGE			
54	YELLOW			
55	GREEN			
56	BLUE			
57	VIOLET			
58	GRAY			
59	WHITE			
60	BLACK			

FIGURE 2
FOR DASH NUMBERS 41 THRU 60



REVISION A - THIS SHEET ADDED

MASTER

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LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

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FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
SEE NOTES
HEAT TREATMENT
NONE
FINAL FINISH
NONE

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CHECKED H. Maynard 14 DEC '62
APPROVAL Joe Marton 2-8-63
APPROVAL 2-8-63
NASA APPROVAL Jack Bernard 2/5/63
MIT APPROVAL W Kupfer 2/6/63

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TERMINAL, FEEDTHRU
MICROMINIATURE INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006784
SCALE NONE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006784

REVISIONS TORR 00189 12-20-62

SYM	DESCRIPTION	DATE	APPROVAL
—	TAKEN FROM BUWEPS DWG 2401782	—	—

NOTES:

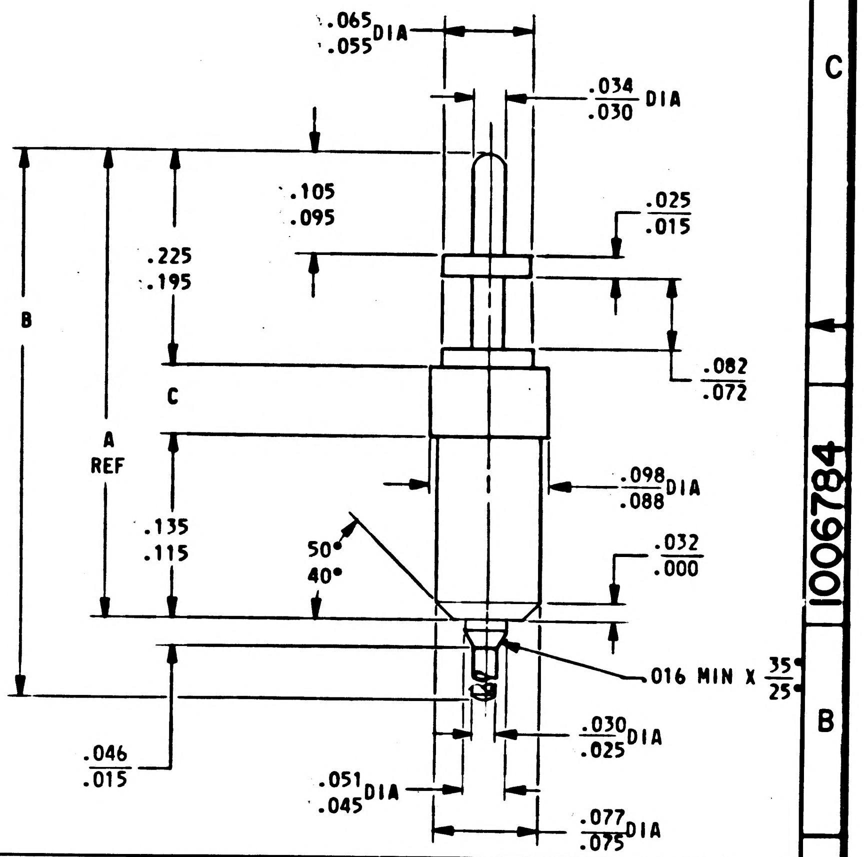
1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) OPERATING VOLTAGE: 1 KV RMS NOMINAL.
     - (2) FLASH OVER:
       - SEA LEVEL: 2.9 KV RMS.
       - 50,000 FEET ALTITUDE: 850 V.
     - (3) CAPACITANCE: 1.07 MICROMICROFARADS MAXIMUM.
     - (4) CURRENT RATING: 5.5 AMPERES, CONTINUOUS DUTY.
   - B. CONSTRUCTION:
     - (1) LUG:
       - BERYLLIUM COPPER, PER QQ-C-530 CONDITION H GOLD PLATED IN ACCORDANCE WITH MIL-G-45204 TYPE II CLASS 1 (COPPER STRIKE)
     - (2) INSULATION: POLYTETRAFLUOROETHYLENE (TEFLON, TFE), PER MIL-T-14073
   - C. TEMPERATURE RANGE: -65°C TO +200°C.
   - D. MARKING: THE UNIT, PACKAGE OR CONTAINER SHALL BE LEGIBLY AND PERMANENTLY MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA NUMBER, DASH NUMBER AND REVISION LETTER.
   - E. ENVIRONMENTAL: UNITS SHALL BE CAPABLE OF WITHSTANDING THE ENVIRONMENTAL TESTS SPECIFIED IN NASA DOCUMENT ND1002000.
   - F. TEST REQUIREMENTS:
     - (1) AFTER INSTALLATION, THE FEEDTHRU SHALL WITHSTAND A PULL TEST OF FIVE (5) POUNDS MINIMUM.
     - (2) THE FEEDTHRU SHALL WITHSTAND AN AXIAL PULL TEST OF FIVE (5) POUNDS MINIMUM BETWEEN LUG AND TEFLON BUSHING.

DASH NO	COLOR OF INSULATION	A REF	B	C	SEALECTRO PART NUMBER
1	BROWN	.425 .375	1.510 1.490	.045 .035	FT-MM-47 TUR BC
2	RED				
3	ORANGE				
4	YELLOW				
5	GREEN				
6	BLUE				
7	VIOLET				
8	GRAY				
9	WHITE				
10	BLACK				
11	BROWN		1.710 1.690	.095 .085	FT-MM-48 TUR BC
12	RED				
13	ORANGE				
14	YELLOW				
15	GREEN				
16	BLUE				
17	VIOLET				
18	GRAY				
19	WHITE				
20	BLACK				

6. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT PS 1015404 CLASS III.

3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

FIGURE 1



1006784

ORIGINAL SOURCE OF SUPPLY:

SEALECTRO CORPORATION
MAMARONECK, NEW YORK
CODE IDENT NO. 98291

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 10 Dec 62
CHECKED H Maynard 14 DEC '62
APPROVAL Joe Morton
APPROVAL
NASA APPROVAL W J Rhine 12-20-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, FEEDTHRU
MICROMINIATURE INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006784
SCALE NONE
WT
SHEET 1 OF 1

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1006785 A

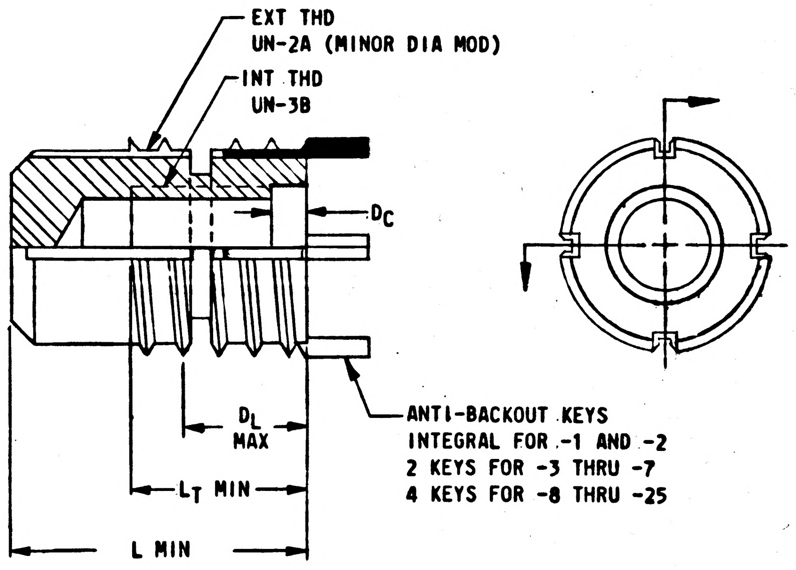
REVISIONS TDRR 00189 12·20·62			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02391	8/7/69	JPY

(M)

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: CRES IN ACCORDANCE WITH QQ-S-763, CLASS 303.
   - B. FINISH: DRY LUBRICANT (MOLYKOTE) IN ACCORDANCE WITH MIL-L-25504.
   - C. EXTERNAL THREADS: MODIFIED CLASS 2A 60° V-THREAD IN ACCORDANCE WITH HANDBOOK H-28. MODIFICATION IS THAT THE MINOR DIAMETER IS MADE LARGER AND HAS A MAXIMUM VALUE LESS THAN THE MINIMUM TAP DRILL SIZE.
   - D. INTERNAL THREADS: STANDARD CLASS 3B 60° V-THREAD EXCEPT THAT ONE OR MORE OF THE THREADS (INDICATED BY EXTERNAL ANNULAR GROOVE) IS DEFORMED TO PROVIDE A LOCKING FEATURE. CAUTION: DO NOT INSERT STANDARD PLUG GAGES FURTHER THAN LOCKING THREADS.
   - E. MARKING: EACH SHIPPING CONTAINER SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE NASA DRAWING NUMBER, THE DASH NUMBER AND THE REVISION LETTER. THE MANUFACTURER'S NAME OR SYMBOL AND PART NUMBER MAY ALSO APPEAR ON THE PACKAGE. SHALL CONTAIN A SLIP WITH THE NASA PART NUMBER.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.

DASH NO.	EXT THD LT	EXT THD SIZE	DEPTH TO LOCK D_L	TAP DRILL FOR EXT THD MIN	MAX	INSERT LENGTH L	INT THD SIZE	INT. THD D	DEPTH CBORE D_C	
-1	.25	NO.12-24	.16	.179	.183	.43	NO. 4-40	.25	CSK	
-2	.25	1/4-20	.17	.212	.216	.43	NO. 6-32	.25	CSK	
-3	.31	5/16-18	.31	.271	.276	.50	NO. 8-32	.31	.04	
-4 -5	.31	3/8-16	.31 .31	.331	.336	.56	NO.10-32 NO.10-24	.31	.07	
-6 -7	.37	7/16-14	.33 .36	.396	.401	.62	1/4-28 1/4-20	.37	.07	
-8 -9	.43	1/2-13	.34 .37	.452	.457	.75	5/16-24 5/16-18	.43	.07	
-10 -11	.50	9/16-12	.37 .41	.515	.521	.81	3/8-24 3/8-16	.50	.07	
-12 -13	.62	5/8-11	.42 .46	.577	.583	1.00	7/16-20 7/16-14	.62	.10	
-14 -15	.68	11/16-11	.42 .47	.640	.646	1.06	1/2-20 1/2-13	.68	.10	
-16 -17	.81	13/16-16	.48 .54	.765	.771	1.25	9/16-18 9/16-12	.81	.10	
-18 -19	.87	7/8-14	.49 .57	.827	.833	1.31	5/8-18 5/8-11	.87	.10	
-20 -21	1.25	1-1/8-12	.68 .75	1.061	1.067	1.75	3/4-16 3/4-10	1.25	.10	
-22 -23	1.37	1-1/4-12	.69 .77	1.186	1.192	1.94	7/8-14 7/8-9	1.37	.10	
-24 -25	1.50	1-3/8-12	.78 .86	1.311	1.317	2.12	1-12 1-8	1.50	.10	



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

6500 AVALON BLVD.
LOS ANGELES, CALIF.
CODE IDENT. NO. 98004

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Roy Wheeler DATE 6 Dec 62
CHECKED D. M. Sharpe 13 DEC 62
APPROVAL Joe Mastro
APPROVAL E. J. Duggan
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL W. W. 20 Dec 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, SCREW THREAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006785
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS TDRR 00189 12.20.62			
SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: CRES IN ACCORDANCE WITH QQ-S-763, CLASS 303.
   - B. FINISH: DRY LUBRICANT (MOLYKOTE) IN ACCORDANCE WITH MIL-L-25504.
   - C. EXTERNAL THREADS: MODIFIED CLASS 2A 60° V-THREAD IN ACCORDANCE WITH HANDBOOK H-28. MODIFICATION IS THAT THE MINOR DIAMETER IS MADE LARGER AND HAS A MAXIMUM VALUE LESS THAN THE MINIMUM TAP DRILL SIZE.
   - D. INTERNAL THREADS: STANDARD CLASS 3B 60° V-THREAD EXCEPT THAT ONE OR MORE OF THE THREADS (INDICATED BY EXTERNAL ANNULAR GROOVE) IS DEFORMED TO PROVIDE A LOCKING FEATURE. CAUTION: DO NOT INSERT STANDARD PLUG GAGES FURTHER THAN LOCKING THREADS.
   - E. MARKING: EACH PART SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURERS NAME, SYMBOL OR TRADEMARK, AND PART NUMBER. EACH SHIPPING CONTAINER SHALL BE MARKED IN ADDITION WITH NASA PART NUMBER AND QUANTITY AND EACH INTERNAL CONTAINER SHALL CONTAIN A SLIP WITH THE NASA PART NUMBER.
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3. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404 CLASS III.

DASH NO.	EXT THD LT	EXT THD SIZE	DEPTH TO LOCK D_L	TAP DR'LL FOR EXT THD		INSERT LENGTH L	INT THD SIZE	INT THD D	DEPTH CBORE D_C	
				MIN	MAX					
-1	.25	NO.12-24	.16	.179	.183	.43	NO. 4-40	.25	CSK	
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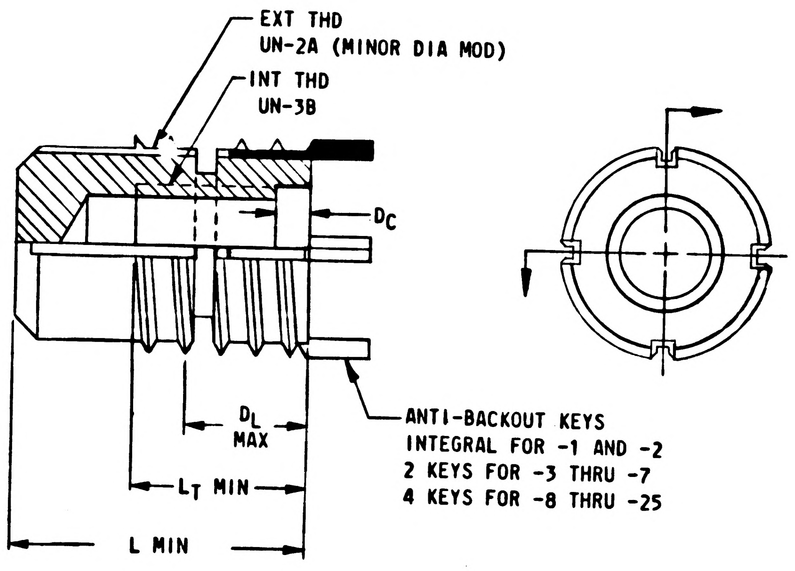
-24 -25	1.50	1-3/8-12	.78 .86	1.311	1.317	2.12	1-12 1-8	1.50	.10	



ANTI-BACKOUT KEYS
INTEGRAL FOR -1 AND -2
2 KEYS FOR -3 THRU -7
4 KEYS FOR -8 THRU -25

ORIGINAL SOURCE OF SUPPLY:

NEWTON INSERT CO.
6500 AVALON BLVD.
LOS ANGELES, CALIF.
CODE IDENT. NO. 98004

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH SEE NOTES

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DRAWN Ray Wheeler DATE 6 Dec 62
CHECKED D. M. Sharpe 13 DEC 62
APPROVAL Joe Mastrone
APPROVAL D. J. Duggan
NASA APPROVAL W. J. Rhine 12-20-62
MIT APPROVAL W. Kupfer 20 Dec 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT, SCREW THREAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006785
SCALE NONE
WT
SHEET 1 OF 1

1006786 A

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	SEE PROCUREMENT NOTE NO. 3		
A	REVISED PER TDRR 00513	6/3/63	WK

⑰

NOTES:

1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) CURRENT PULSE (Im):
       - (a) AT 25°C: 590 MILLIAMPERES
       - (b) AT 0°C: 635 MILLIAMPERES
       - (c) AT 70°C: 510 MILLIAMPERES
     - (2) PARTIAL CURRENT PULSE (Id):
       - (a) AT 25°C: 357 MILLIAMPERES
       - (b) AT 0°C: 381 MILLIAMPERES
       - (c) AT 70°C: 306 MILLIAMPERES
     - (3) SELECTED UNDISTURBED ONE VOLTAGE OUTPUT (uV_1):
       - (a) AT 25°C: EQUAL TO OR GREATER THAN 60 MILLIVOLTS.
       - (b) AT 0°C: EQUAL TO OR GREATER THAN 75 MILLIVOLTS.
       - (c) AT 70°C: EQUAL TO OR GREATER THAN 35 MILLIVOLTS.
     - (4) SELECTED DISTURBED ZERO VOLTAGE OUTPUT (dVz):
       - (a) AT 25°C, 0°C AND 70°C: LESS THAN OR EQUAL TO 10 MILLIVOLTS.
     - (5) RISE TIME (Tr):
       - (a) AT 25°C, 0°C AND 70°C: 0.4 MICROSECOND.
     - (6) PULSE DURATION (Td):
       - (a) AT 25°C, 0°C AND 70°C: 3.0 MICROSECONDS (FROM 50% ON THE RISE TO 50% ON THE FALL OF THE PEAK AMPLITUDE OF THE CURRENT PULSE).
     - (7) PEAKING TIME (Tp):
       - (a) AT 25°C, 0°C AND 70°C: 0.68 PLUS OR MINUS .05 MICROSECOND.
     - (8) SWITCHING TIME (Ts)
       - (a) AT 25°C: LESS THAN OR EQUAL TO 1.45 MICROSECONDS.
       - (b) AT 0°C: LESS THAN OR EQUAL TO 1.25 MICROSECONDS.
       - (c) AT 70°C: LESS THAN OR EQUAL TO 1.75 MICROSECONDS.
   - B. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - C. QUALITY ASSURANCE PROVISIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE REQUIREMENTS OF NASA DOCUMENT PS 1015404, SECTION
     - (2) ACCEPTANCE INSPECTION:
       - (a) CORES SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS 100 PERCENT AT 25°C. A 1 PERCENT SAMPLE SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS AT 0°C AND 70°C.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

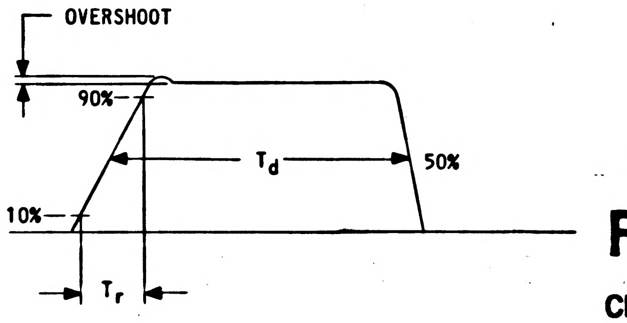


FIG. 1 CURRENT PULSE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00467 DATE 2-27-63

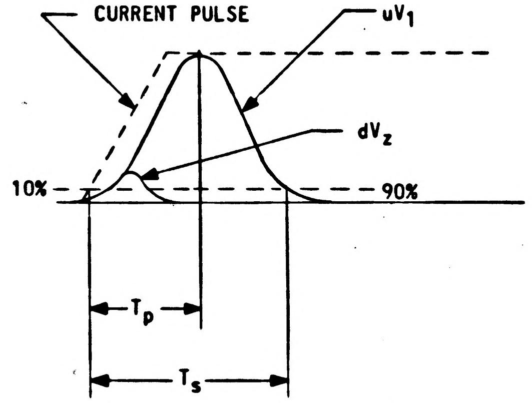
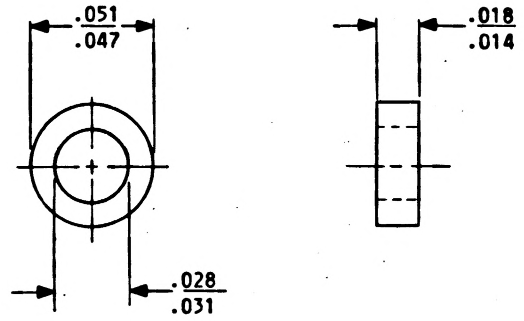


FIG. 2 VOLTAGE RESPONSE OF CORE



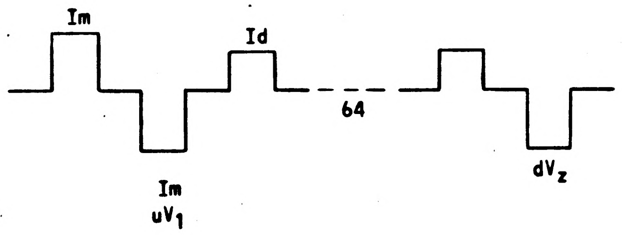


FIG. 3 CURRENT PULSE SEQUENCE.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON

APPLICATION

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FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. WHEELER DATE 26DEC62
CHECKED D.M. SLEEPER 11 JAN63
APPROVAL CW Mayo 2-27-63
APPROVAL
NASA APPROVAL W J Rhine 2-27-63
MIT APPROVAL 27 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MAGNETIC CORE, FERRITE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006786
SCALE NONE | WT | SHEET 1 OF 1

1006786

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B	1006786

REVISIONS 00467 2-27-63

SYM	DESCRIPTION	DATE	APPROVAL
-	SEE PROCUREMENT NOTE NO. 3		
A	REVISED PER TDRR 00513	6/3/63	WK
B	REVISED AND UPGRADED TO CLASS A RELEASE PER TDRR 03137	12SEP63	WK

NOTES:

1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) CURRENT PULSE (Im):
       - (a) AT 25°C: 590 MILLIAMPERES ± 6 MILLIAMPERES.
       - (b) AT 0°C: 635 MILLIAMPERES ± 6 MILLIAMPERES.
       - (c) AT 70°C: 510 MILLIAMPERES ± 5 MILLIAMPERES.
     - (2) PARTIAL CURRENT PULSE (Id):
       - (a) AT 25°C: 349 MILLIAMPERES ± 4 MILLIAMPERES.
       - (b) AT 0°C: 360 MILLIAMPERES ± 4 MILLIAMPERES.
       - (c) AT 70°C: 298 MILLIAMPERES ± 3 MILLIAMPERES.
     - (3) PULSE REPETITION RATE OF Im AND Id: NOT CRITICAL.
     - (4) NUMBER OF PARTIAL CURRENT PULSES: 5 OR MORE.
     - (5) RISE TIME (Tr):
       - (a) AT 25°C, 0°C AND 70°C: 0.4 MICROSECOND ± .02 MICROSECONDS.
     - (6) PULSE DURATION (Td):
       - (a) AT 25°C, 0°C AND 70°C: 3.0 MICROSECONDS (FROM 50% ON THE RISE TO 50% ON THE FALL OF THE PEAK AMPLITUDE OF THE CURRENT PULSE). ± .15 MICROSECONDS.
     - (7) SELECTED UNDISTURBED ONE VOLTAGE OUTPUT (uV_1):
       - (a) AT 25°C: EQUAL TO OR GREATER THAN 60 MILLIVOLTS.
       - (b) AT 0°C: EQUAL TO OR GREATER THAN 75 MILLIVOLTS.
       - (c) AT 70°C: EQUAL TO OR GREATER THAN 40 MILLIVOLTS.
     - (8) SELECTED DISTURBED ZERO VOLTAGE OUTPUT (dVz):
       - (a) AT 25°C, 0°C AND 70°C: LESS THAN OR EQUAL TO 10 MILLIVOLTS.
     - (9) PEAKING TIME (Tp):
       - (a) AT 25:C, 0°C AND 70°C: 0.68 PLUS OR MINUS .05 MICROSECOND.
     - (10) SWITCHING TIME (Ts)
       - (a) AT 25°C: LESS THAN OR EQUAL TO 1.45 MICROSECONDS.
       - (b) AT 0°C° LESS THAN OR EQUAL TO 1.25 MICROSECONDS.
       - (c) AT 70°C: LESS THAN OR EQUAL TO 1.75 MICROSECONDS.
   - B. QUALITY ASSURANCE PROVISIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE REQUIREMENTS OF ND 1015404, CLASS 3.
     - (2) ACCEPTANCE INSPECTION:
       - (a) CORES SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS 100 PERCENT AT 25°C. A 1 PERCENT SAMPLE SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS AT 0°C AND 70°C.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

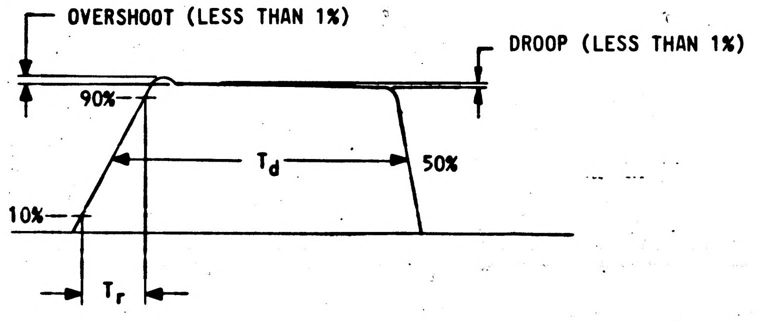


FIG. 1 CURRENT PULSE

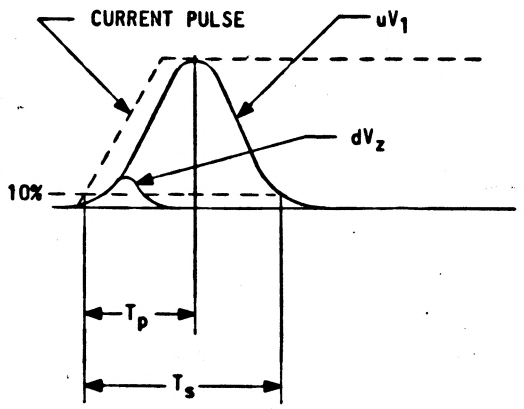
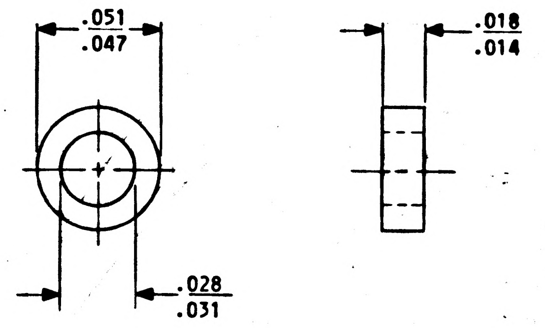


FIG. 2 VOLTAGE RESPONSE OF CORE



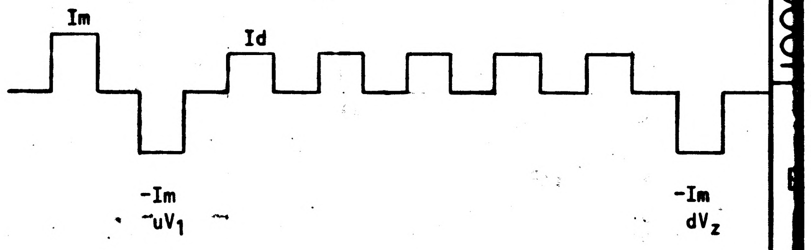


FIG. 3 CURRENT PULSE SEQUENCE

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. WHEELER DATE 26DEC62
CHECKED R.M. SLEEPER 11 JAN63
APPROVAL C.W. Mayo 2-27-63
APPROVAL Eldon C Hall 10Sept63
NASA APPROVAL W. J. Rhine 2-27-63
MIT APPROVAL 27FEB63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MAGNETIC CORE, FERRITE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006786
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

C	1006786

REVISIONS 00467 2-27-63			
SYM	DESCRIPTION	DATE	APPROVAL
-	SEE PROCUREMENT NOTE NO. 3		
A	REVISED PER TDRR 00513	6/3/63	WK
B	REVISED AND UPGRADED TO CLASS A RELEASE PER TDRR 03137	12SEP63	WK
C	REVISED PER TDRR 18624	5/11/65	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) CURRENT PULSE (Im):
       - (a) AT 25°C: 590 MILLIAMPERES ± 6 MILLIAMPERES.
       - (b) AT 0°C: 635 MILLIAMPERES ± 6 MILLIAMPERES.
       - (c) AT 70°C: 510 MILLIAMPERES ± 5 MILLIAMPERES.
     - (2) PARTIAL CURRENT PULSE (Id):
       - (a) AT 25°C: 349 MILLIAMPERES ± 4 MILLIAMPERES.
       - (b) AT 0°C: 360 MILLIAMPERES ± 4 MILLIAMPERES.
       - (c) AT 70°C: 290 MILLIAMPERES ± 3 MILLIAMPERES.
     - (3) PULSE REPETITION RATE OF Im AND Id: NOT CRITICAL.
     - (4) NUMBER OF PARTIAL CURRENT PULSES: 5 OR MORE.
     - (5) RISE TIME (Tr):
       - (a) AT 25°C, 0°C AND 70°C: 0.4 MICROSECOND ± .02 MICROSECONDS.
     - (6) PULSE DURATION (Td):
       - (a) AT 25°C, 0°C AND 70°C: 3.0 MICROSECONDS (FROM 50% ON THE RISE TO 50% ON THE FALL OF THE PEAK AMPLITUDE OF THE CURRENT PULSE). ± .15 MICROSECONDS.
     - (7) SELECTED UNDISTURBED ONE VOLTAGE OUTPUT (uV_1):
       - (a) AT 25°C: EQUAL TO OR GREATER THAN 60 MILLIVOLTS.
       - (b) AT 0°C: EQUAL TO OR GREATER THAN 75 MILLIVOLTS.
       - (c) AT 70°C: EQUAL TO OR GREATER THAN 40 MILLIVOLTS.
     - (8) SELECTED DISTURBED ZERO VOLTAGE OUTPUT (dVz):
       - (a) AT 25°C, 0°C AND 70°C: LESS THAN OR EQUAL TO 10 MILLIVOLTS.
     - (9) PEAKING TIME (Tp):
       - (a) AT 25:C, 0°C AND 70°C: 0.68 PLUS OR MINUS .05 MICROSECOND.
     - (10) SWITCHING TIME (Ts)
       - (a) AT 25°C: LESS THAN OR EQUAL TO 1.45 MICROSECONDS.
       - (b) AT 0°C• LESS THAN OR EQUAL TO 1.25 MICROSECONDS.
       - (c) AT 70°C: LESS THAN OR EQUAL TO 1.75 MICROSECONDS.
   - B. QUALITY ASSURANCE PROVISIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE REQUIREMENTS OF ND 1015404, CLASS 3.
     - (2) ACCEPTANCE INSPECTION:
       - (a) CORES SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS 100 PERCENT AT 25°C. A 1 PERCENT SAMPLE SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS AT 0°C AND 70°C. IN ACCORDANCE WITH MIL-STD-105, .25 PRECENT AQL.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

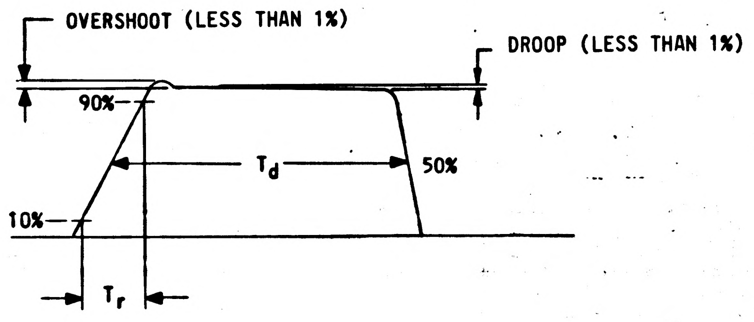


FIG. 1 CURRENT PULSE

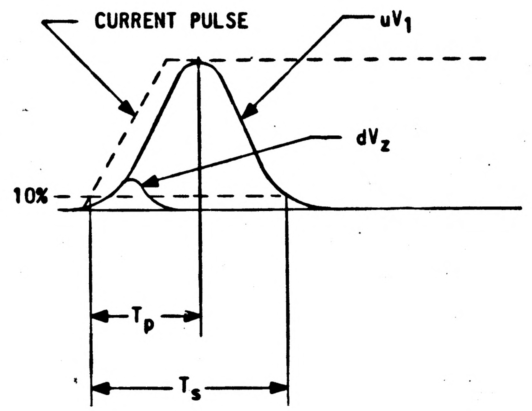
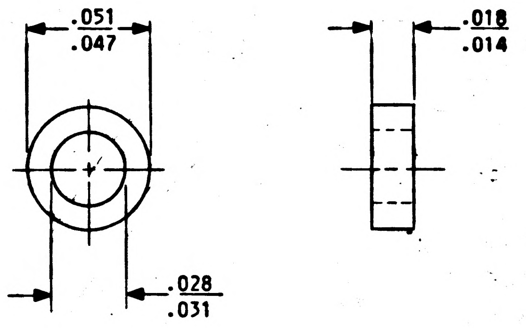


FIG. 2 VOLTAGE RESPONSE OF CORE



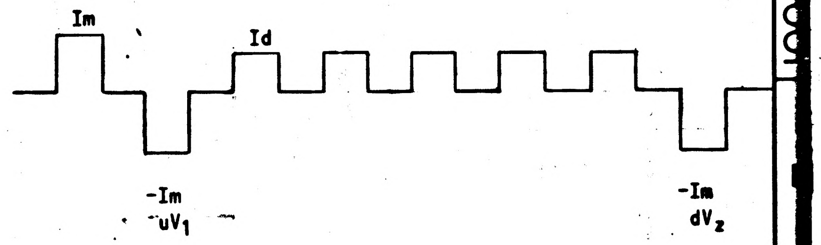


FIG. 3 CURRENT PULSE SEQUENCE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. WHEELER DATE 26DEC62
CHECKED D.M. SLEEPER 11 JAN63
APPROVAL C.W. Mayo 2-27-63
APPROVAL Eldon C Hall 10Sept63
NASA APPROVAL W. J. [illegible] 2-27-63
MIT APPROVAL [illegible] 27Feb63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MAGNETIC CORE, FERRITE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006786
SCALE NONE	WT	SHEET 1 OF 1

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1006786

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	SEE PROCUREMENT NOTE NO. 3		

NOTES:

1. REQUIREMENTS:
   - A. ELECTRICAL:
     - (1) CURRENT PULSE (Im):
       - (a) AT 25°C: 590 MILLIAMPERES
       - (b) AT 0°C: 635 MILLIAMPERES
       - (c) AT 70°C: 510 MILLIAMPERES
     - (2) PARTIAL CURRENT PULSE (Id):
       - (a) AT 25°C: 357 MILLIAMPERES
       - (b) AT 0°C: 381 MILLIAMPERES
       - (c) AT 70°C: 306 MILLIAMPERES
     - (3) SELECTED UNDISTURBED ONE VOLTAGE OUTPUT (uV_1):
       - (a) AT 25°C: EQUAL TO OR GREATER THAN 60 MILLIVOLTS.
       - (b) AT 0°C: EQUAL TO OR GREATER THAN 75 MILLIVOLTS.
       - (c) AT 70°C: EQUAL TO OR GREATER THAN 35 MILLIVOLTS.
     - (4) SELECTED DISTURBED ZERO VOLTAGE OUTPUT (dVz):
       - (a) AT 25°C, 0°C AND 70°C: LESS THAN OR EQUAL TO 10 MILLIVOLTS.
     - (5) RISE TIME (Tr):
       - (a) AT 25°C, 0°C AND 70°C: 0.4 MICROSECOND.
     - (6) PULSE DURATION (Td):
       - (a) AT 25°C, 0°C AND 70°C: 3.0 MICROSECONDS (FROM 50% ON THE RISE TO 50% ON THE FALL OF THE PEAK AMPLITUDE OF THE CURRENT PULSE).
     - (7) PEAKING TIME (Tp):
       - (a) AT 25°C, 0°C AND 70°C: 0.68 PLUS OR MINUS .05 MICROSECOND.
     - (8) SWITCHING TIME (Ts)
       - (a) AT 25°C: LESS THAN OR EQUAL TO 1.45 MICROSECONDS.
       - (b) AT 0°C: LESS THAN OR EQUAL TO 1.25 MICROSECONDS.
       - (c) AT 70°C: LESS THAN OR EQUAL TO 1.75 MICROSECONDS.
   - B. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - C. QUALITY ASSURANCE PROVISIONS:
     - (1) SUPPLIER SHALL CONFORM TO THE REQUIREMENTS OF NASA DOCUMENT PS 1015404, SECTION
     - (2) ACCEPTANCE INSPECTION:
       - (a) CORES SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS 100 PERCENT AT 25°C. A 1 PERCENT SAMPLE SHALL BE TESTED FOR ELECTRICAL REQUIREMENTS AT 0°C AND 70°C.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. PROCUREMENT NOTE:
   - A. WAIVE, AS REQUIRED, ALL INFORMATION ON THIS DRAWING EXCEPT PHYSICAL DIMENSIONS.
   - B. UPON SPECIFIC INSTRUCTION BY TECHNICAL DIRECTIVE (TD), PROCURE THIS PART AS CHANGE SYMBOL DASH (-) BY ORDERING TO VENDOR CATALOG NUMBER AND SPECIFICATION. REFERENCE ND 1002034.
   - C. DISREGARD THIS NOTE IN ITS ENTIRETY IF REVERENCE IS MADE TO THIS DRAWING AT ONLY HIGHER REVISION THAN SYMBOL DASH (-).

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

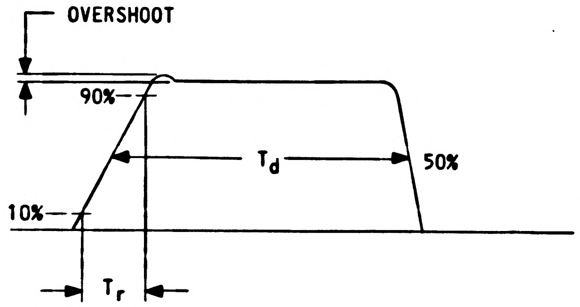


FIG. 1 CURRENT PULSE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00467 DATE 2-27-63

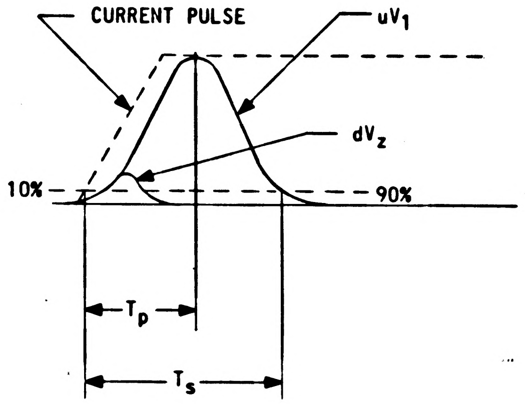
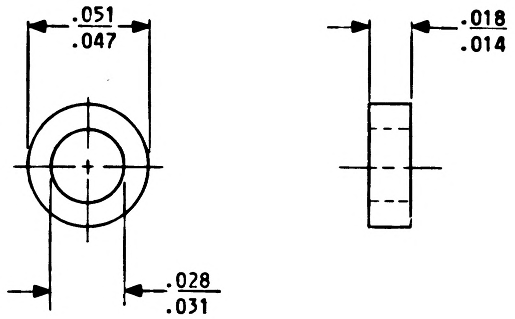


FIG. 2 VOLTAGE RESPONSE OF CORE



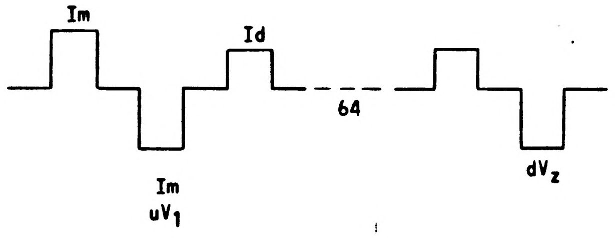


FIG. 3 CURRENT PULSE SEQUENCE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. WHEELER DATE 26DEC62
CHECKED D.M. SLEEPER 11 JAN63
APPROVAL CW Mayo 2-27-63
APPROVAL
NASA APPROVAL W J Rhine 2-27-63
MIT APPROVAL W Kupfer 27Feb63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MAGNETIC CORE, FERRITE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006786
SCALE NONE | WT | SHEET 1 OF 1

1006786

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1006787

M

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM BUWEPS DWG 2318911		
A	ADDED PROCUREMENT NOTE 2 PER TDRR 00433	2-20-63	WJB WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015401.
   - B. MARKING: THE REEL CONTAINING THE WIRE SHALL BE MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - C. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER AND FREE FROM DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.
   - D. PACKAGING: THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL WEIGHT SHALL NOT EXCEED FIFTEEN (15) POUNDS.

2. A WAIVE AS REQUIRED ALL INFORMATION PRESENTED ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC. & PHYSICAL DIMENSIONS.
   - B UPON SPECIFIC INSTRUCTION BY (TD) TECHNICAL DIRECTIVE PROCURE THIS PART AS CHANGE LETTER A BY ODERING TO VENDOR CATALOG NO. & SPECIFICATIONS. REFERENCE ND 1002034.
   - C DISREGARD THIS NOTE IN ITS ENTIRETY IF REFERENCE IS MADE TO THIS DRAWING BY OTHER THAN REVISION LETTER A.

DASH NO	AWG SIZE	OD INCHES	CONDUCTOR RESISTANCE OHMS / FOOT
1	26	.015/.017	.160/.180
2	24	.019/.021	.105/.120
3	22	.024/.026	.0672/.0770
4	20	.030/.034	.041/.047

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00085 DATE 11-8-62

MASTER

ORIGINAL SOURCE OF SUPPLY:

GENERAL ELECTRIC
CLEVELAND WELDS PLANT
CLEVELAND 10, OHIO

CODE IDENT NO. 06247

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 25 Oct 62
CHECKED 7 Nov 62
APPROVAL 7 Nov 62
APPROVAL 7 Nov 62
NASA APPROVAL 11-8-62
MIT APPROVAL 8 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL-IRON ALLOY, COPPER-CLAD
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006787

SCALE WT SHEET 1 OF 1

1006787

B 1006787

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM BUWEPS DWG 2318911		
A	ADDED PROCUREMENT NOTE 2 PER TDRR 00433	2-20-63	WK
B	REPLACED WITH CHANGE BY REV C PER TDRR 00513	6/3/63	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00085 DATE 11-8-62

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015401.
   - B. MARKING: THE REEL CONTAINING THE WIRE SHALL BE MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - C. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER AND FREE FROM DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.
   - D. PACKAGING: THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL WEIGHT SHALL NOT EXCEED FIFTEEN (15) POUNDS.

WAIVE AS REQUIRED ALL INFORMATION PRESENTED
ON THIS DRAWING EXCEPT LEAD MATERIAL SPEC.
& PHYSICAL DIMENSIONS.
UPON SPECIFIC INSTR [illegible]
[illegible] PROCURE [illegible]
LETTER A BY ODERING [illegible]
& SPECIFICATIONS. [illegible]

DISREGARD THIS NOTE IN ITS ENTIRETY IF
REFERENCE IS MADE TO THIS DRAWING BY
OTHER THAN REVISION LETTER A.

DASH NO	AWG SIZE	OD INCHES	CONDUCTOR RESISTANCE OHMS / FOOT
1	26	.015/.017	.160/.180
2	24	.019/.021	.105/.120
3	22	.024/.026	.0672/.0770
4	20	.030/.034	.041/.047

Ⓑ REPLACED WITH CHANGE BY REV C

MASTER

ORIGINAL SOURCE OF SUPPLY:

GENERAL ELECTRIC
CLEVELAND WELDS PLANT
CLEVELAND 10, OHIO

CODE IDENT NO. 06247

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Roger W Wheeler DATE 25 Oct 62
CHECKED [illegible] 9 Nov 62
APPROVAL [illegible] 7 Nov 62
APPROVAL [illegible] 7 Nov 62
NASA APPROVAL [illegible] 11-8-62
MIT APPROVAL [illegible] 8 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL-IRON ALLOY, COPPER-CLAD
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006787
SCALE
WT
SHEET 1 OF 1

1006787 B

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513	6/3/63	WR

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MATERIAL: SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015401.
   - B. MARKING: THE REEL CONTAINING THE WIRE SHALL BE MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - C. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER AND FREE FROM DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.
   - D. PACKAGING: THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL WEIGHT SHALL NOT EXCEED FIFTEEN (15) POUNDS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00085 **DATE** 11-8-62

DASH NO	AWG SIZE	OD INCHES	CONDUCTOR RESISTANCE OHMS / FOOT
1	26	.015/.017	.160/.180
2	24	.019/.021	.105/.120
3	22	.024/.026	.0672/.0770
4	20	.030/.034	.041/.047

Ⓒ REPLACES REV B WITH CHANGE

MASTER

ORIGINAL SOURCE OF SUPPLY:

GENERAL ELECTRIC
CLEVELAND WELDS PLANT
CLEVELAND 10, OHIO

CODE IDENT NO. 06247

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray W Wheeler DATE 25 Oct 62
CHECKED 7 Nov 62
APPROVAL
APPROVAL 7 Nov 62
NASA APPROVAL 11-8-62
MIT APPROVAL 8 Nov '62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL-IRON ALLOY, COPPER-CLAD
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006787
SCALE WT SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006787 D

REVISIONS B Release TDRR 00085 11/8/62

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 00513	6/3/63	WR
D	REVISED AND UPGRADED TO CLASS A RELEASE PER TDRR 01767	6/24/63	ECH WR.

(M)

NOTES:

1. GENERAL REQUIREMENTS:

   A. MATERIAL: SHALL BE IN ACCORDANCE WITH [illegible] AND PS 1015401.

   B. MARKING: THE REEL CONTAINING THE WIRE SHALL BE MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

   C. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER AND FREE FROM DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.

   D. PACKAGING: THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL WEIGHT SHALL NOT EXCEED FIFTEEN (15) POUNDS. THE REEL SHALL HAVE A HUB OF 1/2 INCH DIA MIN

   E. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q 9858.

DASH NO	AWG SIZE	OD INCHES
2	24	.019/.021
3	22	.024/.026
4	20	.031/.033

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

Ⓒ REPLACES REV B WITH CHANGE

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 1

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN Ray W Wheeler DATE 25 Oct 62
CHECKED 7 Nov 62
APPROVAL 7 Nov 62
APPROVAL 7 Nov 62
NASA APPROVAL 11-8-62
MIT APPROVAL 8 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL-IRON ALLOY, COPPER-CLAD
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006787
SCALE
WT
SHEET 1 OF 1

1006787 D

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006787

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM BUWEPS DWG 2318911		

NOTES:

1. GENERAL REQUIREMENTS:

   A. MATERIAL: SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015401.

   B. MARKING: THE REEL CONTAINING THE WIRE SHALL BE MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

   C. WORKMANSHIP: THE WIRE SHALL BE UNIFORM IN QUALITY AND TEMPER AND FREE FROM DEFECTS WHICH ARE NOT IN ACCORDANCE WITH THE BEST PRACTICE FOR HIGH QUALITY MATERIAL.

   D. PACKAGING: THE WIRE SHALL BE WOUND ON A FIVE (5) INCH REEL AND THE TOTAL WEIGHT SHALL NOT EXCEED FIFTEEN (15) POUNDS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00085 **DATE** 11-8-62

DASH NO	AWG SIZE	OD INCHES	CONDUCTOR RESISTANCE OHMS / FOOT
1	26	.015/.017	.160/.180
2	24	.019/.021	.105/.120
3	22	.024/.026	.0672/.0770
4	20	.030/.034	.041/.047

ORIGINAL SOURCE OF SUPPLY:

GENERAL ELECTRIC
CLEVELAND WELDS PLANT
CLEVELAND 10, OHIO

CODE IDENT NO. 06247

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE 1

HEAT TREATMENT: NONE

FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 25 Oct 62
CHECKED 8 Nov 62
APPROVAL 7 Nov 62
APPROVAL 7 Nov 62

NASA APPROVAL 11-8-62

MIT APPROVAL 8 Nov 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRE, ELECTRICAL
NICKEL-IRON ALLOY, COPPER-CLAD
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006787
SCALE	WT	SHEET 1 OF 1

1006787

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS "B" 00859 4-17-63

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	UPGRADED TO CLASS "A" WITH CHANGES PER TDRR 01162	8 May 63	WK.

(M)

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) LEADS SHALL BE DUMET PER ND PS 1015401.

B. ELECTRICAL CHARACTERISTICS:

(1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.

(2) RESISTANCE TOLERANCE: ± 1 PERCENT.

(3) POWER RATING: 1/4 WATT.

(4) OPERATING TEMPERATURE RANGE: -55°C TO 145°C.

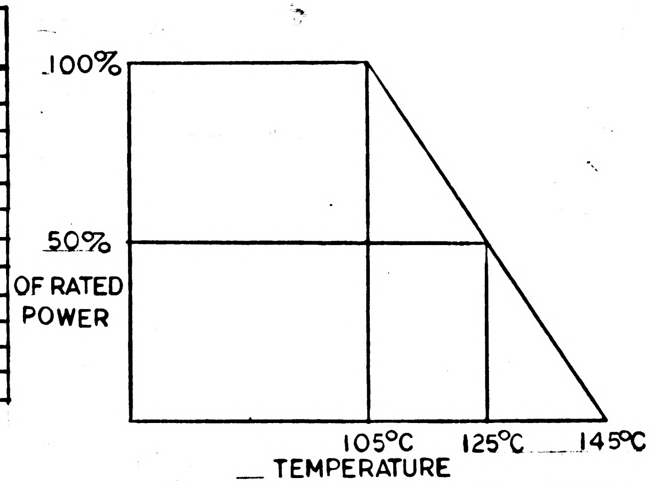
(5) TEMPERATURE COEFFICIENT: ± 20 PPM/DEGREE C.

(6) MAXIMUM CONTINUOUS WORKING VOLTAGE: 37 VOLTS.

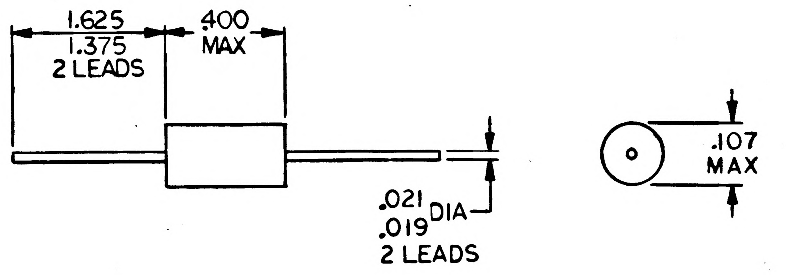
3. SPECIAL CONDITIONING BY SUPPLIER:

UNITS SHALL BE BURNED IN AT 150% OF RATED POWER @25°C FOR 48 HOURS. RESISTANCE CHANGE FROM INITIAL VALUE SHALL NOT EXCEED .06%.

DASH NO.	RESISTANCE IN OHMS
1	4.7
2	4.8
3	4.9
4	5.0
5	5.1
6	10
7	15
8	20
9	27
10	33
11	39
12	47



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN R. Kane DATE 29 Mar. 63
CHECKED [illegible] 5 APR 63
APPROVAL
APPROVAL Ellen C Hall 4/10/63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Kupfer 17 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS "B" 00859 4-17-63

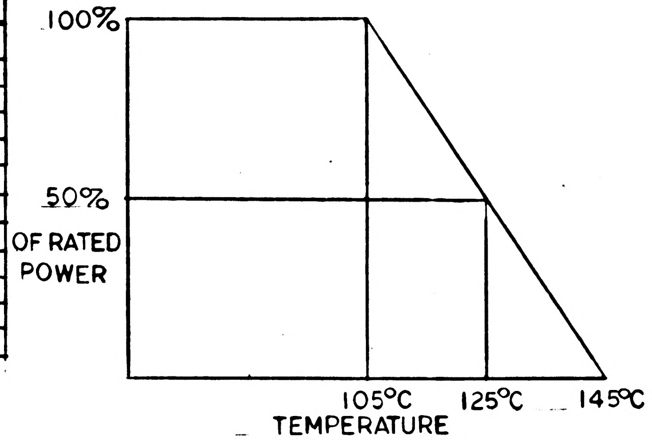
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	UPGRADED TO CLASS "A" WITH CHANGES PER TDRR 01162	8 May 63	WK.
B	REPLACED BY REV C WITH CHANGES PER TDRR 01287	5/22/63	

M
M

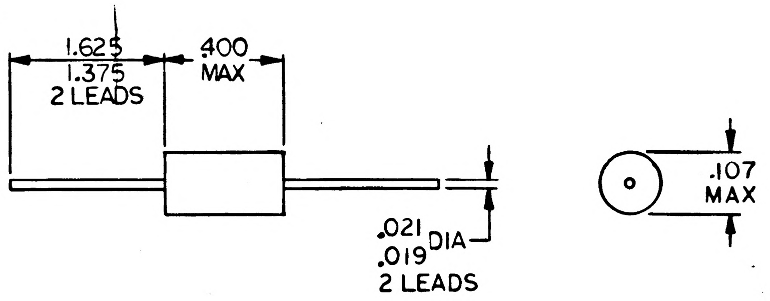
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) LEADS SHALL BE DUMET PER ND PS 1015401.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE TOLERANCE: ± 1 PERCENT.
     - (3) POWER RATING: 1/4 WATT.
     - (4) OPERATING TEMPERATURE RANGE: -55°C TO 145°C.
     - (5) TEMPERATURE COEFFICIENT: ± 20 PPM/DEGREE C.
     - (6) MAXIMUM CONTINUOUS WORKING VOLTAGE: 37 VOLTS.
3. SPECIAL CONDITIONING BY SUPPLIER:
   UNITS SHALL BE BURNED IN AT 150% OF RATED POWER @25°C FOR 48 HOURS. RESISTANCE CHANGE FROM INITIAL VALUE SHALL NOT EXCEED .06%.

DASH NO.	RESISTANCE IN OHMS
1	4.7
2	4.8
3	4.9
4	5.0
5	5.1
6	10
7	15
8	20
9	27
10	33
11	39
12	47



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓑ REPLACED BY REV C WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATI LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN R. Kane DATE 29 Mar. 63
CHECKED 8 APR 63
APPROVAL
APPROVAL Ellen C Hall 4/16/63
NASA APPROVAL Jack Barnes
MIT APPROVAL 17 Ap 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006788 C

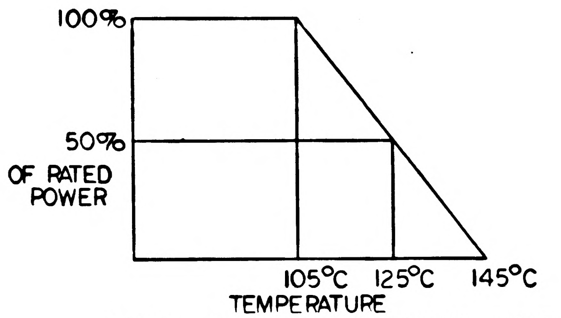
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

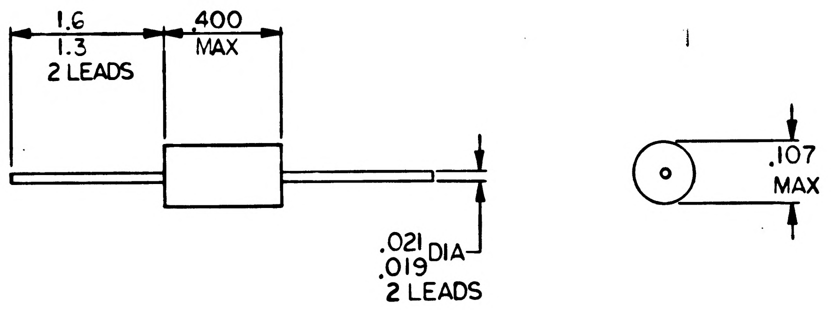
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: ±1%
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: ±20 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4,6,4. ALL PARTS NOT MEETING PARAAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

DASH NO.	RESISTANCE IN OHMS
1	4.7
2	4.8
3	4.9
4	5.0
5	5.1
6	10
7	15
8	20
9	27
10	33
11	39
12	47
13	19.5
14	20.5



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS . ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 20 May 63
CHECKED George J Reed 20 May 63
APPROVAL R T Donnell 22 May 63
APPROVAL Eldon C Hall 22 May 63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D 1006788

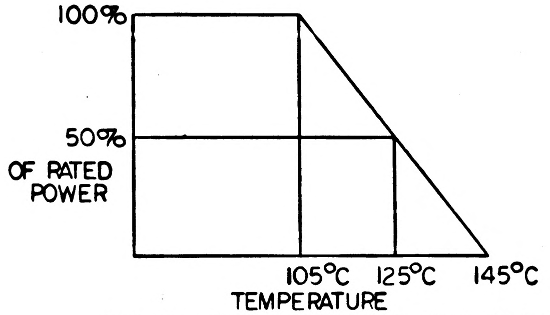
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 Jan 68	AKB

Ⓜ

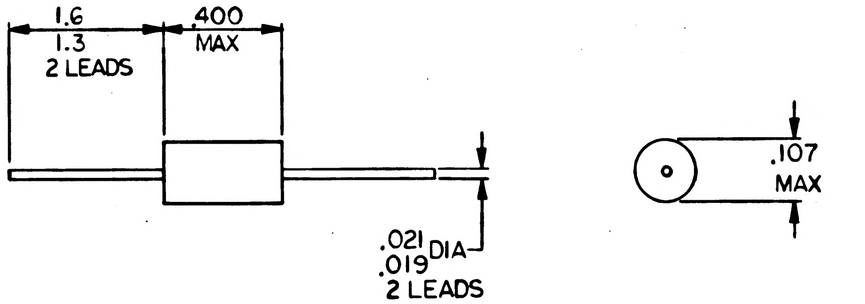
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: ±1%
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: 50 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4,6,4. ALL PARTS NOT MEETING PARAAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

DASH NO.	RESISTANCE IN OHMS
1	4.7
2	4.8
3	4.9
4	5.0
5	5.1
6	10
7	15
8	20
9	27
10	33
11	39
12	47
13	19.5
14	20.5
15	2.4



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 20 May 63
CHECKED 20 May 63
APPROVAL 22 May 63
APPROVAL Eldon C Hall 22 May 63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006788
SCALE NONE | WT | SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

E 1006788

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 Jan 65	AKB
E	REVISED PER TDRR 02619	8/14/63	WR.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: ±1%
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: 50 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

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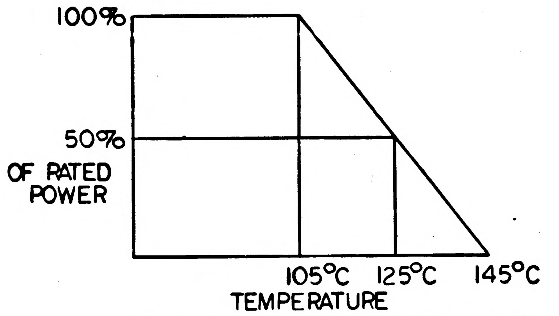
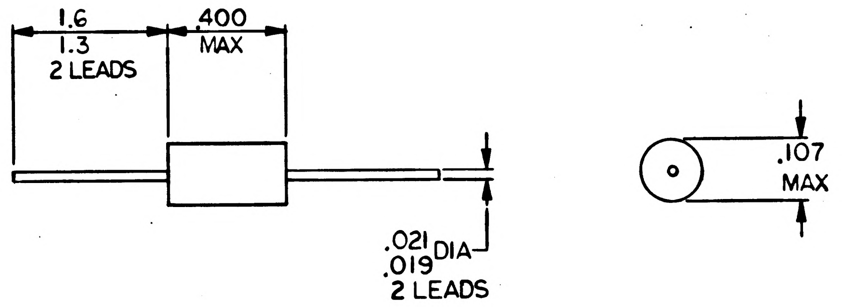
4	5.0
5	5.1
6	10
7	15
8	20
9	27
10	33
11	39
12	47
13	19.5
14	20.5
15	2.4
16	1.7
17	1.75
18	1.8
19	1.85
20	1.9
21	1.95
22	2.0
23	2.05
24	2.1
25	2.15
26	2.2
27	2.25
28	2.3



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 20 May 63
CHECKED George J. [illegible] 20 May 63
APPROVAL R T D[illegible] 22 May 63
APPROVAL Eldon C Hall 22 May 63

NASA APPROVAL [illegible] 5/22/63

MIT APPROVAL [illegible] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006788

SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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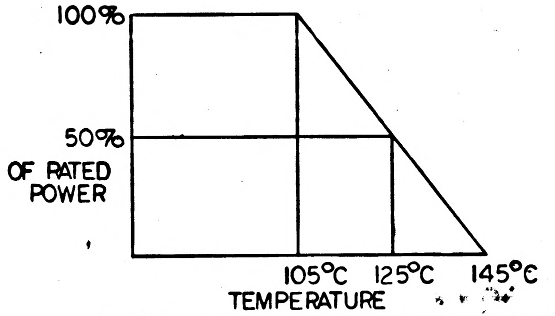
F 1006788

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 June 63	AKB
E	REVISED PER TDRR 02619	8/14/63	WR.
F	REVISED PER TDRR 03138	17 Sep 63	WR.

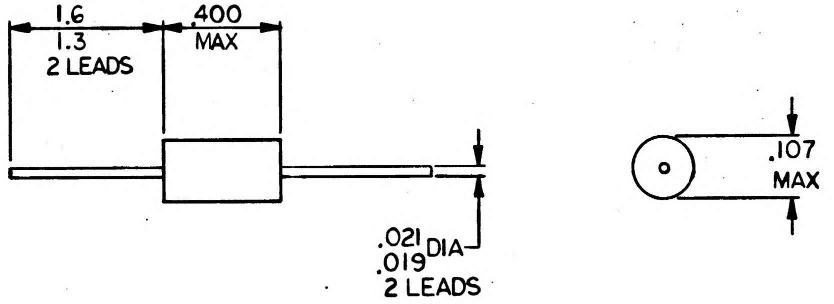
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: ±1%
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: 50 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

DASH NO.	RESISTANCE IN OHMS
1	4.7
2	4.8
3	4.9
4	5.0
5	5.1
6	10
7	15
8	20
9	27
10	33
11	39
12	47
13	19.5
14	20.5
15	2.4
16	1.7
17	1.75
18	1.8
19	1.85
20	1.9
21	1.95
22	2.0
23	2.05
24	2.1
25	2.15
26	2.2
27	2.25
28	2.3
29	2.5
30	2.6
31	2.7
32	2.8



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 20 May 63
CHECKED George J Reed 20 May 63
APPROVAL E I Dennell 22 May 63
APPROVAL Eldon C Hall 22 May 63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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G 1006788

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 June 63	AKB
E	REVISED PER TDRR 02619	8/1/63	WR.
F	REVISED PER TDRR 03138	17 Sep 63	WR.
G	REVISED PER TDRR 03998	17 Oct 63	WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL DIMENSIONS PER DRAWING.

B. ELECTRICAL:

(1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.

(2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.

(3) RESISTANCE TOLERANCE: ±1%

3. DESIGN REQUIREMENTS:

A. POWER RATING: 1/4 WATT

B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C

C. TEMPERATURE COEFFICIENT: 50 PPM/°C

4. SPECIAL CONDITIONING BY SUPPLIER:

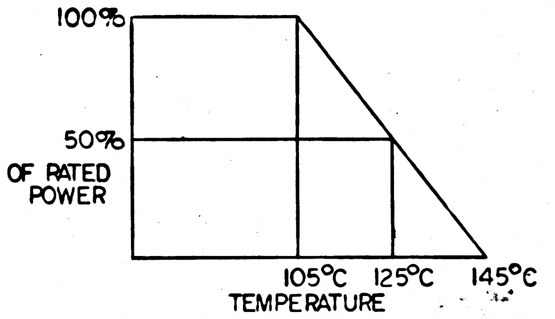
A. TEMPERATURE CYCLING

(1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4.
ALL PARTS NOT MEETING PARAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.

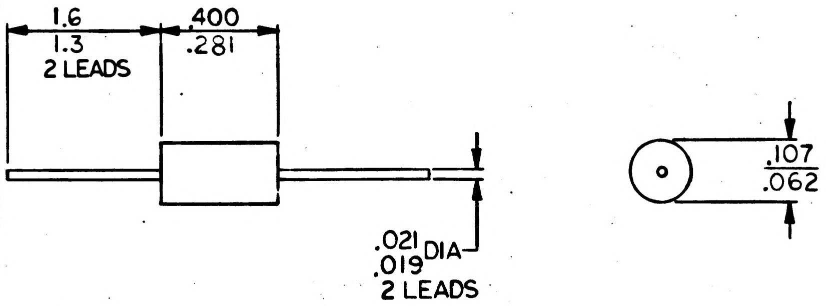
B. BURN IN:

(1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

DASH NO.	RESISTANCE IN OHMS	INDUCTANCE μH MAX
1	4.7	0.1
2	4.8	0.1
3	4.9	0.1
4	5.0	0.1
5	5.1	0.1
6	10	0.13
7	15	0.13
8	20	0.14
9	27	0.17
10	33	0.20
11	39	0.21
12	47	0.25
13	19.5	0.14
14	20.5	0.14
15	2.4	0.1
16	1.7	0.1
17	1.75	0.1
18	1.8	0.1
19	1.85	0.1
20	1.9	0.1
21	1.95	0.1
22	2.0	0.1
23	2.05	0.1
24	2.1	0.1
25	2.15	0.1
26	2.2	0.1
27	2.25	0.1
28	2.3	0.1
29	2.5	0.1
30	2.6	0.1
31	2.7	0.1
32	2.8	0.1



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



© REPLACES REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
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CHECKED George J. [illegible] 20 May 63
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APPROVAL Eldon C Hall 22 May 63
NASA APPROVAL [illegible] 5/22/63
MIT APPROVAL [illegible] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H 1006788

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12June63	AKB
E	REVISED PER TDRR 02619		WR
F	REVISED PER TDRR 03139		WR
G	REVISED PER TDRR 03998	17Oct63	WR
H	REVISED PER TDRR 05114	12/10/63	EPL

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.

D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

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2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL DIMENSIONS PER DRAWING.

B. ELECTRICAL:

(1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.

(2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.

(3) RESISTANCE TOLERANCE: ±1%

3. DESIGN REQUIREMENTS:

A. POWER RATING: 1/4 WATT

B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C

C. TEMPERATURE COEFFICIENT: 50 PPM/°C

4. SPECIAL CONDITIONING BY SUPPLIER:

A. TEMPERATURE CYCLING

(1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.

B. BURN IN:

(1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

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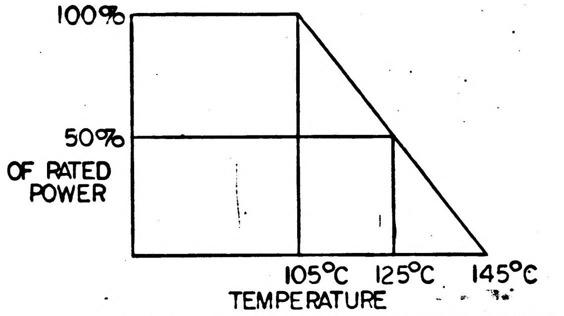
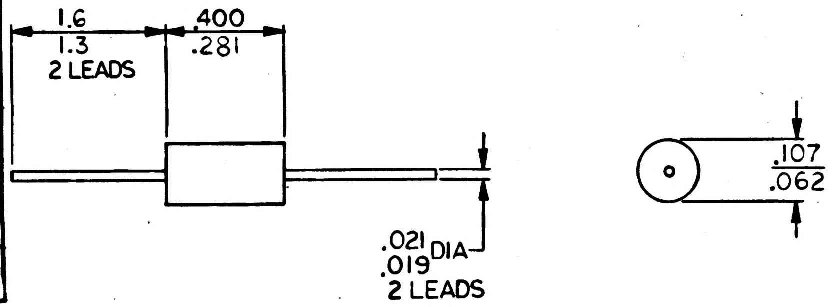
7	15	0.13
8	20	0.14
9	27	0.17
10	33	0.20
11	39	0.21
12	47	0.25
13	19.5	0.14
14	20.5	0.14
15	2.4	0.1
16	1.7	0.1
17	1.75	0.1
18	1.8	0.1
19	1.85	0.1
20	1.9	0.1
21	1.95	0.1
22	2.0	0.1
23	2.05	0.1
24	2.1	0.1
25	2.15	0.1
26	2.2	0.1
27	2.25	0.1
28	2.3	0.1
29	2.5	0.1
30	2.6	0.1
31	2.7	0.1
32	2.8	0.1
33	2.9	0.1
34	3.0	0.1
35	3.1	0.1



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



© REPLACES REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 20 May 63
CHECKED George J. [illegible] 20 May 63
APPROVAL E I Duncnell 22 May 63
APPROVAL Eldon C Hall 22 May 63
NASA APPROVAL [illegible] 5/22/63
MIT APPROVAL [illegible] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006788 J

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 June 63	AKB
E	REVISED PER TDRR 02619	8/14/63	WR
F	REVISED PER TDRR 03138	12 Sep 63	WK
G	REVISED PER TDRR 03998	17 Oct 63	WK
H	REVISED PER TDRR 05114	12/10/63	
J	REVISED PER TDRR 05371	12/27/63	WK

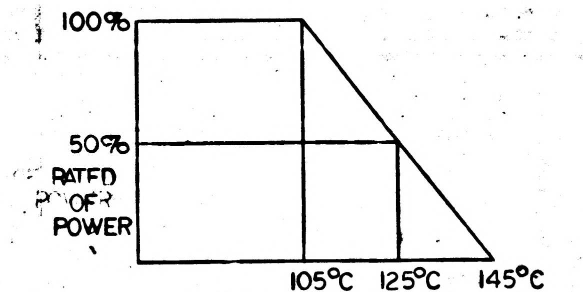
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER, AND LOT CODE.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: ±1%
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: 50 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAGRAPH 2.8.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

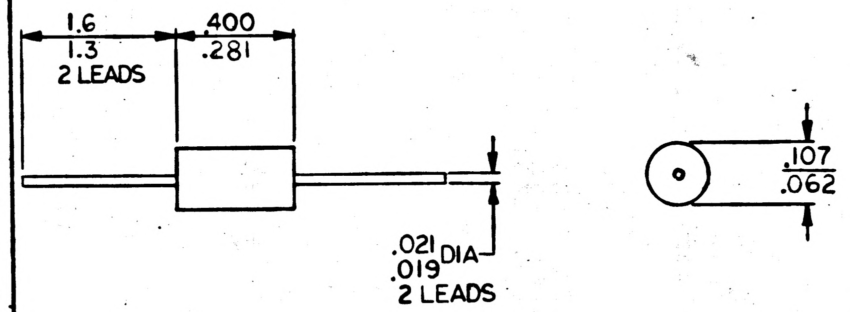
PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1082034 FOR THIS DRAWING.

DASH NO.	RESISTANCE IN OHMS	INDUCTANCE μH MAX
1	4.7	0.1
2	4.8	0.1
3	4.9	0.1
4	5.0	0.1
5	5.1	0.1
6	10	0.13
7	15	0.13
8	20	0.14
9	27	0.17
10	33	0.20
11	39	0.21
12	47	0.25
13	19.5	0.14
14	20.5	0.14
15	2.4	0.1
16	1.7	0.1
17	1.75	0.1
18	1.8	0.1
19	1.85	0.1
20	1.9	0.1
21	1.95	0.1
22	2.0	0.1
23	2.05	0.1
24	2.1	0.1
25	2.15	0.1
26	2.2	0.1
27	2.25	0.1
28	2.3	0.1
29	2.5	0.1
30	2.6	0.1
31	2.7	0.1
32	2.8	0.1
33	2.9	0.1
34	3.0	0.1
35	3.1	0.1
36	3.2	0.1
37	3.3	0.1
38	3.4	0.1
39	3.5	0.1
40	3.6	0.1
41	3.7	0.1
42	3.8	0.1
43	3.9	0.1
44	4.0	0.1
45	4.1	0.1
46	4.2	0.1

DASH NO.	RESIST. IN OHMS	INDUCTANCE uH MAX
47	4.3	0.1
48	4.4	0.1
49	4.5	0.1
50	4.6	0.1
51	1.5	0.1
52	1.55	0.1
53	1.60	0.1
54	1.65	0.1



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 20 May 63
CHECKED George J. Reed 20 May 63
APPROVAL E. I. Dunnell 22 May 63
APPROVAL Eldon C. Hall 22 May 63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006788

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006788 K

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 June 63	AKB
E	REVISED PER TDRR 02619	8/14/63	WK
F	REVISED PER TDRR 03138	12 Sep 63	WK
G	REVISED PER TDRR 03998	17 Oct 63	WK
H	REVISED PER TDRR 05114	12/10/63	EPR
J	REVISED PER TDRR 05371	12/27/63	WK
K	REVISED PER TDRR 16367	4/17/65	WK

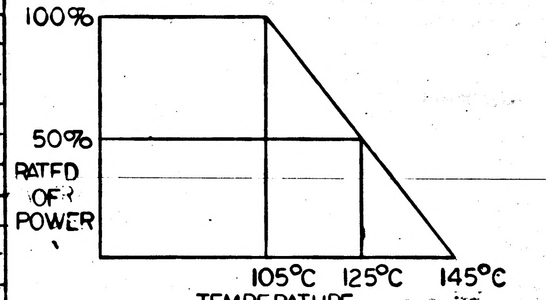
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER, AND LOT CODE.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: ±1%
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: 50 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

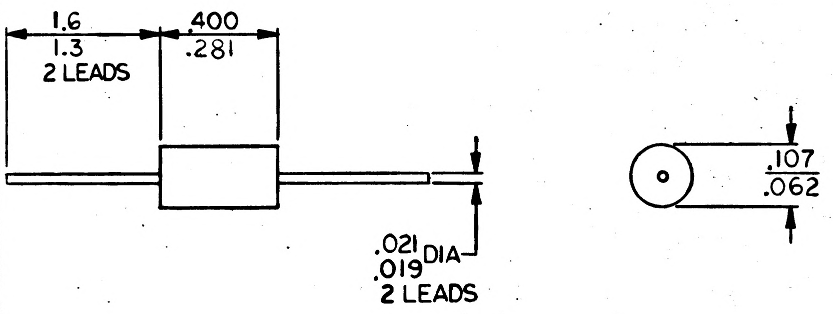
PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

DASH NO.	RESISTANCE IN OHMS	INDUCTANCE μH MAX
1	4.7	0.1
2	4.8	0.1
3	4.9	0.1
4	5.0	0.1
5	5.1	0.1
6	10	0.13
7	15	0.13
8	20	0.14
9	27	0.17
10	33	0.20
11	39	0.21
12	47	0.25
13	19.5	0.14
14	20.5	0.14
15	2.4	0.1
16	1.7	0.1
17	1.75	0.1
18	1.8	0.1
19	1.85	0.1
20	1.9	0.1
21	1.95	0.1
22	2.0	0.1
23	2.05	0.1
24	2.1	0.1
25	2.15	0.1
26	2.2	0.1
27	2.25	0.1
28	2.3	0.1
29	2.5	0.1
30	2.6	0.1
31	2.7	0.1
32	2.8	0.1
33	2.9	0.1
34	3.0	0.1
35	3.1	0.1
36	3.2	0.1
37	3.3	0.1
38	3.4	0.1
39	3.5	0.1
40	3.6	0.1
41	3.7	0.1
42	3.8	0.1
43	3.9	0.1
44	4.0	0.1
45	4.1	0.1
46	4.2	0.1

DASH NO.	RESIST. IN OHMS	INDUCTANCE uH MAX
47	4.3	0.1
48	4.4	0.1
49	4.5	0.1
50	4.6	0.1
51	1.5	0.1
52	1.55	0.1
53	1.60	0.1
54	1.65	0.1
55	5.2	0.1
56	5.4	0.1
57	5.6	0.1
58	5.8	0.1
59	6.0	0.1
60	6.3	0.1
61	6.6	0.1
62	6.9	0.1
63	7.2	0.1
64	7.5	0.1
65	8.0	0.1
66	8.5	0.1
67	9.0	0.1
68	9.5	0.1



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 20 May 63
CHECKED 20 May 63
APPROVAL 22 May 63
APPROVAL Eldon C Hall 22 May 63

NASA APPROVAL 5/22/63

MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006788
SCALE NONE	WT	SHEET 1 OF 1

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006788 L

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 June 63	AKB
E	REVISED PER TDRR 02619	8/14/63	WR
F	REVISED PER TDRR 03138	12 Sep 63	WK
G	REVISED PER TDRR 03998	17 Oct 63	WK
H	REVISED PER TDRR 05114	12/10/63	
J	REVISED PER TDRR 05371	12/27/63	WK
K	REVISED PER TDRR 16367	2/17/65	WK
L	REVISED PER TDRR 16586	4/1/65	WK

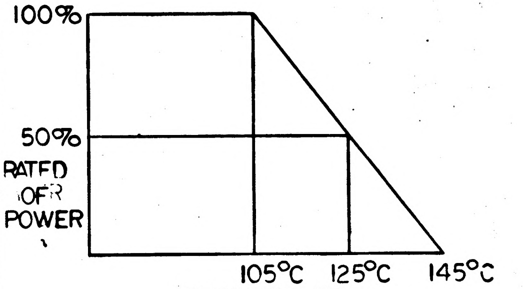
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER, AND LOT CODE.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: ±1%
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: 50 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

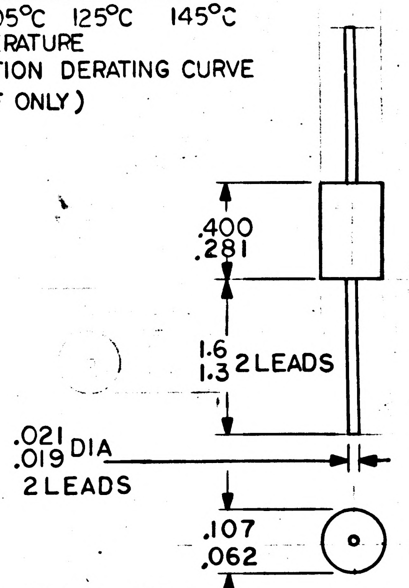
PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

DASH NO.	RESISTANCE IN OHMS	INDUCTANCE μH MAX
1	4.7	0.1
2	4.8	0.1
3	4.9	0.1
4	5.0	0.1
5	5.1	0.1
6	10	0.13
7	15	0.13
8	20	0.14
9	27	0.17
10	33	0.20
11	39	0.21
12	47	0.25
13	19.5	0.14
14	20.5	0.14
15	2.4	0.1
16	1.7	0.1
17	1.75	0.1
18	1.8	0.1
19	1.85	0.1
20	1.9	0.1
21	1.95	0.1
22	2.0	0.1
23	2.05	0.1
24	2.1	0.1
25	2.15	0.1
26	2.2	0.1
27	2.25	0.1
28	2.3	0.1
29	2.5	0.1
30	2.6	0.1
31	2.7	0.1
32	2.8	0.1
33	2.9	0.1
34	3.0	0.1
35	3.1	0.1
36	3.2	0.1
37	3.3	0.1
38	3.4	0.1
39	3.5	0.1
40	3.6	0.1
41	3.7	0.1
42	3.8	0.1
43	3.9	0.1
44	4.0	0.1
45	4.1	0.1
46	4.2	0.1

DASH NO.	RESIST. IN OHMS	INDUCTANCE uH MAX
47	4.3	0.1
48	4.4	0.1
49	4.5	0.1
50	4.6	0.1
51	1.5	0.1
52	1.55	0.1
53	1.60	0.1
54	1.65	0.1
55	5.2	0.1
56	5.4	0.1
57	5.6	0.1
58	5.8	0.1
59	6.0	0.1
60	6.3	0.1
61	6.6	0.1
62	6.9	0.1
63	7.2	0.1
64	7.5	0.1
65	8.0	0.1
66	8.5	0.1
67	9.0	0.1
68	9.5	0.1
69	2.35	0.1
70	2.45	0.1
71	2.55	0.1
72	2.65	0.1
73	2.75	0.1



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 20 May 63
CHECKED George J. [illegible] 20 May 63
APPROVAL F I Dunnell 22 May 63
APPROVAL Eldon C Hall 22 May 63
NASA APPROVAL [illegible] 5/22/63
MIT APPROVAL [illegible] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 1

MASTER

N 1006788

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404 CLASS 2.
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND1002019 WITH RESISTANCE VALUE, TOLERANCE, MANUFACTURER'S NAME/OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER, AND LOT CODE.
   - E. LEADS SHALL BE NICKEL IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL DIMENSIONS PER DRAWING.
   - B. ELECTRICAL:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE SHALL BE MEASURED 3/8 ± 1/64 INCH FROM THE RESISTOR BODY.
     - (3) RESISTANCE TOLERANCE: SEE TABLE
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/4 WATT
   - B. OPERATING TEMPERATURE RANGE: -55°C TO 145°C
   - C. TEMPERATURE COEFFICIENT: 50 PPM/°C
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. TEMPERATURE CYCLING
     - (1) ALL RESISTORS SHALL BE TEMPERATURE CYCLED IN ACCORDANCE WITH MIL-R-93 PARAGRAPH 4.6.4. ALL PARTS NOT MEETING PARAGRAPH 2.B.1, AND 3 AFTER TEST SHALL BE REJECTED.
   - B. BURN IN:
     - (1) ALL RESISTORS SHALL BE SUBJECTED TO A 50 HOUR FULL POWER BURN IN AT 125°C AMBIENT TEMPERATURE. UNITS EXHIBITING A VARIATION OF RESISTANCE IN EXCESS OF ±0.2% OR CHANGE OUTSIDE OF SPECIFIED TOLERANCE SHALL BE REJECTED. RESISTANCE SHALL BE MEASURED BEFORE AND AFTER TEST, AND DATA IDENTIFIABLE TO EACH RESISTOR SUPPLIED WITH EACH SHIPMENT.

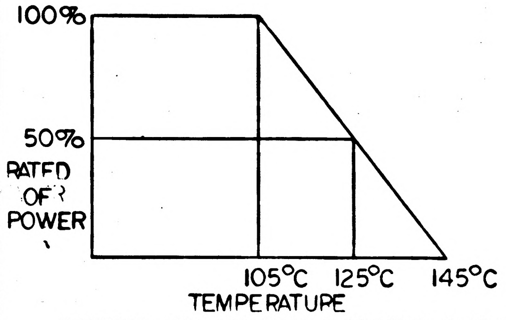
PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

DASH NO.	RESISTANCE IN OHMS	INDUCTANCE μH MAX	TOL
1	4.7	0.1	±1%
2	4.8	0.1	
3	4.9	0.1	
4	5.0	0.1	
5	5.1	0.1	
6	10	0.13	
7	15	0.13	
8	20	0.14	
9	27	0.17	
10	33	0.20	
11	39	0.21	
12	47	0.25	
13	19.5	0.14	
14	20.5	0.14	
15	2.4	0.1	
16	1.7	0.1	
17	1.75	0.1	
18	1.8	0.1	
19	1.85	0.1	
20	1.9	0.1	
21	1.95	0.1	
22	2.0	0.1	
23	2.05	0.1	
24	2.1	0.1	
25	2.15	0.1	
26	2.2	0.1	
27	2.25	0.1	
28	2.3	0.1	
29	2.5	0.1	
30	2.6	0.1	
31	2.7	0.1	
32	2.8	0.1	
33	2.9	0.1	
34	3.0	0.1	
35	3.1	0.1	
36	3.2	0.1	
37	3.3	0.1	
38	3.4	0.1	
39	3.5	0.1	
40	3.6	0.1	
41	3.7	0.1	
42	3.8	0.1	
43	3.9	0.1	
44	4.0	0.1	
45	4.1	0.1	
46	4.2	0.1	

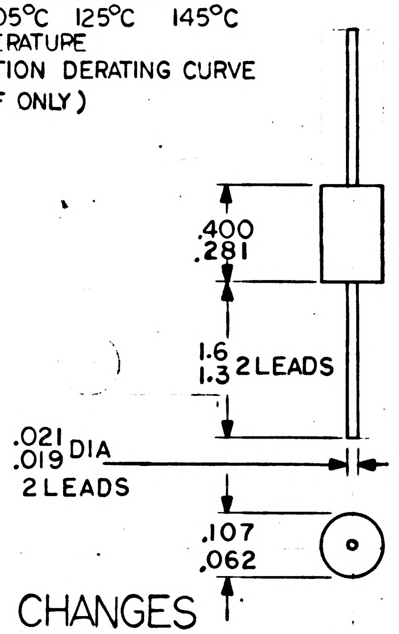
DASH NO.	RESIST. IN OHMS	INDUCT uH MAX	TOL
47	4.3	0.1	±1%
48	4.4	0.1	
49	4.5	0.1	
50	4.6	0.1	
51	1.5	0.1	
52	1.55	0.1	
53	1.60	0.1	
54	1.65	0.1	
55	5.2	0.1	
56	5.4	0.1	
57	5.6	0.1	
58	5.8	0.1	
59	6.0	0.1	
60	6.3	0.1	
61	6.6	0.1	
62	6.9	0.1	
63	7.2	0.1	
64	7.5	0.1	
65	8.0	0.1	
66	8.5	0.1	
67	9.0	0.1	
68	9.5	0.1	
69	2.35	0.1	
70	2.45	0.1	
71	2.55	0.1	
72	2.65	0.1	
73	2.75	0.1	

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGES PER TDRR 01287	5/22/63	
D	REVISED PER TDRR 01557	12 Jun 63	AKB
E	REVISED PER TDRR 02619	8/14/63	WK
F	REVISED PER TDRR 03138	12 Sep 63	WK
G	REVISED PER TDRR 03998	17 Oct 63	WK
H	REVISED PER TDRR 05114	12/10/63	
J	REVISED PER TDRR 05371	12/27/63	WK
K	REVISED PER TDRR 16367	2/17/65	WK
L	REVISED PER TDRR 16586	4/1/65	WK
M	REVISED PER TDRR 18748	6/15/65	WK
N	REVISED PER TDRR 24691	12/21/65	WK



DESIGN APPLICATION DERATING CURVE
(REF ONLY)



Ⓒ REPLACES REV B WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 20 May 63
CHECKED 20 May 63
APPROVAL E T Driscoll 22 May 63
APPROVAL Eldon C Hall 22 May 63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006788
SCALE NONE
WT
SHEET 1 OF 2

MASTER

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
M		THIS SHEET ADDED PER TDRR 18748	FB 15 MAY 1965		6/15/65	WK
N		REVISED PER TDRR 24691			12/21/65	WK

DASH NO	RES IN OHMS	TOL	INDUCT μH MAX
74	1.00		
75	1.01	↑	↑
76	1.02		
77	1.04		
78	1.05		
79	1.06		
80	1.07		
81	1.09		
82	1.10		
83	1.11		
84	1.13		
85	1.14	±0.5%	0.1
86	1.15		
87	1.17		
88	1.18		
89	1.20		
90	1.21		
91	1.23		
92	1.24		
93	1.26		
94	1.27		
95	1.29		
96	1.30		
97	1.32		
98	1.33		
99	1.35		
100	1.37		
101	1.38		
102	1.40		
103	1.42	↓	↓
104	1.43		
105	1.45		

DASH NO	RES IN OHMS	TOL	INDUCT μH MAX
106	1.47		
107	1.49	↑	↑
108	1.50		
109	1.52		
110	1.54		
111	1.56		
112	1.58		
113	1.60		
114	1.62		
115	1.64		
116	1.65		
117	1.67	±0.5%	0.1
118	1.69		
119	1.72		
120	1.74		
121	1.76		
122	1.78		
123	1.80		
124	1.82		
125	1.84		
126	1.87		
127	1.89		
128	1.91		
129	1.93		
130	1.96		
131	1.98		
132	2.00		
133	2.03		
134	2.05		
135	2.08	↓	↓
136	2.10		
137	2.13		

DASH NO	RES IN OHMS	TOL	INDUCT μH MAX
138	2.15		
139	2.18	↑	↑
140	2.21		
141	2.23		
142	2.26		
143	2.29		
144	2.32		
145	2.34		
146	2.37		
147	2.40		
148	2.43		
149	2.46	±0.5%	0.1
150	2.49		
151	2.52		
152	2.55		
153	2.58		
154	2.61		
155	2.64		
156	2.67		
157	2.71		
158	2.74		
159	2.77		
160	2.80		
161	2.84		
162	2.87		
163	2.91		
164	2.94		
165	2.98		
166	3.01		
167	3.05	↓	↓
168	3.09		
169	3.12		

DASH NO	RES IN OHMS	TOL	INDUCT μH MAX
170	3.16		
171	3.20	↑	↑
172	3.24		
173	3.28		
174	3.32		
175	3.36		
176	3.40		
177	3.44		
178	3.48		
179	3.52		
180	3.57		
181	3.61	±0.5%	0.1
182	3.65		
183	3.70		
184	3.74		
185	3.79		
186	3.83		
187	3.88		
188	3.92		
189	3.97		
190	4.02		
191	4.07		
192	4.12		
193	4.17		
194	4.22		
195	4.27		
196	4.32		
197	4.37		
198	4.42		
199	4.48	↓	↓
200	4.53		
201	4.59		

DASH NO	RES IN OHMS	TOL	INDUCT μH MAX
202	4.64		
203	4.70	↑	↑
204	4.75		
205	4.81		
206	4.87		
207	4.93		
208	4.99		
209	5.05		
210	5.11		
211	5.17		
212	5.23		
213	5.30	±0.5%	0.1
214	5.36		
215	5.42		
216	5.49		
217	5.56		
218	5.62		
219	5.69		
220	5.76		
221	5.83		
222	5.90		
223	5.97		
224	6.04		
225	6.12		
226	6.19		
227	6.26		
228	6.34		
229	6.42		
230	6.49		
231	6.57	↓	↓
232	6.65		
233	6.73		

DASH NO.	RES IN OHMS	TOL.	INDUCT μH MAX
234	6.81		
235	6.90	↑	↑
236	6.98		
237	7.06		
238	7.15		
239	7.23		
240	7.32		
241	7.41		
242	7.50		
243	7.59		
244	7.68		
245	7.77	±.5%	0.1
246	7.87		
247	7.96		
248	8.06		
249	8.16		
250	8.25		
251	8.35		
252	8.45		
253	8.56		
254	8.66		
255	8.76		
256	8.87		
257	8.98		
258	9.09		
259	9.20		
260	9.31		
261	9.42		
262	9.53		
263	9.65	↓	↓
264	9.76		
265	9.88		

DASH NO.	RES. IN OHMS	TOL.	INDUCT μH MAX
266	10.0		
267	10.1	↑	↑
268	10.2		
269	10.4		
270	10.5		
271	10.6		
272	10.7		
273	10.9		
274	11.0		
275	11.1		
276	11.3		
277	11.4	±.5%	0.15
278	11.5		
279	11.7		
280	11.8		
281	12.0		
282	12.1		
283	12.3		
284	12.4		
285	12.6		
286	12.7		
287	12.9		
288	13.0		
289	13.2		
290	13.3		
291	13.5		
292	13.7		
293	13.8		
294	14.0		
295	14.2		
296	14.3	↓	↓
297	14.5		

DASH NO.	RES IN OHMS	TOL.	INDUCT μH MAX.
298	14.7		
299	14.9	↑	↑
300	15.0		
301	15.2		
302	15.4		
303	15.6		
304	15.8		
305	16.0		
306	16.2		
307	16.4		
308	16.5		
309	16.7	±.5%	0.15
310	16.9		
311	17.2		
312	17.4		
313	17.6		
314	17.8		
315	18.0		
316	18.2		
317	18.4		
318	18.7		
319	18.9		
320	19.1		
321	19.3		
322	19.6		
323	19.8		
324	20.0		
325	20.3		
326	20.5		
327	20.8		
328	21.0	↓	↓
329	21.3		

Ⓜ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± —— ± —— ± ——
DO NOT SCALE THIS DRAWING

MATERIAL

SEE NOTES (SHT 1)

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	Tony Bell	14 Nov 65
CHECKED	A. Marts	6-14-65
APPROVED		
APPROVED	Ella C. Hall	14 June 65
APPROVED MIT	W. Kupfer	6/15/65
APPROVED MSC		6/15/65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006788

SCALE NONE

SHEET 2 OF 2

MASTER

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006788

SYM	DESCRIPTION	DATE	APPROVAL
—			

REVISIONS

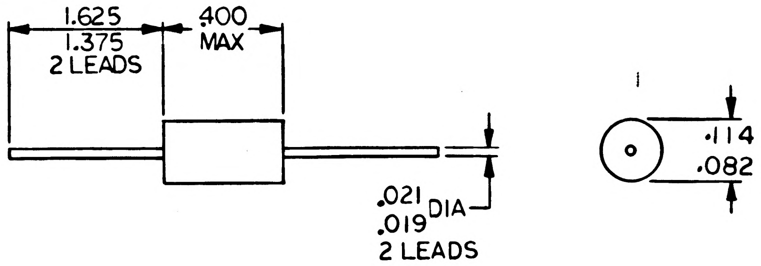
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH ANY ADDITIONS AND EXCEPTIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002057.
   - E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH RESISTANCE VALUE, TOLERANCE, POWER RATING, MANUFACTURER'S NAME OR SYMBOL AND TYPE NUMBER. THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) LEADS SHALL BE NICKEL ALLOY PER NASA DOCUMENT PS 1015400.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) RESISTANCE SHALL BE AS SPECIFIED IN TABLE.
     - (2) RESISTANCE TOLERANCE: ± 1 PERCENT.
     - (3) POWER RATING: 1/8 WATT.
     - (4) OPERATING TEMPERATURE RANGE: -55°C TO 145°C.
     - (5) TEMPERATURE COEFFICIENT: ± 20 PPM/DEGREE C.
     - (6) MAXIMUM CONTINUOUS WORKING VOLTAGE: 37 VOLTS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00859 **DATE** 17 Apr 63

DASH NO.	RESISTANCE IN OHMS
1	4.7
2	4.8
3	4.9
4	5.0
5	5.1



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 29 Mar 63
CHECKED [illegible] / H. Maynard 8 APR 63
APPROVAL
APPROVAL Ellen C Hall 4/10/63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Kupfer 17 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006788
SCALE NONE WT SHEET 1 OF 1

1006788

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006789 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS B RELEASE PER TDRR		
A	REPLACED BY REV B PER TDRR 02835	8/24/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-C-3965, CHARACTERISTIC B, VIBRATION GRADE 3; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C, DERATED 15% AT +105°C.
2. ELECTRICAL REQUIREMENTS:
   - A. RATINGS: PER TABLE.
3. CONSTRUCTION REQUIREMENTS:
   - A. INSULATION SLEEVE: MYLAR.
   - B. LEADS: NICKEL ALLOY PER NASA SPECIFICATION PS 1015400.
     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - C. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, VOLTAGE, CAPACITANCE, TOLERANCE, AND POLARITY.
     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
4. QUALITY ASSURANCE REQUIREMENTS:
   - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN NASA SPECIFICATION ND 1015404, CLASS 2.
5. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

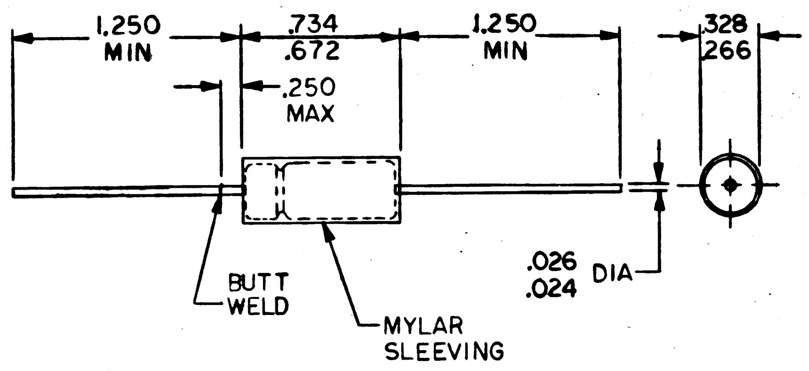
TABLE - ELECTRICAL RATINGS

NASA DASH NO	CAPACITANCE (uF)	CAPACITANCE TOLERANCE (%)	*MAX. WORKING VOLTAGE (VOLTS DC)	MAX. ESR @ +25°C (OHMS)	MAX. DC LEAKAGE CURRENT (uA)		MAX. IMPEDANCE @ -55°C (OHMS)	MAX CAPACITANCE CHANGE (%)	
					+25°C	+85°C		-55°C	+85°C
001	25	10	50	7	2.5	31.25	70	-35	+25
002	47	10	50	6	4.7	58.75	90	-25	+20
003	100	10	10	3	2.0	25.0	60	-45	+20

* SURGE VOLTAGE IS 115% OF RATED DC WORKING VOLTAGE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00497 ..E
3-6-63



Ⓐ REPLACED BY REV B WITH CHANGES

ORIGINAL SOURCE OF SUPPLY:

PER QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 25 Feb 63
CHECKED
APPROVAL 3/6/63
APPROVAL
NASA APPROVAL
MIT APPROVAL W. Cuffer 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPCITOR, FIXED, ELECTROLYTIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006789
SCALE NONE
WT
SHEET 1 OF 1

1006789 A

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

00497

B 1006789

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

GENERAL:

INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.

SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.

UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002044 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

UNITS SHALL BE PACKAGED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:

- EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
- LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
- BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE, HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.

UNITS SHALL BE CAPABLE OF MEETING REQUIREMENTS OF MIL-C-3965, CHARACTERISTIC B, VIBRATION GRADE 3.

INSPECTION AND ACCEPTANCE:

MECHANICAL REQUIREMENTS:

DIMENSIONS PER OUTLINE

LEAD DATA: NICKEL ALLOY PER ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER AND SERIAL NUMBER TO SIGNIFY COMPLETION OF BURN-IN. IF SPACE PERMITS, MANUFACTURER'S PART NUMBER, CAPACITANCE VALUE, TOLERANCE AND VOLTAGE MAY ALSO BE MARKED ON PART. EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER.

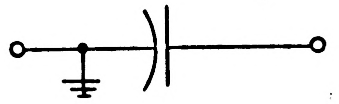
ELECTRICAL REQUIREMENTS:

CAPACITANCE: PER TABLE I. CAPACITANCE MEASUREMENTS SHALL BE MADE BY MEANS OF A POLARIZED CAPACITANCE BRIDGE. THE MAXIMUM VOLTAGE APPLIED TO THE CAPACITORS DURING MEASUREMENT SHALL BE 2 VOLTS RMS AT 120 CYCLES PER SECOND AT 25°C. MEASRUEMENT ACCURACY OF THE BRIDGE SHALL BE WITHIN ±3%.

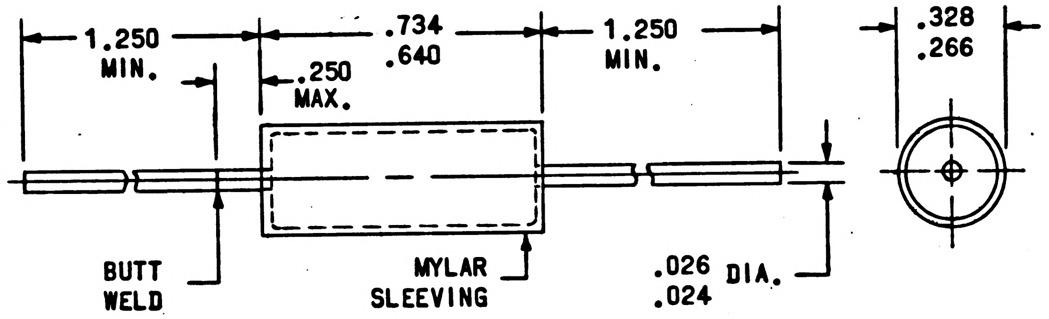
CAPACITANCE TOLERANCE: ±10% AT 25°C AND 120CPS.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER



GRAPHICAL SYMBOL



B	B
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

Ⓑ REPLACES REV (A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT NAS 9-497
DRAWN D. Matley DATE 6 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL for G. MAYO 8/28/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED (TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006789
SCALE NONE WT SHEET 1 OF 2

6

1006789 B

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 00497			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	6/25/63	

ELECTRICAL REQUIREMENTS (CONTINUED):

EQUIVALENT SERIES RESISTANCE: PER TABLE I.

LEAKAGE CURRENT: PER TABLE I MEASUREMENTS SHALL BE MADE AT RATED WORKING VOLTAGE AT THE APPLICABLE TEMPERATURE WITH AN APPLICATION OF A STEADY SOURCE OF POWER, SUCH AS A REGULATED POWER SUPPLY WITH A 1000 OHM RESISTANCE TO LIMIT THE CHARGING CURRENT CONNECTED IN SERIES WITH EACH CAPACITOR UNDER TEST. RATED WORKING VOLTAGE SHALL BE APPLIED TO CAPACITORS FOR 5 MINUTES BEFORE MAKING LEAKAGE CURRENT MEASUREMENTS.

IMPEDANCE AT -55°C: PER TABLE I

CAPACITANCE CHANGE AT -55°C AND +85°C PER TABLE I.

DESIGN REQUIREMENTS:

DC WORKING VOLTAGE: PER TABLE I

OPERATING AMBIENT TEMPERATURE RANGE: -55°C TO +85°C AT RATED VOLTAGE DERATED TO 85% OF RATED VOLTAGE AT +105°C.

LEAD STRENGTH: LEADS SHALL WITHSTAND A 3 POUND AXIAL PULL FOR 1 MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE - WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL POSITION. BEND THE NETWORK BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK 90° TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.

SPECIAL CONDITIONING BY SUPPLIER:

BURN-IN: ALL CAPACITORS SHALL BE BURNED IN FOR 250 HOURS MIN. AT THE RATED DC WORKING VOLTAGE AT A TEMPERATURE OF +85°C. -POLARITY TO BE REVERSED AT THE END OF 125 HOURS.

THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:

- CAPACITANCE
- EQUIVALENT SERIES RESISTANCE
- DC LEAKAGE

BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT.

THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING, THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS, OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN, SHALL NOT BE ACCEPTABLE.

PARAMETRIC CHANGE LIMITS:

CAPACITANCE: ±10% OF INITIAL VALUE

EQUIVALENT SERIES RESISTANCE: INITIAL REQUIREMENTS

DC LEAKAGE: 125% MAX. OF INITIAL REQUIREMENTS.

MASTER

TABLE I

NASA DASH NO.	CAPACITANCE (uF)	*MAX. WORKING VOLTAGE a 85°C (VOLTS DC)	MAX. ESR +25°C (OHMS)	MAX. DC LEAKAGE CURRENT (uA)	
				+25°C	+85°C
1006789-001	25	50	7	2.5	12.5
1006789-002	47	50	6	4.7	23.5
1006789-003	100	10	3	2.0	10.0

*SURGE VOLTAGE IS 115% OF RATED DC WORKING VOLTAGE

TABLE I (CONTINUED)

MAX. IMPEDANCE -55°C (OHMS)	MAX CAPACITANCE CHANGE (%)		MANUFACTURER'S PART NUMBER
	-55°C	+85°C	
90	-25	+20	TO BE ASSIGNED BY SUPPLIER
70	-35	+25	
60	-45	+30	

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

Ⓑ REPLACES REV(A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO
CONTRACT NAS 9-497
DRAWN G. L. Jacobs DATE 8 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL Ag for G. MAYO 8/20/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED
(TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006789
SCALE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

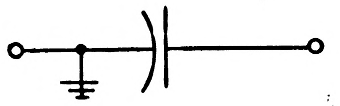
00497

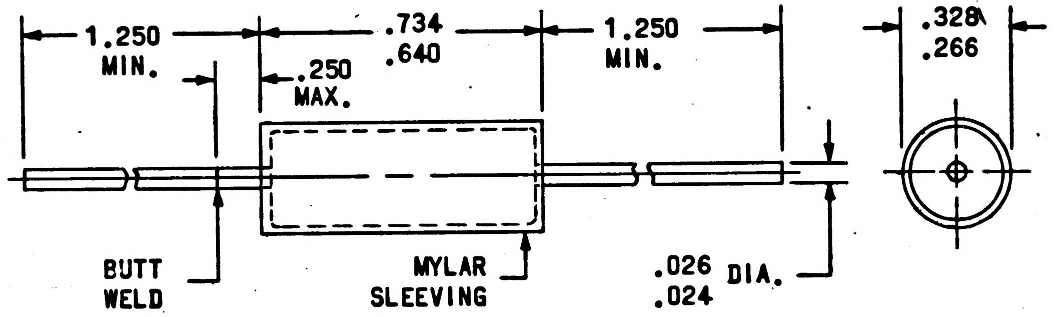
	REVISIONS		
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	
C	REVISED PER TDRR 04909	12/10/63	

Ⓜ
Ⓚ

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002044 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. UNITS SHALL BE PACKAGED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - (1) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - (2) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - (3) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE, HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL BE CAPABLE OF MEETING REQUIREMENTS OF MIL-C-3965, CHARACTERISTIC B, VIBRATION GRADE 3.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS PER OUTLINE
     - (2) LEAD DATA: NICKEL ALLOY PER ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER AND SERIAL NUMBER TO SIGNIFY COMPLETION OF BURN-IN. IF SPACE PERMITS, MANUFACTURER'S PART NUMBER, CAPACITANCE VALUE, TOLERANCE AND VOLTAGE MAY ALSO BE MARKED ON PART. EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CAPACITANCE: PER TABLE I. CAPACITANCE MEASUREMENTS SHALL BE MADE BY MEANS OF A POLARIZED CAPACITANCE BRIDGE. THE MAXIMUM VOLTAGE APPLIED TO THE CAPACITORS DURING MEASUREMENT SHALL BE 2 VOLTS RMS AT 120 CYCLES PER SECOND AT 25°C. MEASRUEMENT ACCURACY OF THE BRIDGE SHALL BE WITHIN ±3%.
     - (2) CAPACITANCE TOLERANCE: ±10% AT 25°C AND 120CPS.


GRAPHICAL SYMBOL



C	C
B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓑ REPLACES REV (A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL: SEE REQUIREMENTS
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT NAS 9-497
DRAWN D. McKay DATE 6 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL G. MAYO 8/28/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED (TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006789
SCALE NONE
WT
SHEET 1 OF 2

6

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 00497

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	
C	REVISED PER TDRR 04909	12/10/63	RAR

ELECTRICAL REQUIREMENTS (CONTINUED):

(3) EQUIVALENT SERIES RESISTANCE: PER TABLE I.

(4) LEAKAGE CURRENT: PER TABLE I MEASUREMENTS SHALL BE MADE AT RATED WORKING VOLTAGE AT THE APPLICABLE TEMPERATURE WITH AN APPLICATION OF A STEADY SOURCE OF POWER, SUCH AS A REGULATED POWER SUPPLY WITH A 1000 OHM RESISTANCE TO LIMIT THE CHARGING CURRENT CONNECTED IN SERIES WITH EACH CAPACITOR UNDER TEST. RATED WORKING VOLTAGE SHALL BE APPLIED TO CAPACITORS FOR 5 MINUTES BEFORE MAKING LEAKAGE CURRENT MEASUREMENTS.

(5) IMPEDANCE AT -55°C: PER TABLE I

(6) CAPACITANCE CHANGE AT -55°C AND +85°C PER TABLE I.

3. DESIGN REQUIREMENTS:

A. DC WORKING VOLTAGE: PER TABLE I

B. OPERATING AMBIENT TEMPERATURE RANGE: -55°C TO +85°C AT RATED VOLTAGE DERATED TO 85% OF RATED VOLTAGE AT +105°C.

C. LEAD STRENGTH: LEADS SHALL WITHSTAND A 3 POUND AXIAL PULL FOR 1 MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE - WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL POSITION. BEND THE NETWORK BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK 90° TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL CAPACITORS SHALL BE BURNED IN FOR 250 HOURS MIN. AT THE RATED DC WORKING VOLTAGE AT A TEMPERATURE OF +85°C.

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:
(1) CAPACITANCE
(2) EQUIVALENT SERIES RESISTANCE
(3) DC LEAKAGE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT.

D. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING, THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS, OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN, SHALL NOT BE ACCEPTABLE.

(1) PARAMETRIC CHANGE LIMITS:
a. CAPACITANCE: ±10% OF INITIAL VALUE
b. EQUIVALENT SERIES RESISTANCE: INITIAL REQUIREMENTS

(2) DC LEAKAGE: 125% MAX. OF INITIAL REQUIREMENTS.

MASTER

TABLE I

NASA DASH NO.	CAPACITANCE (uF)	*MAX. WORKING VOLTAGE a 85°C (VOLTS DC)	MAX. ESR +25°C (OHMS)	MAX. DC LEAKAGE CURRENT (uA)	
				+25°C	+65°C
1006789-001	25	50	7	2.5	12.5
1006789-002	47	50	6	4.7	23.5
1006789-003	100	10	3	2.0	10.0

*SURGE VOLTAGE IS 115% OF RATED DC WORKING VOLTAGE

TABLE I (CONTINUED)

MAX. IMPEDANCE -55°C (OHMS)	MAX CAPACITANCE CHANGE (%)		MANUFACTURER'S PART NUMBER
	-55°C	+85°C	
90	-25	+20	TO BE ASSIGNED BY SUPPLIER
70	-35	+25	
60	-45	+30	

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

Ⓑ REPLACES REV(A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT NAS 9-497
DRAWN G. L. Jacobs DATE 8 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL Ag for G. MAYO 8/20/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED
(TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006789
SCALE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D | 1006789

00497

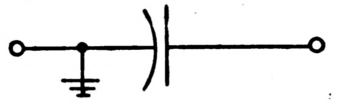
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	
C	REVISED PER TDRR 04909	12/10/63	EPK
D	REVISED PER TDRR 05625	1/7/64	EPK

REQUIREMENTS:

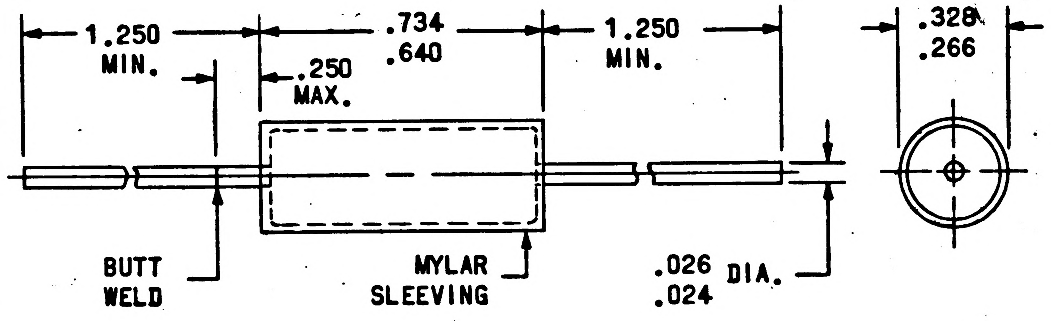
1. GENERAL:
   - A. INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002044 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. UNITS SHALL BE PACKAGED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - (1) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - (2) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - (3) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE, HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL BE CAPABLE OF MEETING REQUIREMENTS OF MIL-C-3965, CHARACTERISTIC B, VIBRATION GRADE 3.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS PER OUTLINE
     - (2) LEAD DATA: NICKEL ALLOY PER ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER AND SERIAL NUMBER TO SIGNIFY COMPLETION OF BURN-IN. IF SPACE PERMITS, MANUFACTURER'S PART NUMBER, CAPACITANCE VALUE, TOLERANCE AND VOLTAGE MAY ALSO BE MARKED ON PART. EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CAPACITANCE: PER TABLE I. CAPACITANCE MEASUREMENTS SHALL BE MADE BY MEANS OF A POLARIZED CAPACITANCE BRIDGE. THE MAXIMUM VOLTAGE APPLIED TO THE CAPACITORS DURING MEASUREMENT SHALL BE 2 VOLTS RMS AT 120 CYCLES PER SECOND AT 25°C. MEASRUEMENT ACCURACY OF THE BRIDGE SHALL BE WITHIN ±3%.
     - (2) CAPACITANCE TOLERANCE: ±10% AT 25°C AND 120CPS.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER



GRAPHICAL SYMBOL



D	D	D
C	C	—
B	B	—
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

Ⓑ REPLACES REV(A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL: SEE REQUIREMENTS
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT NAS 9-497
DRAWN D. Matley DATE 6 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL G. MAYO 8/28/63
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED (TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006789
SCALE NONE
WT
SHEET 1 OF 3

6

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

D 1006789

REVISIONS 00497			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	
C	REVISED PER TDRR 04909	12/10/63	
D	REVISED PER TDRR 05625	1/7/64	

ELECTRICAL REQUIREMENTS (CONTINUED):

(3) EQUIVALENT SERIES RESISTANCE: PER TABLE I.

(4) LEAKAGE CURRENT: PER TABLE I MEASUREMENTS SHALL BE MADE AT RATED WORKING VOLTAGE AT THE APPLICABLE TEMPERATURE WITH AN APPLICATION OF A STEADY SOURCE OF POWER, SUCH AS A REGULATED POWER SUPPLY WITH A 1000 OHM RESISTANCE TO LIMIT THE CHARGING CURRENT CONNECTED IN SERIES WITH EACH CAPACITOR UNDER TEST. RATED WORKING VOLTAGE SHALL BE APPLIED TO CAPACITORS FOR 5 MINUTES BEFORE MAKING LEAKAGE CURRENT MEASUREMENTS.

(5) IMPEDANCE AT -55°C: PER TABLE I

(6) CAPACITANCE CHANGE AT -55°C AND +85°C PER TABLE I.

3. DESIGN REQUIREMENTS:

A. DC WORKING VOLTAGE: PER TABLE I

B. OPERATING AMBIENT TEMPERATURE RANGE: -55°C TO +85°C AT RATED VOLTAGE DERATED TO 85% OF RATED VOLTAGE AT +105°C.

C. LEAD STRENGTH: LEADS SHALL WITHSTAND A 3 POUND AXIAL PULL FOR 1 MINUTE. THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE - WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL POSITION. BEND THE NETWORK BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK 90° TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL CAPACITORS SHALL BE BURNED IN FOR 250 HOURS MIN. AT THE RATED DC WORKING VOLTAGE AT A TEMPERATURE OF +85°C.

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:

(1) CAPACITANCE
(2) EQUIVALENT SERIES RESISTANCE
(3) DC LEAKAGE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT.

D. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING, THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS, OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN, SHALL NOT BE ACCEPTABLE.

(1) PARAMETRIC CHANGE LIMITS:
  a. CAPACITANCE: ±10% OF INITIAL VALUE
  b. EQUIVALENT SERIES RESISTANCE: INITIAL REQUIREMENTS

(2) DC LEAKAGE: 125% MAX. OF INITIAL REQUIREMENTS.

MASTER

Ⓑ REPLACES REV(A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO.
CONTRACT NAS 9-497
DRAWN G. L. Jacobs DATE 8 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL Ay for G. MAYO 8/28/63
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL Jack Barnard
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED
(TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006789
SCALE	WT	SHEET 2 OF 3

D 1006789

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006789 D

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
D	THIS SHEET ADDED PER TDRR 05625	1/7/64	

TABLE 1

NASA DASH NO.	CAP (uf)	* MAX WORKING VOLTAGE @85°C VOLTS DC	MAX. ESR +25°C (OHMS)	MAX. DC LEAK. CURRENT (uA)		MAX. IMPEDANCE -55°C OHMS	MAX CAPACITANCE CHANGE (%)	
				+25°C	+85°C		-55°C	+85°C
1006789-001	25	50	7	2.5	12.5	90	-25	+20
1006789-002	47	50	6	4.7	23.5	70	-35	+25
1006789-003	100	10	3	2.0	10.0	60	-45	+30
1006789-004	40	30	3	.1	5	65	-30	+20
1006789-005	30	6	5	0.5	2	100	-50	+15
1006789-006	45	25	3	1	5	90	-35	+20
1006789-007	50	25	3	1	5	75	-35	+20
1006789-008	55	15	3	1	3.5	70	-35	+20
1006789-009	56	8	4	0.5	2	59	-50	+20
1006789-010	70	15	3	1	4.5	63	-35	+20
1006789-011	85	10	3	1	3.5	61	-45	+20
1006789-012	100	10	3	1	4	60	-45	+20
1006789-013	120	8	2	1	4	48	-50	+20
1006789-014	140	6	2	1	3	40	-50	+20

* SURGE VOLTAGE IS 115% OF RATED DC WORKING VOLTAGE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

Ⓓ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C.A. Preston DATE 6JAN64
CHECKED R P Kung 6 Jan 64
APPROVAL 7 Jan 64
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL 1/7/64
MIT APPROVAL 1/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED
(TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006789
SCALE NONE WT SHEET 3 OF 3

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

00497

E 1006789

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

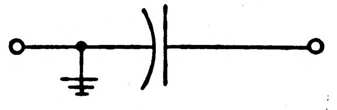
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	
C	REVISED PER TDRR 04909	12/10/63	
D	REVISED PER TDRR 05625	1/7/64	RPK
E	REVISED PER TDRR 06193		WK

REQUIREMENTS:

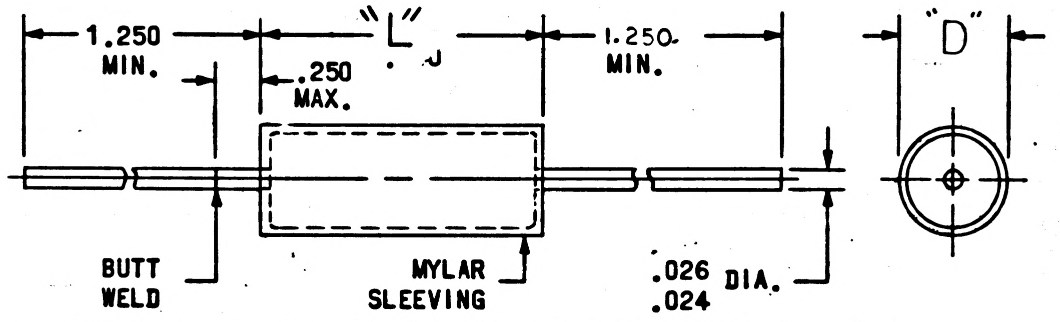
1. GENERAL:
   - A. INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002044 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. UNITS SHALL BE PACKAGED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
     - (1) EACH INDIVIDUAL PART SHALL BE SEPARATED FROM ALL OTHERS AND PACKED SECURELY TO PREVENT CONTACT DURING TRANSIT.
     - (2) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - (3) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE, HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL BE CAPABLE OF MEETING REQUIREMENTS OF MIL-C-3965, CHARACTERISTIC B, VIBRATION GRADE 3.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS PER OUTLINE
     - (2) LEAD DATA: NICKEL ALLOY PER ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER AND SERIAL NUMBER TO SIGNIFY COMPLETION OF BURN-IN. IF SPACE PERMITS, MANUFACTURER'S PART NUMBER, CAPACITANCE VALUE, TOLERANCE AND VOLTAGE MAY ALSO BE MARKED ON PART. EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER PER MIL-STD-129.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CAPACITANCE: PER TABLE I. CAPACITANCE MEASUREMENTS SHALL BE MADE BY MEANS OF A POLARIZED CAPACITANCE BRIDGE. THE MAXIMUM VOLTAGE APPLIED TO THE CAPACITORS DURING MEASUREMENT SHALL BE 2 VOLTS RMS AT 120 CYCLES PER SECOND AT 25°C. MEASRUEMENT ACCURACY OF THE BRIDGE SHALL BE WITHIN ±3%.
     - (2) CAPACITANCE TOLERANCE: ±10% AT 25°C AND 120CPS.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER



GRAPHICAL SYMBOL



CASE SIZE	"L"	"D"
C	.515/.469	.234/.172
F	.703/.656	.327/.265

E	D	E
D	D	D
C	C	—
E	B	—
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

Ⓑ REPLACES REV (A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT NAS 9-497
DRAWN D. Motley DATE 6 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL G. MAYO 8/28/63
APPROVAL Eldon C. Hall 7 Jan 64
NASA APPROVAL
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED (TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006789
SCALE NONE WT SHEET 1 OF 3

1006789 E

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006789 E

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
D	THIS SHEET ADDED PER TDRR 05625	1/7/64	
E	REVISED PER TDRR 06193		

TABLE 1

NASA DASH NO.	CAP (uf)	* MAX WORKING VOLTAGE @85°C VOLTS DC	MAX. ESR +25°C (OHMS)	MAX. DC LEAK. CURRENT (uA)		MAX. IMPEDANCE -55°C	MAX. CAPACITANCE CHANGE (%)		CASE SIZE
				+25°C	+85°C	OHMS	-55°C	+85°C	
1006789-001	25	50	3	1	5	90	-25	+20	F
1006789-002	47	50	3	1.5	9	70	-35	+25	F
1006789-003	100	10	3	1	4	60	-45	+20	F
1006789-004	40	30	3	.1	5	80	-30	+20	F
1006789-005	30	6	5	0.5	2	100	-50	+15	C
1006789-006	45	25	3	1	5	78	-35	+20	F
1006789-007	50	25	3	1	5	70	-35	+20	F
1006789-008	55	15	3	1	3.5	70	-35	+20	F
1006789-009	56	8	4	0.5	2	60	-50	+20	C
1006789-010	70	15	3	1	4.5	63	-35	+20	F
1006789-011	85	10	3	1	3.5	61	-45	+20	F
1006789-012	33	15	4	0.5	2	100	-35	+20	C
1006789-013	120	8	2	1	4	48	-50	+20	F
1006789-014	140	6	2	1	3.5	40	-50	+20	F
1006789-015	68	6	4	0.5	2	59	-50	+20	C
1006789-016	47	10	4	0.5	2	90	-45	+20	C

* SURGE VOLTAGE IS 115% OF RATED DC WORKING VOLTAGE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

Ⓓ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C.A. Preston DATE 6 JAN 64
CHECKED 6 Jan 64
APPROVAL 7 Jan 64
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL 1/7/64
MIT APPROVAL 1/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED
(TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006789
SCALE NONE WT SHEET 3 OF 3

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F 1006789

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	
C	REVISED PER TDRR 04909	12/10/63	
D	REVISED PER TDRR 05625	1/7/64	
E	REVISED PER TDRR 06193		WK
F	REVISED PER TDRR 11987	9/1/64	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002044 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.
   - D. UNITS SHALL BE PACKAGED IN SUCH A MANNER AS TO INSURE THE FOLLOWING:
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     - (2) LEADS SHALL BE SECURED AGAINST WHIPPING OR VIBRATION DURING TRANSIT.
     - (3) BODY MOUNTING SHALL BE SUCH THAT CAPACITORS CAN BE EASILY GRIPPED BY THE BODY AND REMOVED FROM THE PACKAGE, HANDLING OF LEADS IS TO BE HELD TO A MINIMUM.
   - E. UNITS SHALL BE CAPABLE OF MEETING REQUIREMENTS OF MIL-C-3965, CHARACTERISTIC B, VIBRATION GRADE 3.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS PER OUTLINE
     - (2) LEAD DATA: NICKEL ALLOY PER ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (3) MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER AND SERIAL NUMBER TO SIGNIFY COMPLETION OF BURN-IN. IF SPACE PERMITS, MANUFACTURER'S PART NUMBER, CAPACITANCE VALUE, TOLERANCE AND VOLTAGE MAY ALSO BE MARKED ON PART. EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER PER MIL-STD-129.
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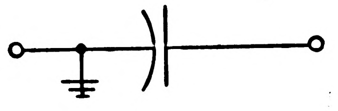
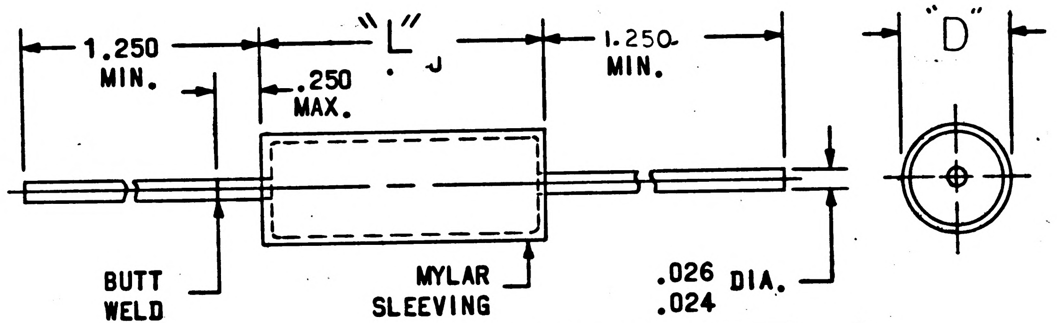
     - (2) CAPACITANCE TOLERANCE: ±10% AT 25°C AND 120CPS.



GRAPHICAL SYMBOL



CASE SIZE	"L"	"D"
C	.515/.469	.234/.172
F	.703/.656	.327/.265

Ⓑ REPLACES REV (A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH NONE

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DWG. NO.
CONTRACT NAS 9-497
DRAWN D. Matley DATE 6 AUG 63
CHECKED WILSON 9 AUG 63
APPROVAL G. MAYO 8/28/63
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL
MIT APPROVAL 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED (TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006789
SCALE NONE
WT
SHEET 1 OF 3

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006789 F

F	1006789

REVISIONS 00497			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A AND UPGRADED TO CLASS A RELEASE PER TDRR 02835	8/28/63	
C	REVISED PER TDRR 04909	12/10/63	
D	REVISED PER TDRR 05625	1/7/64	
F	REVISED PEE TDRR 11987	6/1/64	WH

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ELECTRICAL REQUIREMENTS (CONTINUED):

(3) EQUIVALENT SERIES RESISTANCE: PER TABLE I.

(4) LEAKAGE CURRENT: PER TABLE I MEASUREMENTS SHALL BE MADE AT RATED WORKING VOLTAGE AT THE APPLICABLE TEMPERATURE WITH AN APPLICATION OF A STEADY SOURCE OF POWER, SUCH AS A REGULATED POWER SUPPLY WITH A 1000 OHM RESISTANCE TO LIMIT THE CHARGING CURRENT CONNECTED IN SERIES WITH EACH CAPACITOR UNDER TEST. RATED WORKING VOLTAGE SHALL BE APPLIED TO CAPACITORS FOR 5 MINUTES BEFORE MAKING LEAKAGE CURRENT MEASUREMENTS.

(5) IMPEDANCE AT -55°C: PER TABLE I

(6) CAPACITANCE CHANGE AT -55°C AND +85°C PER TABLE I.

3. DESIGN REQUIREMENTS:

A. DC WORKING VOLTAGE: PER TABLE I

B. OPERATING AMBIENT TEMPERATURE RANGE: -55°C TO +85°C AT RATED VOLTAGE DERATED TO 85% OF RATED VOLTAGE AT +105°C.

C. LEAD STRENGTH: LEADS SHALL WITHSTAND A 3 POUND AXIAL PULL FOR 30 SECONDS THEY SHALL ALSO WITHSTAND THE FOLLOWING TEST TWICE - WITH A 2 POUND LOAD SUSPENDED FROM THE LEAD IN A VERTICAL POSITION. BEND THE NETWORK BODY IN A PLANE 90°, THEN BACK 180° TO THE OPPOSITE EXTREME, AND THEN BACK 90° TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.

4. SPECIAL CONDITIONING BY SUPPLIER:

A. BURN-IN: ALL CAPACITORS SHALL BE BURNED IN FOR 250 HOURS MIN. AT THE RATED DC WORKING VOLTAGE AT A TEMPERATURE OF +85°C.

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:

(1) CAPACITANCE
(2) EQUIVALENT SERIES RESISTANCE
(3) DC LEAKAGE

C. BURN-IN DATA SHALL BE INCLUDED WITH EACH SHIPMENT.

D. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL CAPACITOR WITH THE INITIAL TEST READING, THE FINAL READING, THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS, OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN-IN, SHALL NOT BE ACCEPTABLE.

(1) PARAMETRIC CHANGE LIMITS:
  a. CAPACITANCE: ±10% OF INITIAL VALUE
  b. EQUIVALENT SERIES RESISTANCE: INITIAL REQUIREMENTS

(2) DC LEAKAGE: 125% MAX. OF INITIAL REQUIREMENTS.

MASTER

Ⓑ REPLACES REV (A) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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MATERIAL
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DRAWN G. L. Jacobs DATE 8 AUG 63
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MIT APPROVAL 8/28/63

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HOUSTON, TEXAS

CAPACITOR, FIXED
(TANTALUM, SINTERED ANODE, 85°C, ±10% TOL, INSULATED)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006789
SCALE
WT
SHEET 2 OF 3

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

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1006789 F

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
D	THIS SHEET ADDED PER TDRR 05625	1/7/64	
E	REVISED PER TDRR 06193		WK
F	REVISED PER TDRR 11987	9/1/64	WK

TABLE 1

NASA DASH NO.	CAP (uf)	* MAX WORKING VOLTAGE @85°C VOLTS DC	MAX. ESR +25°C (OHMS)	MAX. DC LEAK. CURRENT (uA)		MAX. IMPEDANCE -55°C	MAX CAPACITANCE CHANGE (%)		CASE SIZE
				+25°C	+85°C	OHMS	-55°C	+85°C	
1006789-001	25	50	3	1	5	90	-25	+20	F
1006789-002	47	50	3	1.5	9	70	-35	+25	F
1006789-003	100	10	3	1	4	60	-45	+20	F
1006789-004	40	30	3	1	5	80	-30	+20	F
1006789-005	30	6	5	0.5	2	100	-50	+15	C
1006789-006	45	25	3	1	5	78	-35	+20	F
1006789-007	50	25	3	1	5	70	-35	+20	F
1006789-008	55	15	3	1	3.5	70	-35	+20	F
1006789-009	56	8	4	0.5	2	60	-50	+20	C
1006789-010	70	15	3	1	4.5	63	-35	+20	F
1006789-011	85	10	3	1	3.5	61	-45	+20	F
1006789-012	33	15	4	0.5	2	100	-55	+20	C
1006789-013	120	8	2	1	4	48	-50	+20	F
1006789-014	140	6	2	1	3.5	40	-50	+20	F
1006789-015	68	6	4	0.5	2	59	-50	+20	C
1006789-016	47	10	4	0.5	2	90	-45	+20	C

* SURGE VOLTAGE IS 115% OF RATED DC WORKING VOLTAGE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

Ⓓ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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TOLERANCES ON
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DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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DRAWN C.A. Preston DATE 6 JAN 64
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APPROVAL 7 Jan 64
APPROVAL Eldon C Hall 7 Jan 64
NASA APPROVAL 1/7/64
MIT APPROVAL 1/7/64

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CAPACITOR, FIXED
(TANTALUM, SINTERED ANODE, 85°C, ±10%
TOL, INSULATED)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006789
SCALE NONE
WT
SHEET 3 OF 3

4 3 2 1

INCHES
0 1 2
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1006789

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS B RELEASE PER TDRR		

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-C-3965, CHARACTERISTIC B, VIBRATION GRADE 3; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C, DERATED 15% AT +105°C.
2. ELECTRICAL REQUIREMENTS:
   - A. RATINGS: PER TABLE.
3. CONSTRUCTION REQUIREMENTS:
   - A. INSULATION SLEEVE: MYLAR.
   - B. LEADS: NICKEL ALLOY PER NASA SPECIFICATION PS 1015400.

     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
   - C. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, VOLTAGE, CAPACITANCE, TOLERANCE, AND POLARITY.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
4. QUALITY ASSURANCE REQUIREMENTS:
   - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN NASA SPECIFICATION ND 1015404, CLASS 2.
5. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

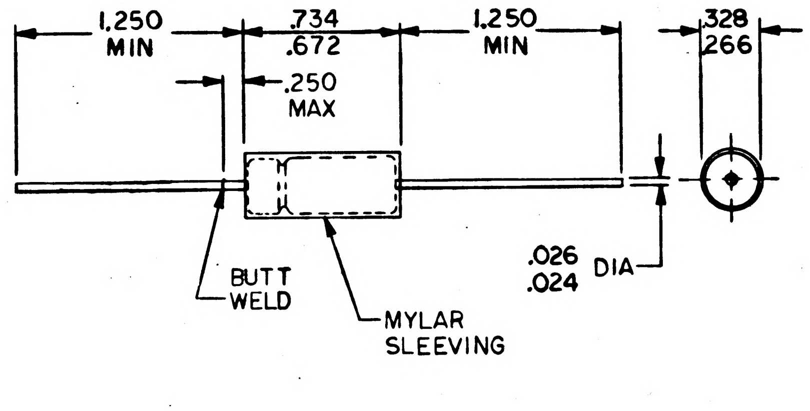
TABLE - ELECTRICAL RATINGS

NASA DASH NO	CAPACITANCE (uF)	CAPACITANCE TOLERANCE (%)	*MAX. WORKING VOLTAGE (VOLTS DC)	MAX. ESR ● +25°C (OHMS)	MAX. DC LEAKAGE CURRENT (uA)		MAX. IMPEDANCE ● -55°C (OHMS)	MAX CAPACITANCE CHANGE (%)	
					+25°C	+85°C		-55°C	+85°C
001	25	10	50	7	2.5	31.25	70	-35	+25
002	47	10	50	6	4.7	58.75	90	-25	+20
003	100	10	10	3	2.0	25.0	60	-45	+20

* SURGE VOLTAGE IS 115% OF RATED DC WORKING VOLTAGE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00477 DATE 3-6-63



ORIGINAL SOURCE OF SUPPLY:

PER QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
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MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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DRAWN R. Kane AP DATE 25 Feb. 63
CHECKED
APPROVAL 3/6/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 6 Mar 63

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CAPCITOR, FIXED, ELECTROLYTIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006789
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1006789

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—			
A	REPLACED BY REV B WITH CHANGES PER TDRR 0/636	6/19/63	L.E.K.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 INCLUDING THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25 DEGREES CENTIGRADE.
     - (1) MAXIMUM PEAK INVERSE VOLTAGE (PIV): 50 VOLTS.
     - (2) MAXIMUM RMS VOLTAGE (V_{AC}): 35 VOLTS (INTO RESISTIVE LOAD)
   - C. MAXIMUM TEMPERATURE RATINGS:
     - (1) OPERATING CASE TEMPERATURE: -65°C TO +100°C.
     - (2) STORAGE TEMPERATURE: -65°C TO +200°C.
   - D. MARKING: UNITS SHALL BE MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, THE NUMBER 943 AND A SYMBOL DENOTING THE CATHODE END OF THE UNIT.
2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR MATERIAL: SILICON.
   - B. CASE MATERIAL: GOLD PLATED MILD STEEL.
   - C. STUD MATERIAL: GOLD PLATED OFHC COPPER.
   - D. INSULATOR DISC: ALUMINA CERAMIC SILVER BRAZED TO BASE OF DO-5 CASE.
   - E. TERMINAL MATERIAL: GOLD PLATED IRON-NICKEL-COBALT ALLOY (KOVAR) PER NASA DOCUMENT 1015402.
3. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS I.
4. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002054.

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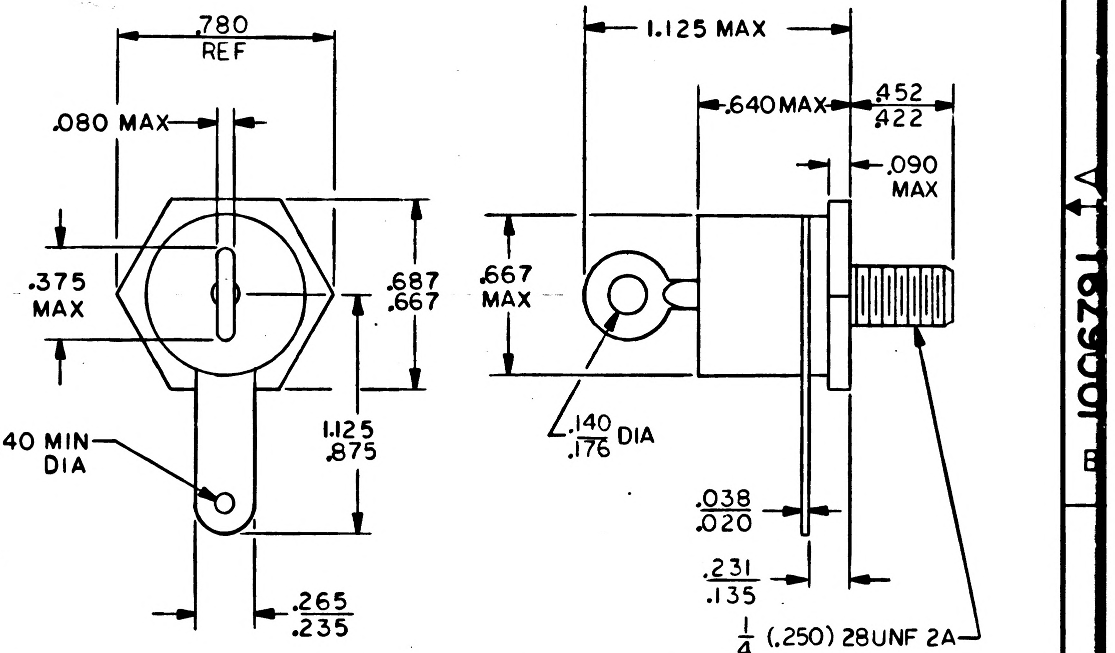
CLASS B RELEASE TDRR NO. 00634 DATE 20 Mar 63



Ⓐ REPLACED BY REV B WITH CHANGES

A	A
—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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FINAL FINISH
NONE

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DRAWN S. Jaffini DATE 2 MAR 63
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APPROVAL Eldon C Hall 19 Mar 63
APPROVAL
NASA APPROVAL 3/20/63
MIT APPROVAL
MIT APPROVAL W Kupfer 20 Mar 63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

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	C	1006791	
SCALE NONE	WT		SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—			
A	REPLACED BY REV B WITH CHANGES PER TDRR 01636	4/19/63	L.F.L.

TABLE I ACCEPTANCE INSPECTION

ELECTRICAL CHARACTERISTICS

TEST	CONDITIONS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT	LTPD %
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION	-	-	-	-	-	-
SUBGROUP 2 FORWARD CURRENT	100°C CASE TEMPERATURE	I_F	-	30	AMP	5
REVERSE CURRENT	PIV = 50V AT 100°C	I_R	-	10	MA	
FORWARD VOLTAGE	I_F = 20 AMP DC	V_F	-	1.5	VDC	
SURGE CURRENT	ONE CYCLE	$i_{(SURGE)}$	-	400	AMP	
RECOVERY TIME	WITH A MAXIMUM OVERSHOOT OF 2.0V WHEN SWITCHED FROM 1 AMP FORWARD TO 30 VDC REVERSE	t_{fr}	-	0.2	USEC	
OVERSHOOT VOLTAGE	AS MEASURED DURING RECOVERY TIME TEST	-	-	3	V	5

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00634 **DATE** 20 Mar 63

Ⓐ REPLACED BY REV B WITH CHANGES

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APPROVAL
APPROVAL Eldon C Hall 19 Mar 63
APPROVAL
NASA APPROVAL 3/20/63
MIT APPROVAL
MIT APPROVAL for 20 Mar 63

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HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006791
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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B 1006791

REVISIONS B Released TDRR 00634 3/20/63

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1636	6/19/63	LEL

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.

   B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.

   C. UNITS SHALL MEET ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054 EXCEPT AS MODIFIED OR AMMENDED BY SECTION 3 OF THIS DRAWING.

   D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS.

   E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. INSPECTION AND ACCEPTANCE:

   A. MECHANICAL REQUIREMENTS:

      (1) TERMINAL: LEAD SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) PER ND 1015402. CERTIFICATION OF COMPLIANCE TO THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPMENT.

   B. MARKING:

      (1) UNIT AND PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER, POLARITY, AND LOT CODE IDENTIFICATION. THE UNIT SHALL BE MARKED WITH THE MANUFACTURER'S NAME.

   C. ELECTRICAL CHARACTERISTICS: PER TABLE I.

      (1) REVERSE CURRENT (I_R)

      (2) FORWARD VOLTAGE (V_F)

      (3) SURGE CURRENT (I_{SURGE})

      (4) RECOVERY TIME (T_{RR})

      (5) MAXIMUM OVERSHOOT (I_{OS})

      (6) REVERSE BREAKDOWN (PIV)

3. DESIGN REQUIREMENTS:

   A. MAXIMUM RATINGS AT 25°C.

      (1) MAXIMUM RMS VOLTAGE (V_{AC}): 70 VOLTS (INTO RESISTIVE LOAD).

   B. TEMPERATURE RATINGS:

      (1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.

      (2) STORAGE TEMPERATURE: -65°C TO +175°C.

      (3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT

   C. CONSTRUCTION:

      (1) SEMICONDUCTOR MATERIAL: SILICON.

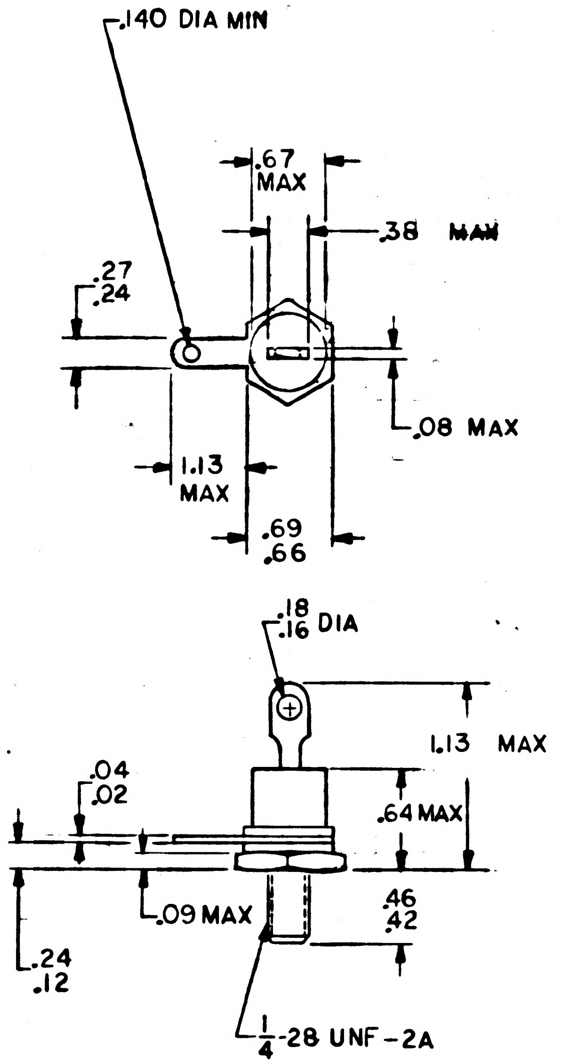
      (2) CASE MATERIAL: GOLD PLATED MILLED STEEL.

      (3) INSULATOR DISC: ALUMINA CERAMIC SILVER BRAZED TO BASE OF DO-5 CASE.

      (4) STUD MATERIAL: GOLD PLATED OFHC COPPER.

      (5) STUD TORQUE: SHALL BE CAPABLE OF 15 INCH-POUNDS MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



Ⓑ REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
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APPROVAL Eldon C Hall 19 June 63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE, POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006791
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
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REVISIONS B Released TDRR 00634 3/20/63

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1636	6/19/63	L.E.L

TABLE I ACCEPTANCE INSPECTION

	ELECTRICAL CHARACTERISTICS					
TEST	CONDITIONS	SYMBOL	LIMITS		UNIT	LTPD %
			MIN	MAX		
REVERSE BREAKDOWN	I_R = 10 ma; 25°C	PIV	100	-	VOLTS	5
REVERSE CURRENT	V_R = 30 V; 100°C	I_R	-	10	ma	
FORWARD VOLTAGE	I_F = 30 AMP DC AT 25°C	V_F	-	1.4	VDC	
FORWARD SURGE CURRENT	1/2 CYCLE, 60 CPS, AT TEASE = 100°C	I_{SURGE}	-	300	AMP	
RECOVERY TIME *	I_F = 1 AMP TO 30 VDC REVERSE PER TEST CIRCUIT	T_{RR}	-	200	NANO-SEC	
PEAK OVERSHOOT	AS MEASURED DURING RECOVERY TIME TEST	I_{OS}	-	3	AMPS	

* SEE FIG. 1 AND 2.

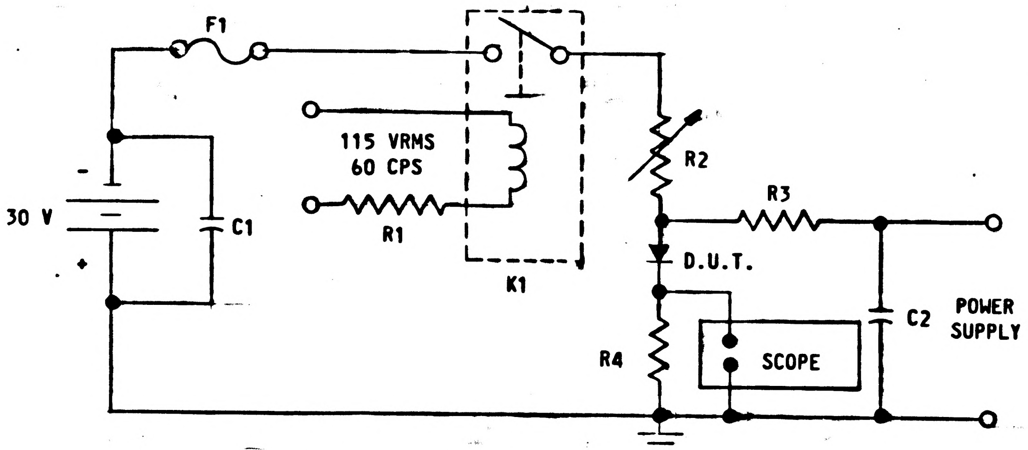

FIG. 2 RECOVERY TIME TEST CIRCUIT

C1, C2 - 1 UF ± 10% 300 VDC OIL FILLED
R1 - 10K 2W 5%
R2 - 3 OHM 25W POTENTIOMETER
R3 - 30 OHM 30 WATTS 10% CARBON FILM
R4 - 1 OHM 10W 1% NON-INDUCTIVE
K1 - HGP-1002 CLARE
F1 - SLO-BLO- 1 AMP
SCOPE - TEKTRONIX 541 OR 545 WITH 53/54K PREAMPLIFIER, 0-6000 1:10 ISOLATION PROBE OR EQUIVALENT.
POWER SUPPLY - 35 VOLTS AT 1.0 AMPERE MINIMUM, RIPPLE 3 MILLIVOLTS RMS OR LESS, OUTPUT IMPEDANCE 1/2 OHM MAXIMUM, DC TO 2000 CPS.

NOTE: WIRE AND ADJUST R2 SO RESISTANCE FROM RELAY TO ANODE OF D.U.T. IS 1.4 ± .05 OHMS INDUCTANCE 38 ± 1 MICROHENRIES.

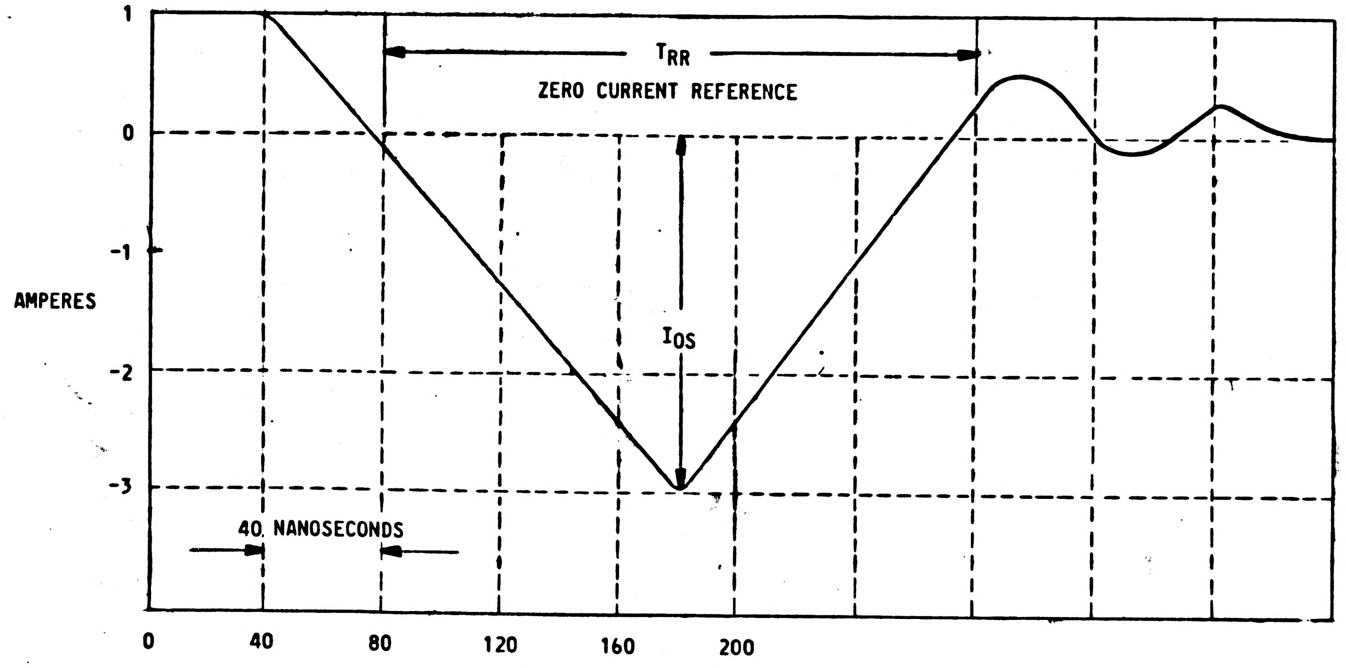

FIG. 1 TYPICAL RECOVERY PATTERN

Ⓑ REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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NASA APPROVAL 6/19/63
MIT APPROVAL L. E. 6/19/63

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SEMICONDUCTOR DEVICE, DIODE, POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006791
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
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REVISIONS B Released TDRR 00634 8/20/63

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1636	6/19/63	LEL
C	REVISED PER TDRR 02820	8/28/63	

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REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054 EXCEPT AS MODIFIED OR AMMENDED BY SECTION 3 OF THIS DRAWING.
   - D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS.
   - E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINAL: LEAD SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) PER ND 1015402. CERTIFICATION OF COMPLIANCE TO THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPMENT.
   - B. MARKING:
     - (1) UNIT AND PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER, POLARITY, AND LOT CODE IDENTIFICATION. THE UNIT SHALL BE MARKED WITH THE MANUFACTURER'S NAME.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) REVERSE CURRENT (I_R)
     - (2) FORWARD VOLTAGE (V_F)
     - (3) SURGE CURRENT (I_{SURGE})
     - (4) RECOVERY TIME (T_{RR})
     - (5) MAXIMUM OVERSHOOT (I_{OS})
     - (6) REVERSE BREAKDOWN (PIV)
3. DESIGN REQUIREMENTS:
   - A. MAXIMUM RATINGS AT 25°C.
     - (1) MAXIMUM RMS VOLTAGE (V_{AC}): 70 VOLTS (INTO RESISTIVE LOAD).
   - B. TEMPERATURE RATINGS:
     - (1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.
     - (2) STORAGE TEMPERATURE: -65°C TO +175°C.
     - (3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT
   - C. CONSTRUCTION:
     - (1) SEMICONDUCTOR MATERIAL: SILICON.
     - (2) CASE MATERIAL: GOLD PLATED MILLED STEEL.
     - (3) INSULATOR DISC: ALUMINA CERAMIC SILVER BRAZED TO BASE OF DO-5 CASE.
     - (4) STUD MATERIAL: GOLD PLATED OFHC COPPER.
     - (5) STUD TORQUE: SHALL BE CAPABLE OF 30 INCH-POUNDS MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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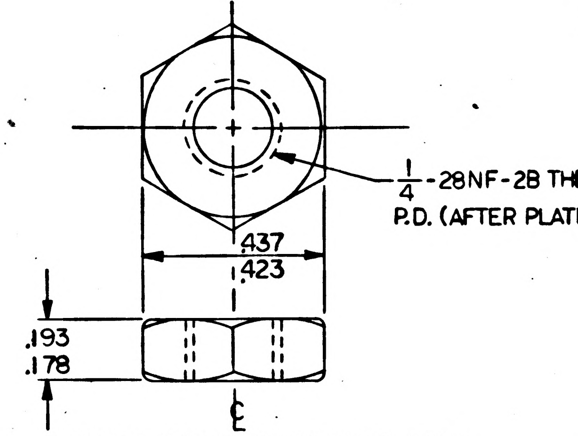
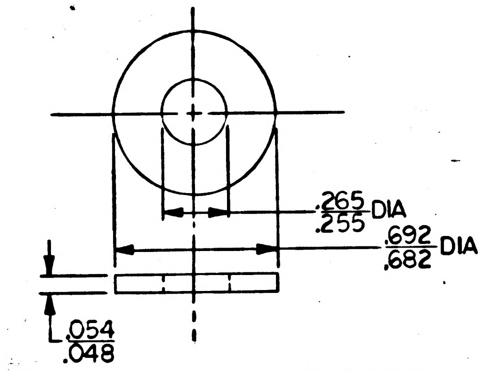


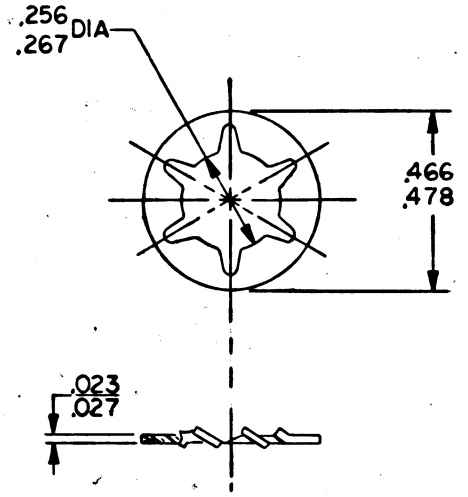
FINISH: COMMERCIAL NICKEL PLATING

NUT-HEXAGON



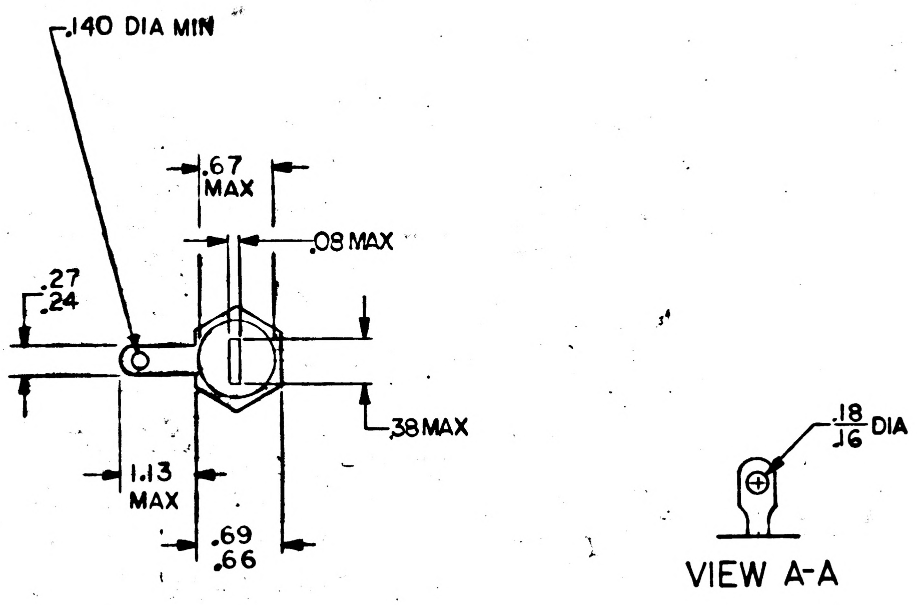
FINISH: COMMERCIAL NICKEL PLATING

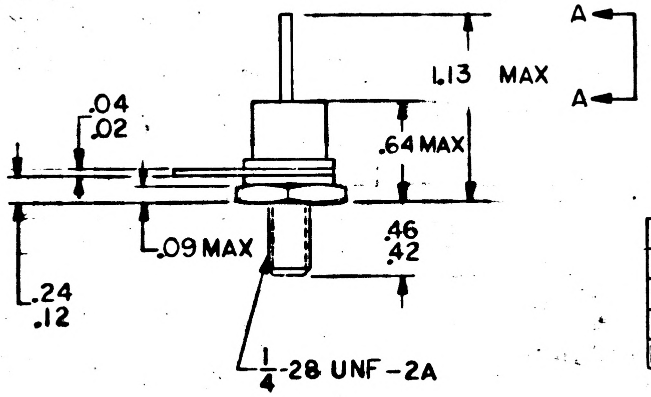
WASHER FLAT



FINISH: COMMERCIAL NICKEL PLATING

LOCK WASHER





C	B
B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓑ REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

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APPROVAL Eldon C. Hall 18 June 63
NASA APPROVAL 6/1/63
MIT APPROVAL 6/18/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE,
POWER-INSULATED BASE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006791
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D	1006791

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REVISIONS B Released TDRR 00634 3/20/63

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1636	6/19/63	LEL
C	REVISED PER TDRR 02820	8/28/63	
D	REVISED PER TDRR 04910	12/10/63	

REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.
   - C. THE PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002051.
   - D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS.
   - E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINAL: LEAD SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) PER ND 1015402. CERTIFICATION OF COMPLIANCE TO THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPMENT.
   - B. MARKING:
     - (1) UNIT AND PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER, POLARITY, AND LOT CODE IDENTIFICATION. THE UNIT SHALL BE MARKED WITH THE MANUFACTURER'S NAME.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) REVERSE CURRENT (I_R)
     - (2) FORWARD VOLTAGE (V_F)
     - (3) RECOVERY TIME (T_{RR})
     - (4) MAXIMUM OVERSHOOT (I_{OS})
     - (5) REVERSE BREAKDOWN (PIV)
3. DESIGN REQUIREMENTS:
   - A. MAXIMUM RATINGS AT 25°C.
     - (1) MAXIMUM RMS VOLTAGE (V_{AC}): 70 VOLTS (INTO RESISTIVE LOAD).
   - B. TEMPERATURE RATINGS:
     - (1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.
     - (2) STORAGE TEMPERATURE: -65°C TO +175°C.
     - (3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT
   - C. CONSTRUCTION:
     - (1) SEMICONDUCTOR MATERIAL: SILICON.
     - (2) CASE MATERIAL: GOLD PLATED MILLED STEEL.
     - (3) INSULATOR DISC: ALUMINA CERAMIC SILVER BRAZED TO BASE OF DO-5 CASE.
     - (4) STUD MATERIAL: GOLD PLATED OFHC COPPER.
     - (5) STUD TORQUE: SHALL BE CAPABLE OF 30 INCH-POUNDS MAXIMUM.
   - D. MAXIMUM FORWARD SURGE CURRENT: 300 AMPS, 1/2 CYCLE, 60 CPS, OPERATING AT CASE TEMPERATURE (T_C) 100°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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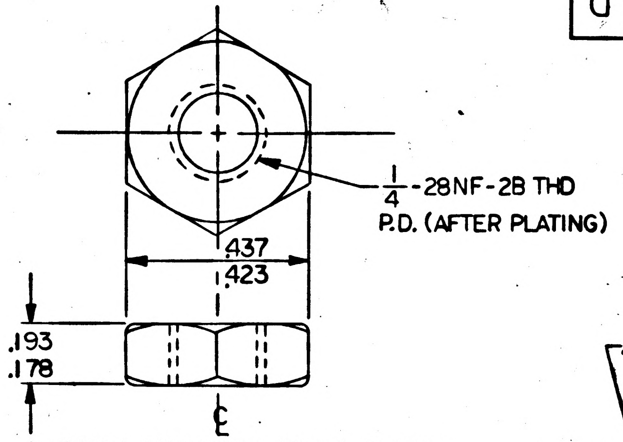
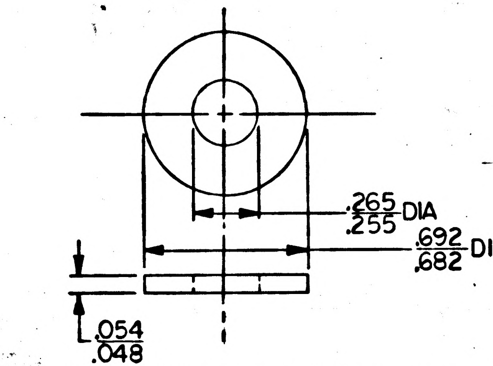


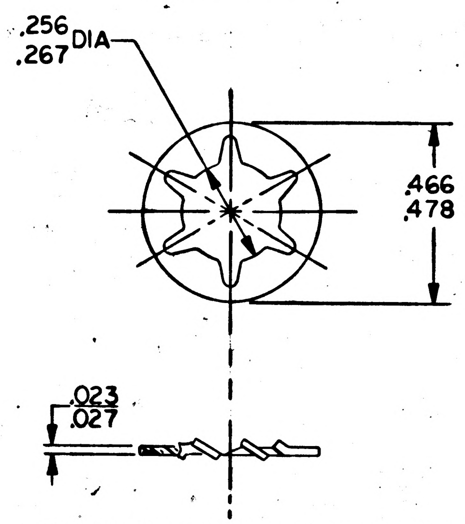
FINISH: COMMERCIAL NICKEL PLATING

NUT-HEXAGON



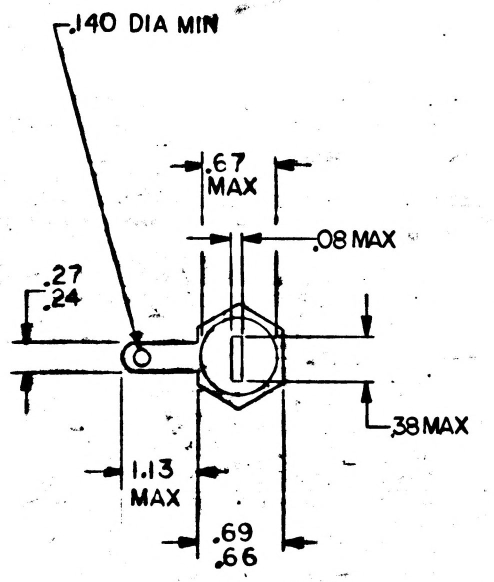
FINISH: COMMERCIAL NICKEL PLATING

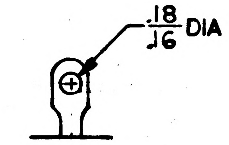
WASHER FLAT



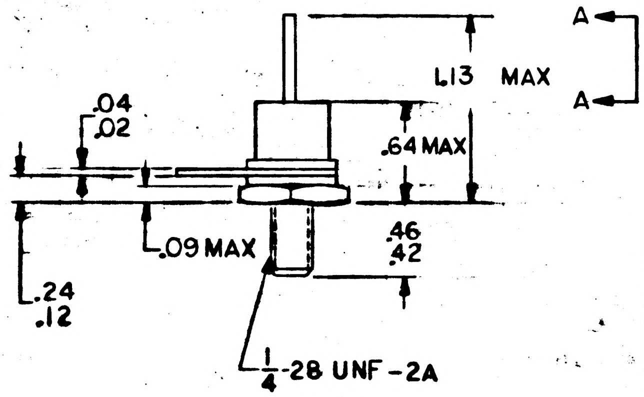
FINISH: COMMERCIAL NICKEL PLATING

LOCK WASHER





VIEW A-A



D	D
C	B
B	B
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

Ⓑ REPLACES REV A WITH CHANGES

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006791
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INCHES
0 1 2
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REVISIONS B REVISED TDRR 00634 3/20/63

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1634	4/19/63	L.E.L.
D	REVISED PER TDRR 04910	12/10/63	Du

TABLE I ACCEPTANCE INSPECTION

	ELECTRICAL CHARACTERISTICS					
TEST	CONDITIONS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT	LTPD %
REVERSE BREAKDOWN	I_R = 10 ma; 25°C	PIV	100	-	VOLTS	5
REVERSE CURRENT	V_R = 30 V; 100°C	I_R	-	10	ma	
FORWARD VOLTAGE	I_F = 30 AMP DC AT 25°C	V_F	-	1.4	VDC	
RECOVERY TIME *	I_F = 1 AMP TO 30 VDC REVERSE PER TEST CIRCUIT	T_{RR}	-	200	NANO-SEC	
PEAK OVERSHOOT	AS MEASURED DURING RECOVERY TIME TEST	I_{OS}	-	3	AMPS	

* SEE FIG. 1 AND 2.

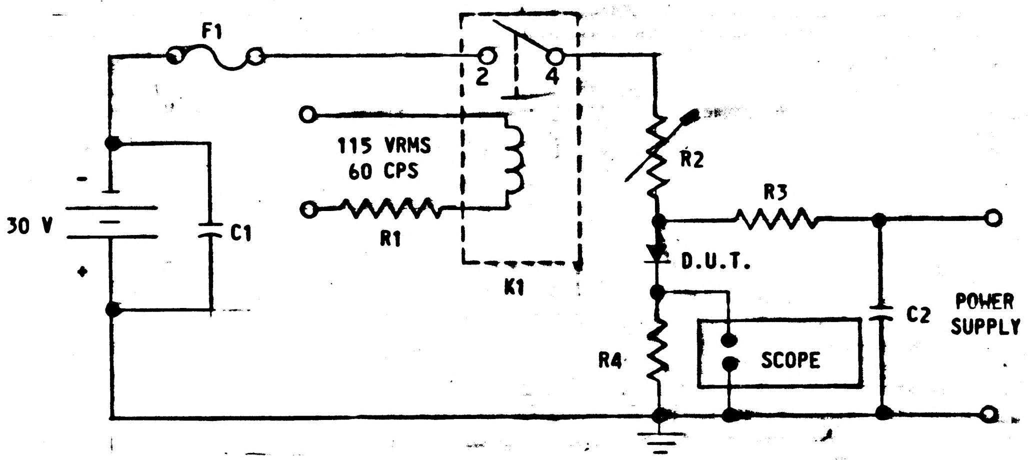

FIG. 2 RECOVERY TIME TEST CIRCUIT

BATTERIES - 5 BURGESS 4F4H(6 VOLT) SERIES
C1, C2 - 1 UF ± 10% 300 VDC OIL FILLED
R1 - 10K 2W 5%
R2 - 3 OHM 25W POTENTIOMETER
R3 - 30 OHM 30 WATTS 10% CARBON FILM NON-INDUCTIVE
R4 - 1 OHM 10W 1% NON-INDUCTIVE
K1 - HGP-1002 CLARE
F1 - SLO-BLO- 1 AMP
SCOPE - TEKTRONIX 541 OR 545 WITH 53/54K PREAMPLIFIER, P-6000 1:10 ISOLATION PROBE OR EQUIVALENT.
POWER SUPPLY - 35 VOLTS AT 1.0 AMPERE MINIMUM, RIPPLE 3 MILLIVOLTS RMS OR LESS, OUTPUT IMPEDANCE 1/2 OHM MAXIMUM, DC TO 2000 CPS.

NOTE: WIRE AND ADJUST R2 SO RESISTANCE FROM RELAY TO ANODE OF D.U.T. IS 1.4 ± .05 OHMS, INDUCTANCE LESS THAN 2 MICROHENRIES.

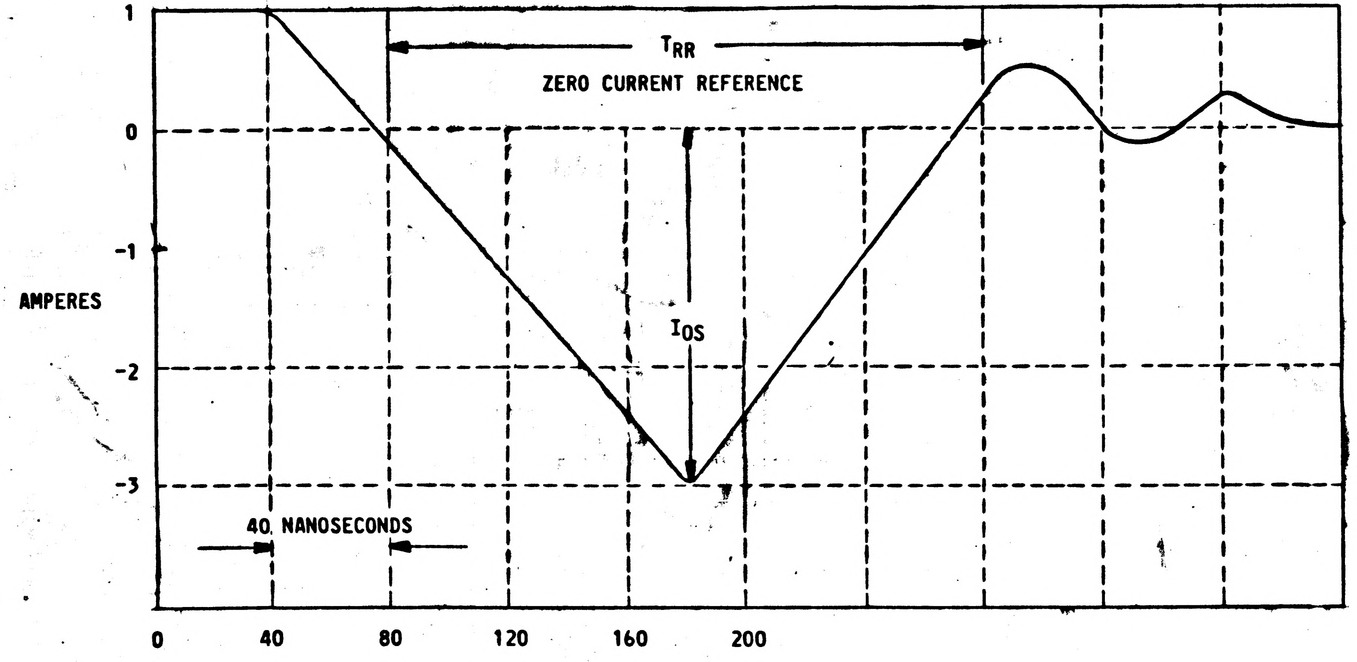

FIG. 1 TYPICAL RECOVERY PATTERN

Ⓑ REPLACES REV A WITH CHANGES

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DRAWN H. Pennie DATE 3 JUNE 63
CHECKED J. Ruggiero
APPROVAL 6/19/63
APPROVAL Eldon C Hall 18 JUNE 63
NASA APPROVAL 6/19/63
MIT APPROVAL L. E. Larson 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE,
POWER-INSULATED BASE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006791
SCALE NONE WT SHEET 2 OF 2

INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
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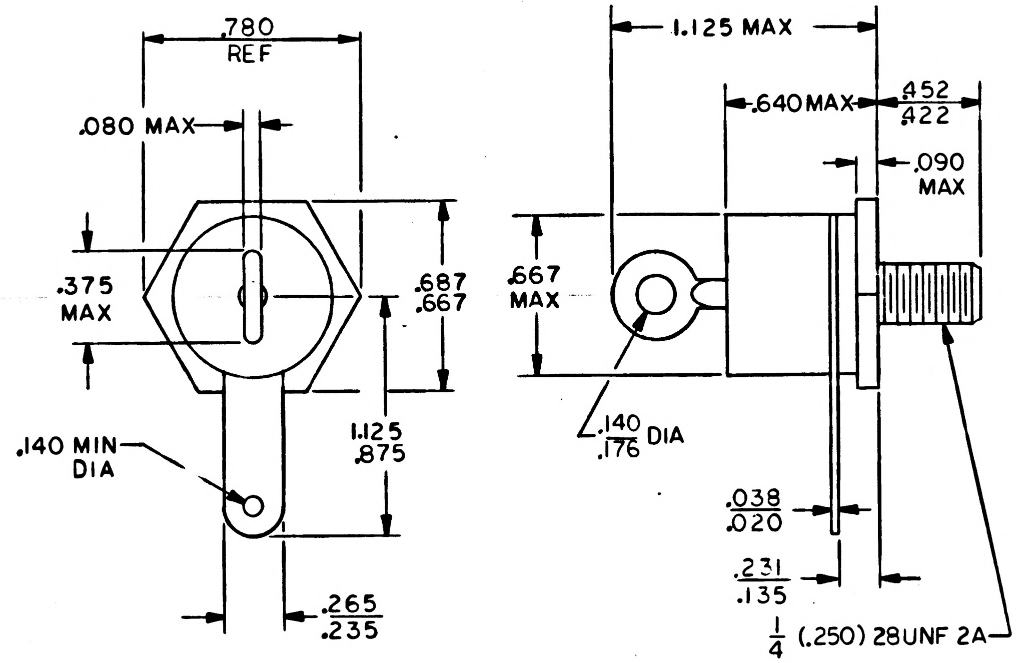
NOTES:

1. GENERAL REQUIREMENTS:
    - A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 INCLUDING THE REQUIREMENTS SPECIFIED HEREIN.
    - B. ABSOLUTE MAXIMUM RATINGS AT 25 DEGREES CENTIGRADE.
        - (1) MAXIMUM PEAK INVERSE VOLTAGE (PIV): 50 VOLTS.
        - (2) MAXIMUM RMS VOLTAGE (V_{AC}): 35 VOLTS (INTO RESISTIVE LOAD)
    - C. MAXIMUM TEMPERATURE RATINGS:
        - (1) OPERATING CASE TEMPERATURE: -65°C TO +100°C.
        - (2) STORAGE TEMPERATURE: -65°C TO +200°C.
    - D. MARKING: UNITS SHALL BE MARKED PER STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, THE NUMBER 943 AND A SYMBOL DENOTING THE CATHODE END OF THE UNIT.
2. CONSTRUCTION REQUIREMENTS:
    - A. SEMICONDUCTOR MATERIAL: SILICON.
    - B. CASE MATERIAL: GOLD PLATED MILD STEEL.
    - C. STUD MATERIAL: GOLD PLATED OFHC COPPER.
    - D. INSULATOR DISC: ALUMINA CERAMIC SILVER BRAZED TO BASE OF DO-5 CASE.
    - E. TERMINAL MATERIAL: GOLD PLATED IRON-NICKEL-COBALT ALLOY (KOVAR) PER NASA DOCUMENT 1015402.
3. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS I.
4. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002054.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 00634 DATE 20 Mar 63



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SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
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DRAWN S. Jaffini DATE 2 MAR 63
CHECKED [illegible] 2 Mar 63
APPROVAL
APPROVAL Eldon C Hall 19 Mar 63
APPROVAL
NASA APPROVAL [illegible] 3/20/63
MIT APPROVAL
MIT APPROVAL W Kupfer 20 Mar 63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006791
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
—			

TABLE I ACCEPTANCE INSPECTION

ELECTRICAL CHARACTERISTICS

TEST	CONDITIONS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT	LTPD %
SUBGROUP 1						
VISUAL AND MECHANICAL EXAMINATION	–	–	–	–	–	–
SUBGROUP 2						
FORWARD CURRENT	100°C CASE TEMPERATURE	I_F	–	30	AMP	5
REVERSE CURRENT	PIV = 50V AT 100°C	I_R	–	10	MA	↕
FORWARD VOLTAGE	I_F = 20 AMP DC	V_F	–	1.5	VDC	↕
SURGE CURRENT	ONE CYCLE	$i_{(SURGE)}$	–	400	AMP	↕
RECOVERY TIME	WITH A MAXIMUM OVERSHOOT OF 2.0V WHEN SWITCHED FROM 1 AMP FORWARD TO 30 VDC REVERSE	t_{fr}	–	0.2	USEC	↕
OVERSHOOT VOLTAGE	AS MEASURED DURING RECOVERY TIME TEST	–	–	3	V	5

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00634 DATE 20 Mar 63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DRAWN R. Kane DATE 6 March 63
CHECKED AP. S. Pachotzky 6 Mar 63
APPROVAL
APPROVAL Eldon C Hall 19 Mar 63
APPROVAL
NASA APPROVAL W Michael 3/20/63
MIT APPROVAL
MIT APPROVAL W Kupfer for 20 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006791
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006791

1006793 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	ORIGINATED		
A	REPLACED BY REV B WITH CHANGES PER TDRR 01635	6/19/63	ZEY.

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NOTES:

1. GENERAL REQUIREMENTS:

   A. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-C-11272, STYLE CY20, OPERATING TEMPERATURE C, TOLERANCE G; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

2. CONSTRUCTION REQUIREMENTS:

   A. LEADS: IRON-NICKEL ALLOY, COPPER CLAD, GOLD PLATED PER NASA DOCUMENT PS 1015401.

      A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

      EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

   B. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL AND TYPE DESIGNATION.

      MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER.

3. QUALITY ASSURANCE REQUIREMENTS:

   A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN NASA SPECIFICATION ND 1015404, CLASS 2

4. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

NASA DASH NO.	CAPACITANCE (pf)	WORKING VOLTAGE DC
001	560	500
002	620	
003	680	
004	750	
005	820	
006	910	
007	1000	
008	1100	
009	1200	
010	1300	
011	1500	
012	1600	
013	1800	
014	2000	
015	2200	
016	2400	
017	2700	
018	3000	
019	3300	500
020	3600	300
021	3900	
022	4300	
023	4700	
024	5100	300

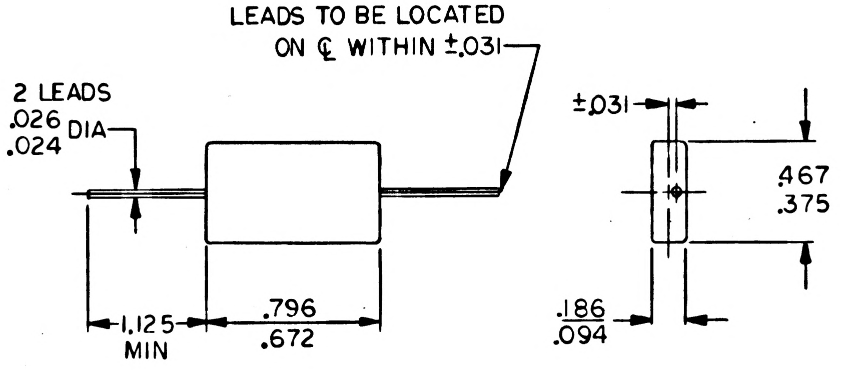
ORIGINAL SOURCE OF SUPPLY:

PER QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

MASTER

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00497 DATE 3-6-63



Ⓐ REPLACED BY REV(B)WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

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DRAWN R. Kane AP DATE 26 Feb. 63
CHECKED B.F. Bowler 2/23/63
APPROVAL [illegible] 3/6/63
APPROVAL
NASA APPROVAL Bernard
MIT APPROVAL [illegible] 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, GLASS DIELECTRIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006793 A

1006793 B

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	ZEK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.
   - E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130, WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, CAPACITANCE VALUE, CAPACITANCE TOLERANCE AND WORKING VOLTAGE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL SHALL BE GOLD PLATED, COPPER CLAD, IRON-NICKEL ALLOY PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE I.
   - C. DIMENSIONS: PER TABLE II & SKETCH.
3. SPECIAL CONDITIONING (BY SUPPLIER):
   - A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

TABLE I

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-1	560	500	A
-2	620		
-3	680		
-4	750		
-5	820		
-6	910		
-7	1000		
-8	1100		
-9	1200		
-10	1300		
-11	1500		
-12	1600		
-13	1800		
-14	2000		
-15	2200		
-16	2400		
-17	2700		
-18	3000		
-19	3300	500	
-20	3600	300	
-21	3900		
-22	4300		
-23	4700		
-24	5100	300	A
-25	3600	500	B
-26	3900		
-27	4300		
-28	4700		
-29	5100		
-30	5600		
-31	6200	500	
-32	6800	300	
-33	7500		
-34	8200		
-35	9100		
-36	10,000	300	B

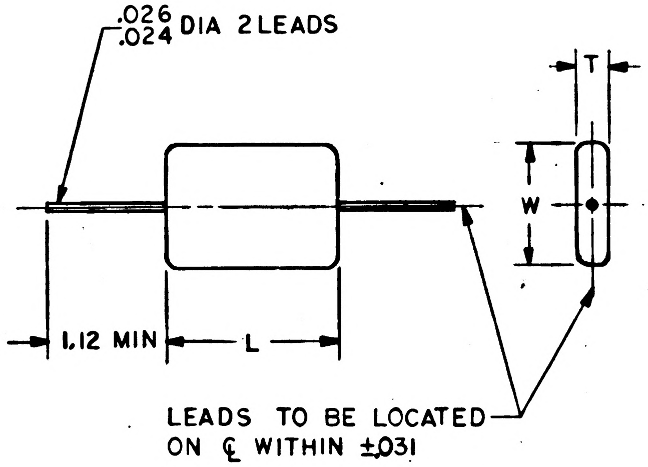

TABLE II

SIZE	L	W	T
A	.796 .672	.467 .375	.186 .094
B	.828 .703	.828 .672	.186 .094

Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DRAWN H. Pinnick /JPD DATE 12 JUNE 63
CHECKED H. Maynard 13 JUNE '63
APPROVAL Ed Duncan 6/19/63
APPROVAL Eldon C Hall 13 JUNE 63
NASA APPROVAL 6/19/63
MIT APPROVAL L. E. Larson Jr. 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

C	1006793

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	
C	CHANGES PER TDRR 02616	8/14/63	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.

E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130, WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, CAPACITANCE VALUE, CAPACITANCE TOLERANCE AND WORKING VOLTAGE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) LEAD MATERIAL SHALL BE GOLD PLATED, COPPER CLAD, IRON-NICKEL ALLOY PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

C. DIMENSIONS: PER TABLE II & SKETCH.

3. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

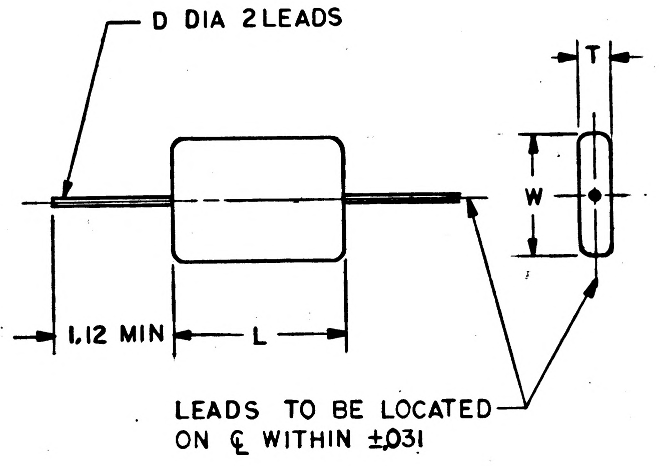

TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
D	.516 .422	.297 .234	.156 .063	.021 .019

C	C
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓑ REPLACES REV A WITH CHANGES

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LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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DRAWN H. Lunnie/JAD DATE 12 JUNE 63
CHECKED 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 18 JUNE 63
NASA APPROVAL 6/19/63
MIT APPROVAL 6/19/63

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CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006793
SCALE NONE WT SHEET 1 OF 2

INCHES
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4 3 2 1

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1006793 C

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	THIS SHEET ADDED PER TDRR 02616	8/14/63	WK

TABLE II

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-1	560	500	A
-2	620		
-3	680		
-4	750		
-5	820		
-6	910		
-7	1000		
-8	1100		
-9	1200		
-10			
-11	1500		
-12	1600		
-13	1800		
-14	2000		
-15	2200		
-16	2400		
-17	2700		
-18	3000		
-19	3300	500	
-20	3600	300	
-21	3900		
-22	4300		
-23	4700		
-24	5100	300	A
-25	3600	500	B
-26	3900		
-27	4300		
-28	4700		
-29	5100		
-30	5600		
-31	6200	500	
-32	6800	300	
-33	7500		
-34	8200		
-35	9100		
-36	10,000	300	B
-37	10*	500	C
-38	11*		
-39	12*		
-40	13		
-41	15		
-42	16		
-43	18		
-44	20		
-45	22	500	C

*THESE UNITS HAVE TOLERANCE OF ±0.25 uf

TABLE II (CONT)

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-46	24	500	C
-47	27		
-48	30		
-49	33		
-50	36		
-51	39		
-52	43		
-53	47		
-54	51		
-55	56		
-56	62		
-57	68		
-58	75		
-59	82		
-60	91		
-61	100		
-62	110		
-63	120		
-64	130		
-65	150	500	
-66	160	300	
-67	180		
-68	200		
-69	220		
-70	240	300	C
-71	220	500	D
-72	240		
-73	270		
-74	300		
-75	330		
-76	360		
-77	390		
-78	430		
-79	470		
-80	510	500	
-81	560	300	
-82	620		
-83	680		
-84.	750		
-85	820		
-86	910		
-87	1000		
-88	1100		
-89	1200	300	D

Ⓒ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
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DWG. NO. CONTRACT

DRAWN R. Kane DATE 8-14-63
CHECKED A. Marto 8-14-63
APPROVAL AG for G. MAYO 8/14/63
APPROVAL Ellen C Hall 14 Aug 63
NASA APPROVAL WJ Rhine 8-14-63
MIT APPROVAL WH for 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006793
SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
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4 3 2 1

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D	1006793

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	ZFX
C	CHANGES PER TDRR 02616	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.

E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130, WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, CAPACITANCE VALUE, CAPACITANCE TOLERANCE AND WORKING VOLTAGE PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:

(1) COVE COMPOSITION:
Ni - 45.25% TO 46.75%
C - 0.10% MAX.
Mn - 0.35% - 1.25%
Si - 0.30% MAX.
S - 0.020% MAX.
P - 0.020% MAX.
RESIDUALS - 1.50 MAX.
Fe - BALANCE

(2) CLADDING:
99.92% COPPER, OXYGEN FREE
18.25% BY WEIGHT

(3) PLATING:
ELECTROPLATED 24 KARAT GOLD,
50 MICROINCHES MINIMUM

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

C. DIMENSIONS: PER TABLE I & SKETCH

3. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

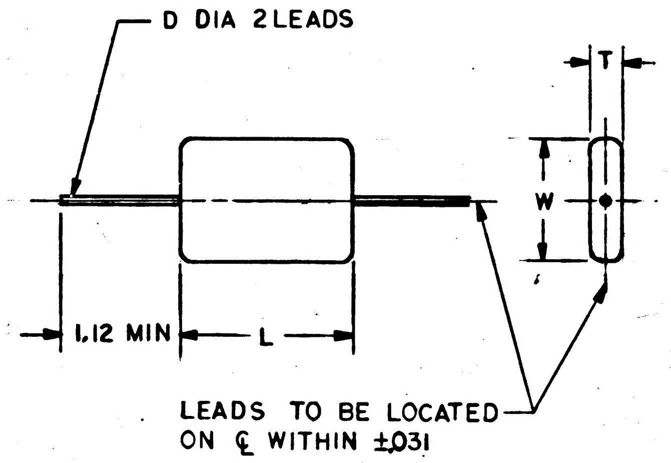

TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
D	.516 .422	.297 .234	.156 .063	.021 .019

D	C
C	C
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN /JPD DATE 12 JUNE 63
CHECKED 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 13 June 63
NASA APPROVAL 6/17/63
MIT APPROVAL R. E. 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006793 | E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	EEK
C	CHANGES PER TDRR 02616	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	
E	REVISED PER TDRR 04490		

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.

E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130, WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, CAPACITANCE VALUE, CAPACITANCE TOLERANCE . PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:

(1) COVE COMPOSITION:
Ni - 45.25% TO 46.75%
C - 0.10% MAX.
Mn - 0.35% - 1.25%
Si - 0.30% MAX.
S - 0.020% MAX.
P - 0.020% MAX.
RESIDUALS - 1.50 MAX.
Fe - BALANCE

(2) CLADDING:
99.92% COPPER, OXYGEN FREE
18.25% BY WEIGHT

(3) PLATING:
ELECTROPLATED 24 KARAT GOLD,
50 MICROINCHES MINIMUM

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

C. DIMENSIONS: PER TABLE I & SKETCH

3. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

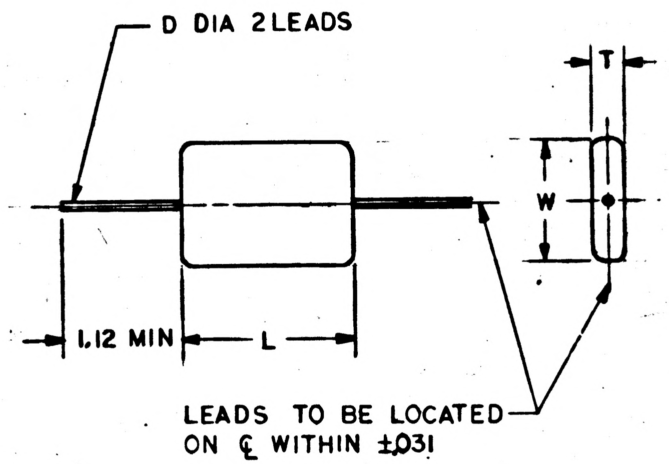

TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
D	.516 .422	.297 .234	.156 .063	.021 .019

E	C
D	C
C	C
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN H. Cunniss / JAD DATE 12 JUNE 63
CHECKED L. Maynard 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 13 June 63
NASA APPROVAL 6/17/63
MIT APPROVAL L. E. Larson 6/18/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006793
SCALE NONE	WT	SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006793 F

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	EEK
C	CHANGES PER TDRR 02616	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	JM
E	REVISED PER TDRR 04490	[illegible]	WK
F	REVISED PER TDRR 04538	11-13-63	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.

E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019. WITH THE NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER AND THE MANUFACTURER'S NAME OR SYMBOL. CAPACITANCE VALUE, TOLERANCE AND THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:

(1) CORE, COMPOSITION:
Ni - 45.25% TO 46.75%
C - 0.10% MAX.
Mn - 0.35% - 1.25%
Si - 0.30% MAX.
S - 0.020% MAX.
P - 0.020% MAX.
RESIDUALS - 1.50 MAX.
Fe - BALANCE

(2) CLADDING:
99.92% COPPER, OXYGEN FREE
18.25% BY WEIGHT

(3) PLATING:
ELECTROPLATED 24 KARAT GOLD,
50 MICROINCHES MINIMUM

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

C. DIMENSIONS: PER TABLE I & SKETCH

3. SPECIAL CONDITIONING (BY SUPPLIER):

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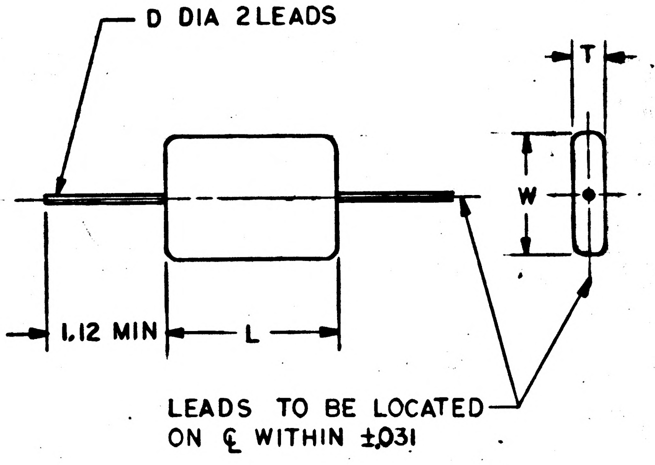

TABLE I

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F	C
E	C
D	C
C	C
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN K. Runnie / JPD DATE 12 JUNE 63
CHECKED Maynard 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 18 JUNE 63
NASA APPROVAL 6/17/63
MIT APPROVAL L. E. Larson Jr 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006793 G

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	ERK
C	CHANGES PER TDRR 02616	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	[illegible]
E	REVISED PER TDRR [illegible]	[illegible]	[illegible]
F	REVISED PER TDRR 04538	11-13-63	WK
G	REVISED PER TDRR 11502	8/18/64	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE-C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.
   - E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019. WITH THE NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER AND THE MANUFACTURER'S NAME OR SYMBOL. CAPACITANCE VALUE, TOLERANCE AND THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:
     - (1) CORE COMPOSITION:
       - Ni - 45.25% TO 46.75%
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       - Si - 0.30% MAX.
       - S - 0.020% MAX.
       - P - 0.020% MAX.
       - RESIDUALS - 1.50 MAX.
       - Fe - BALANCE
     - (2) CLADDING:
       - 99.92% COPPER, OXYGEN FREE
       - 18-25% BY WEIGHT
     - (3) PLATING:
       - ELECTROPLATED 24 KARAT GOLD, 50 MICROINCHES MINIMUM
   - B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.
   - C. DIMENSIONS: PER TABLE I & SKETCH
3. SPECIAL CONDITIONING (BY SUPPLIER):
   - A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
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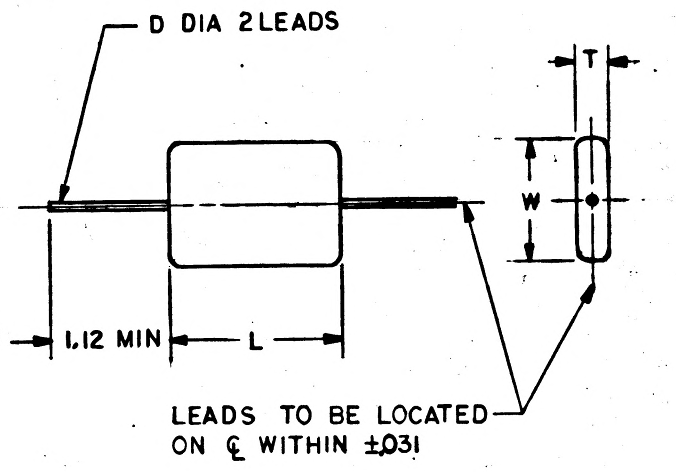

Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN H. Reunie /JAD DATE 12 JUNE 63
CHECKED H. Maynard 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 13 June 63

NASA APPROVAL 6/19/63

MIT APPROVAL R. E. Lane 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	THIS SHEET ADDED PER TDRR 02616	8/14/63	WK.
G	REVISED PER TDRR 11502	8/18/64	WK

TABLE II

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-1	560	500	A
-2	620	↑	↑
-3	680		
-4	750		
-5	820		
-6	910		
-7	1000		
-8	1100		
-9	1200		
-10			
-11	1500		
-12	1600		
-13	1800		
-14	2000		
-15	2200		
-16	2400		
-17	2700		
-18	3000	↓	
-19	3300	500	
-20	3600	300	
-21	3900	↑	
-22	4300		
-23	4700	↓	↓
-24	5100	300	A
-25	3600	500	B
-26	3900	↑	↑
-27	4300		
-28	4700		
-29	5100		
-30	5600	↓	
-31	6200	500	
-32	6800	300	
-33	7500	↑	
-34	8200		
-35	9100	↓	↓
-36	10,000	300	B
-37	10*	500	C
-38	11*	↑	↑
-39	12*		
-40	13		
-41	15		
-42	16		
-43	18		
-44	20	↓	↓
-45	22	500	C

*THESE UNITS HAVE TOLERANCE OF ±0.25 uf

TABLE II (CONT)

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-46	24	500	C
-47	27	↑	↑
-48	30		
-49	33		
-50	36		
-51	39		
-52	43		
-53	47		
-54	51		
-55	56		
-56	62		
-57	68		
-58	75		
-59	82		
-60	91		
-61	100		
-62	110		
-63	120		
-64	130	↓	
-65	150	500	
-66	160	300	
-67	180	↑	
-68	200		
-69	220	↓	↓
-70	240	300	C
-71	220	500	D
-72	240	↑	↑
-73	270		
-74	300		
-75	330		
-76	360		
-77	390		
-78	430		
-79	470	↓	
-80	510	500	
-81	560	300	
-82	620	↑	
-83	680		
-84	750		
-85	820		
-86	910		
-87	1000		
-88	1100		
-89	1200	↓	↓
-90	880	300	D

Ⓒ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 8-14-63
CHECKED A. Marto 8-14-63
APPROVAL AY for G. MAYO 8/14/63
APPROVAL Ellen C Hall 14 Aug 63
NASA APPROVAL W J Rhine 8-14-63
MIT APPROVAL W Kupfer 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H 1006793

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	
C	CHANGES PER TDRR 02616	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	
E	REVISED PER TDRR 04190		WK
F	REVISED PER TDRR 04538	11-13-63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.

E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019. WITH THE NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER AND THE MANUFACTURER'S NAME OR SYMBOL. CAPACITANCE VALUE, TOLERANCE AND THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:

(1) ~~CORE~~ COMPOSITION:
Ni - 45.25% TO 46.75%
C - 0.10% MAX.
Mn - 0.35% - 1.25%
Si - 0.30% MAX.
S - 0.020% MAX.
P - 0.020% MAX.
RESIDUALS - 1.50 MAX.
Fe - BALANCE

(2) CLADDING:
99.92% COPPER, OXYGEN FREE
18-25% BY WEIGHT

(3) PLATING:
ELECTROPLATED 24 KARAT GOLD,
50 MICROINCHES MINIMUM

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

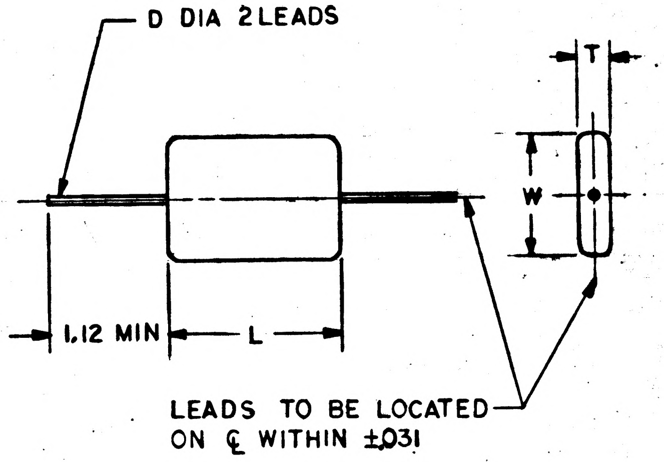
C. DIMENSIONS: PER TABLE I & SKETCH

3. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
D	.516 .422	.297 .234	.156 .063	.021 .019



Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN H. Rennie/JAB DATE 12 JUNE 63
CHECKED 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 13 June 63
NASA APPROVAL 6/13/63
MIT APPROVAL 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

H 1006793

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	THIS SHEET ADDED PER TDRR 02616	8/14/63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK

TABLE II

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-1	560	500	A
-2	620		
-3	680		
-4	750		
-5	820		
-6	910		
-7	1000		
-8	1100		
-9	1200		
-10	1300		
-11	1500		
-12	1600		
-13	1800		
-14	2000		
-15	2200		
-16	2400		
-17	2700		
-18	3000		
-19	3300	500	
-20	3600	300	
-21	3900		
-22	4300		
-23	4700		
-24	5100	300	A
-25	3600	500	B
-26	3900		
-27	4300		
-28	4700		
-29	5100		
-30	5600		
-31	6200	500	
-32	6800	300	
-33	7500		
-34	8200		
-35	9100		
-36	10,000	300	B
-37	10*	500	C
-38	11*		
-39	12*		
-40	13		
-41	15		
-42	16		
-43	18		
-44	20		
-45	22	500	C

*THESE UNITS HAVE TOLERANCE OF ±0.25 uf

TABLE II (CONT)

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-46	24	500	C
-47	27		
-48	30		
-49	33		
-50	36		
-51	39		
-52	43		
-53	47		
-54	51		
-55	56		
-56	62		
-57	68		
-58	75		
-59	82		
-60	91		
-61	100		
-62	110		
-63	120		
-64	130		
-65	150	500	
-66	160	300	
-67	180		
-68	200		
-69	220		
-70	240	300	C
-71	220	500	D
-72	240		
-73	270		
-74	300		
-75	330		
-76	360		
-77	390		
-78	430		
-79	470		
-80	510	500	
-81	560	300	
-82	620		
-83	680		
-84	750		
-85	820		
-86	910		
-87	1000		
-88	1100		
-89	1200		
-90	880	300	D

Ⓒ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 8-14-63
CHECKED A. Marto 8-14-63
APPROVAL AY for G. MAYO 8/14/63
APPROVAL Ellen C Hall 14 Aug 63

NASA APPROVAL W J Rhine 8-14-63

MIT APPROVAL W Kupfer for 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 2 OF 2

MASTER

J 1006793

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	
C	CHANGES PER TDRR 02616	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	
E	REVISED PER TDRR 04490		WK
F	REVISED PER TDRR 04538	11-13-63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK
J	REVISED PER TDRR 26885	3/15/66	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.

E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019. WITH THE NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER AND THE MANUFACTURER'S NAME OR SYMBOL. CAPACITANCE VALUE, TOLERANCE AND THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:

(1) CORE COMPOSITION:
Ni - 45.25% TO 46.75%
C - 0.10% MAX.
Mn - 0.35% - 1.25%
Si - 0.30% MAX.
S - 0.020% MAX.
P - 0.020% MAX.
RESIDUALS - 1.50 MAX.
Fe - BALANCE

(2) CLADDING:
99.92% COPPER, OXYGEN FREE
18-25% BY WEIGHT

(3) PLATING:
ELECTROPLATED 24 KARAT GOLD,
50 MICROINCHES MINIMUM

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

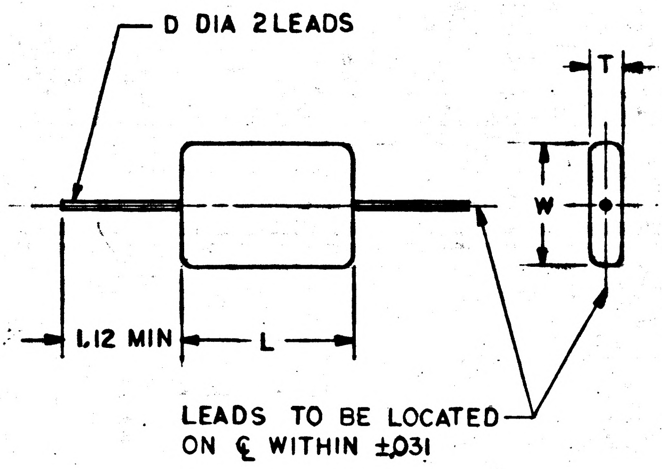
C. DIMENSIONS: PER TABLE I & SKETCH

3. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
D	.516 .422	.297 .234	.156 .063	.021 .019



Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	DRAWN H. Pennix / JAB DATE 12 JUNE 63 CHECKED Maynard 13 JUNE '63 APPROVAL 6/19/63 APPROVAL Eldon C Hall 18 JUNE 63
APPLICATION		MATERIAL SEE NOTES HEAT TREATMENT FINAL FINISH	NASA APPROVAL 6/19/63 MIT APPROVAL 6/19/63

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006793

SCALE NONE WT SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

J 1006793

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	THIS SHEET ADDED PER TDRR 02616	8/14/63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK
J	REVISED PER TDRR 26885	3/15/66	WK

TABLE II

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-1	560	500	A
-2	620		
-3	680		
-4	750		
-5	820		
-6	910		
-7	1000		
-8	1100		
-9	1200		
-10	1300		
-11	1500		
-12	1600		
-13	1800		
-14	2000		
-15	2200		
-16	2400		
-17	2700		
-18	3000		
-19	3300	500	
-20	3600	300	
-21	3900		
-22	4300		
-23	4700		
-24	5100	300	A
-25	3600	500	B
-26	3900		
-27	4300		
-28	4700		
-29	5100		
-30	5600		
-31	6200	500	
-32	6800	300	
-33	7500		
-34	8200		
-35	9100		
-36	10,000	300	B
-37	10*	500	C
-38	11*		
-39	12*		
-40	13		
-41	15		
-42	16		
-43	18		
-44	20		
-45	22	500	C

*THESE UNITS HAVE TOLERANCE OF ±0.25 pf

TABLE II (CONT)

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-46	24	500	C
-47	27		
-48	30		
-49	33		
-50	36		
-51	39		
-52	43		
-53	47		
-54	51		
-55	56		
-56	62		
-57	68		
-58	75		
-59	82		
-60	91		
-61	100		
-62	110		
-63	120		
-64	130		
-65	150	500	
-66	160	300	
-67	180		
-68	200		
-69	220		
-70	240	300	C
-71	220	500	D
-72	240		
-73	270		
-74	300		
-75	330		
-76	360		
-77	390		
-78	430		
-79	470		
-80	510	500	
-81	560	300	
-82	620		
-83	680		
-84	750		
-85	820		
-86	910		
-87	1000		
-88	1100		
-89	1200		
-90	880	300	D

NASA DASH NO.	CAPACITANCE (pf) ±.25%	WORKIND VOLTAGE DC	SIZE
-91	0.5	500	C
-92	1.5		
-93	2.2		
-94	3.0		
-95	3.9		
-96	4.7		
-97	5.6		
-98	6.8		
-99	7.5		
-100	8.2		
-101	9.1	500	C

Ⓒ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN R. Kane DATE 8-14-63
CHECKED A. Marto 8-14-63
APPROVAL AY for G. MAYO 8/14/63
APPROVAL Ellen C Hall 14 Aug 63
NASA APPROVAL W J Rhine 8-14-63
MIT APPROVAL W Kupfer 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 2 OF 2

MASTER

1006793

1006793 K

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	
C	CHANGES PER TDRR 02616	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	
E	REVISED PER TDRR 04190		WK
F	REVISED PER TDRR 04538	11-13-63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK
J	REVISED PER TDRR 26885	3/15/66	WK
K	REVISED PER TDRR 32611	1/20/67	REP / SC

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

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E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019. WITH THE NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER AND THE MANUFACTURER'S NAME OR SYMBOL. CAPACITANCE VALUE, TOLERANCE AND THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:

(1) ~~CORE~~ COMPOSITION:
Ni - 45.25% TO 46.75%
C - 0.10% MAX.
Mn - 0.35% - 1.25%
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S - 0.020% MAX.
P - 0.020% MAX.
RESIDUALS - 1.50 MAX.
Fe - BALANCE

(2) CLADDING:
99.92% COPPER, OXYGEN FREE
18-25% BY WEIGHT

(3) PLATING:
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50 MICROINCHES MINIMUM

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

C. DIMENSIONS: PER TABLE I & SKETCH

3. SPECIAL CONDITIONING (BY SUPPLIER):

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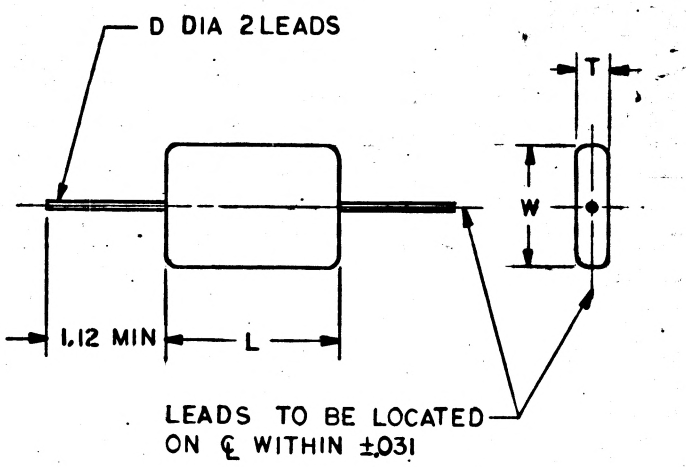
TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
D	.516 .422	.297 .234	.156 .063	.021 .019



Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN H. Rennie / JPD DATE 12 JUNE 63
CHECKED 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 13 JUNE 63
NASA APPROVAL 6/19/63
MIT APPROVAL 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 1 OF 2

1006793 K

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006793 K

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	THIS SHEET ADDED PER TDRR 02616	8/14/63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK
J	REVISED PER TDRR 26885	3/15/66	WK
K	REVISED PER TDRR 32611	1/20/67	REP / SC

TABLE II

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-1	560	500	A
-2	620		
-3	680		
-4	750		
-5	820		
-6	910		
-7	1000		
-8	1100		
-9	1200		
-10	1300		
-11	1500		
-12	1600		
-13	1800		
-14	2000		
-15	2200		
-16	2400		
-17	2700		
-18	3000		
-19	3300	500	
-20	3600	300	
-21	3900		
-22	4300		
-23	4700		
-24	5100	300	A
-25	3600	500	B
-26	3900		
-27	4300		
-28	4700		
-29	5100		
-30	5600		
-31	6200	500	
-32	6800	300	
-33	7500		
-34	8200		
-35	9100		
-36	10,000	300	B
-37	10*	500	C
-38	11*		
-39	12*		
-40	13		
-41	15		
-42	16		
-43	18		
-44	20		
-45	22	500	C

*THESE UNITS HAVE TOLERANCE OF ±0.25 pf

TABLE II (CONT)

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-46	24	500	C
-47	27		
-48	30		
-49	33		
-50	36		
-51	39		
-52	43		
-53	47		
-54	51		
-55	56		
-56	62		
-57	68		
-58	75		
-59	82		
-60	91		
-61	100		
-62	110		
-63	120		
-64	130		
-65	150	500	
-66	160	300	
-67	180		
-68	200		
-69	220		
-70	240	300	C
-71	220	500	D
-72	240		
-73	270		
-74	300		
-75	330		
-76	360		
-77	390		
-78	430		
-79	470		
-80	510	500	
-81	560	300	
-82	620		
-83	680		
-84	750		
-85	820		
-86	910		
-87	1000		
-88	1100		
-89	1200		
-90	880	300	D

NASA DASH NO.	CAPACITANCE (pf) ±.25PF.	WORKIND VOLTAGE DC	SIZE
-91	0.5	500	C
-92	1.5		
-93	2.2		
-94	3.0		
-95	3.9		
-96	4.7		
-97	5.6		
-98	6.8		
-99	7.5		
-100	8.2		
-101	9.1	500	C

Ⓒ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 8-14-63
CHECKED A. Marto 8-14-63
APPROVAL A.J. for G. MAYO 8/14/63
APPROVAL Ellen C Hall 14 Aug 63
NASA APPROVAL W.J. Rhine 8-14-63
MIT APPROVAL 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED, GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006793
SCALE NONE	WT	SHEET 2 OF 2

1006793 K

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006793 L

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REVA WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1635	6/19/63	E.E.L
C	CHANGES PER TDRR 02616.	8/14/63	WK
D	REVISED PER TDRR 02814	8/28/63	
E	REVISED PER TDRR 04490	10	WK
F	REVISED PER TDRR 04538	11-13-63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK
J	REVISED PER TDRR 26885	3/15/66	WK
K	REVISED PER TDRR 32611	1/20/67	REP SC
L	REVISED PER TDRR 33443	7APR67	RM JW

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272, OPERATING TEMPERATURE C, TOLERANCE G, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002045.

E. MARKING: UNITS SHALL BE MARKED WITH THE NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER AND THE MANUFACTURER'S NAME OR SYMBOL PER MIL-STD-130 CAPACITANCE VALUE, TOLERANCE AND THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. LEAD MATERIAL SHALL BE GOLD-PLATED DUMET PER THE FOLLOWING REQUIREMENTS:

(1) CORE COMPOSITION:

Ni - 45.25% TO 46.75%
C - 0.10% MAX.
Mn - 0.35% - 1.25%
Si - 0.30% MAX.
S - 0.020% MAX.
P - 0.020% MAX.
RESIDUALS - 1.50 MAX.
Fe - BALANCE

(2) CLADDING:

99.92% COPPER, OXYGEN FREE
18–25% BY WEIGHT

(3) PLATING:

ELECTROPLATED 24 KARAT GOLD,
50 MICROINCHES MINIMUM

B. CAPACITANCE, WORKING VOLTAGE AND TOLERANCE: PER TABLE II.

C. DIMENSIONS: PER TABLE I & SKETCH

3. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: UNITS SHALL BE SUBJECTED TO 1500 VDC FOR 50 HOURS AT 25°C ± 3°C. AFTER THIS CONDITIONING, ALL UNITS SHALL BE WITHIN TOLERANCE WHEN MEASURED FOR CAPACITANCE, SHALL HAVE A DISSIPATION FACTOR LESS THAN 0.001, AND SHALL HAVE INSULATION RESISTANCE GREATER THAN 1 X 10^{11} OHMS.

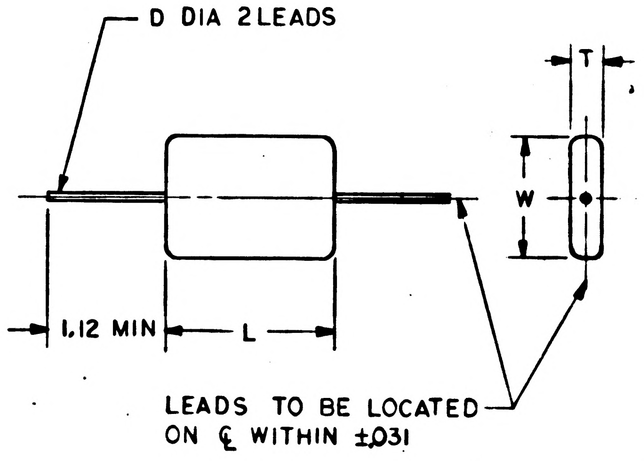


TABLE I

SIZE	L	W	T	D DIA.
A	.796 .672	.467 .375	.186 .094	.026 .024
B	.828 .703	.828 .672	.186 .094	.026 .024
C	.391 .297	.203 .141	.109 .047	.021 .019
D	.516 .422	.297 .234	.156 .063	.021 .019

Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN H. Russell/JFD DATE 2 JUNE 63
CHECKED R. Maynard 13 JUNE '63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 18 JUNE 63
NASA APPROVAL 6/19/63
MIT APPROVAL 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006793
SCALE NONE	WT	SHEET 1 OF 2

1006793 L

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
C	THIS SHEET ADDED PER TDRR 02616	8/14/63	WK
G	REVISED PER TDRR 11502	8/18/64	WK
H	REVISED PER TDRR 14478	12/1/64	WK
J	REVISED PER TDRR 26885	3/15/66	WK
K	REVISED PER TDRR 32611	1/20/67	REP SC
L	REVISION STATUS CHANGED	7APR67	RN DW

TABLE II

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-1	560	500	A
-2	620		
-3	680		
-4	750		
-5	820		
-6	910		
-7	1000		
-8	1100		
-9	1200		
-10	1300		
-11	1500		
-12	1600		
-13	1800		
-14	2000		
-15	2200		
-16	2400		
-17	2700		
-18	3000		
-19	3300	500	
-20	3600	300	
-21	3900		
-22	4300		
-23	4700		
-24	5100	300	A
-25	3600	500	B
-26	3900		
-27	4300		
-28	4700		
-29	5100		
-30	5600		
-31	6200	500	
-32	6800	300	
-33	7500		
-34	8200		
-35	9100		
-36	10,000	300	B
-37	10*	500	C
-38	11*		
-39	12*		
-40	13		
-41	15		
-42	16		
-43	18		
-44	20		
-45	22	500	C

*THESE UNITS HAVE TOLERANCE OF ±0.25 pf

TABLE II (CONT)

NASA DASH NO.	CAPACITANCE (pf) ±2%	WORKING VOLTAGE DC	SIZE
-46	24	500	C
-47	27		
-48	30		
-49	33		
-50	36		
-51	39		
-52	43		
-53	47		
-54	51		
-55	56		
-56	62		
-57	68		
-58	75		
-59	82		
-60	91		
-61	100		
-62	110		
-63	120		
-64	130		
-65	150	500	
-66	160	300	
-67	180		
-68	200		
-69	220		
-70	240	300	C
-71	220	500	D
-72	240		
-73	270		
-74	300		
-75	330		
-76	360		
-77	390		
-78	430		
-79	470		
-80	510	500	
-81	560	300	
-82	620		
-83	680		
-84	750		
-85	820		
-86	910		
-87	1000		
-88	1100		
-89	1200		
-90	880	300	D

NASA DASH NO.	CAPACITANCE (pf) ±.25PF.	WORKIND VOLTAGE DC	SIZE
-91	0.5	500	C
-92	1.5		
-93	2.2		
-94	3.0		
-95	3.9		
-96	4.7		
-97	5.6		
-98	6.8		
-99	7.5		
-100	8.2		
-101	9.1	500	C

Ⓒ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
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DWG. NO. CONTRACT

DRAWN R. Kane DATE 8-14-63
CHECKED A. Marto 8-14-63
APPROVAL Ag for G. MAYO 8/14/63
APPROVAL Ellen C Hall 14 Aug 63
NASA APPROVAL W J Rhine 8-14-63
MIT APPROVAL 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006793
SCALE NONE
WT
SHEET 2 OF 2

1006793

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	ORIGINATED		

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-C-11272, STYLE CY20, OPERATING TEMPERATURE C, TOLERANCE G; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
2. CONSTRUCTION REQUIREMENTS:
   - A. LEADS: IRON-NICKEL ALLOY, COPPER CLAD, GOLD PLATED PER NASA DOCUMENT PS 1015401.

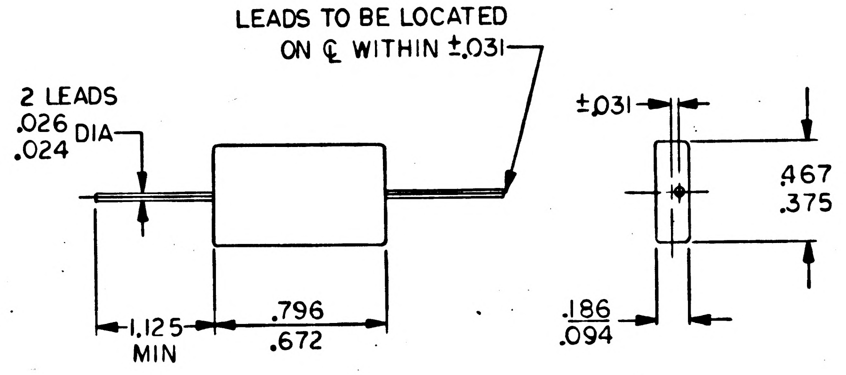
     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
   - B. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL AND TYPE DESIGNATION.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER.
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN NASA SPECIFICATION ND 1015404, CLASS 2
4. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00497 **DATE** 3-6-63



NASA DASH NO.	CAPACITANCE (pf)	WORKING VOLTAGE DC
001	560	500
002	620	
003	680	
004	750	
005	820	
006	910	
007	1000	
008	1100	
009	1200	
010	1300	
011	1500	
012	1600	
013	1800	
014	2000	
015	2200	
016	2400	
017	2700	
018	3000	
019	3300	500
020	3600	300
021	3900	
022	4300	
023	4700	
024	5100	300

ORIGINAL SOURCE OF SUPPLY:

PER QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
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CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane AP DATE 26 Feb. 63
CHECKED B. J. Boucher 2/23/63
APPROVAL [illegible] 3/6/63
APPROVAL
NASA APPROVAL
MIT APPROVAL W. [illegible] 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006793
SCALE NONE WT SHEET 1 OF 1

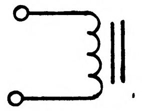
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

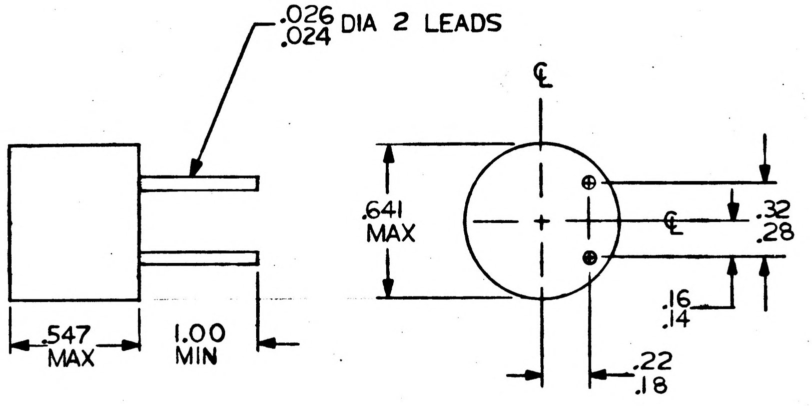
A 1006798

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
–	CLASS A RELEASE PER TDRR 02005	7-17-63	
A	REVISED PER TDRR 02816	8/28/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27 GRADE 5, CLASS S, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - E. MARKING AND PACKAGING:
     - (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130, WITH THE INDUCTANCE VALUE, DIRECT CURRENT RESISTANCE, NASA DRAWING NUMBER, REVISION LETTER AND DATE CODE.
     - (2) PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL PLUS THE NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE, FLEXIBLE GOLD PLATED IRON-NICKEL ALLOY PER ND PS1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE: 50 MICROHENRIES MINIMUM AT 2.2 AMPERES DIRECT CURRENT. TEST FREQUENCY IS 50 KC AT 10 VRMS.
     - (2) DIRECT CURRENT RESISTANCE: 0.08 OHMS MAXIMUM.
     - (3) Q FACTOR: 50 MINIMUM AT 50 KC
     - (4) TEST VOLTAGE: 500 VRMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS
     - (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC
3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: ENCAPSULATED WITH AT LEAST 0.020 COVERAGE OVER THE WINDING.
   - B. MAXIMUM OPERATING CASE TEMPERATURE (UNDER TEST CONDITIONS B1) AT +85°C.
   - C. DIELECTRIC WITHSTANDING VOLTAGE AT 120,000 FEET: 100 VOLTS RMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.
   - D. TERMINAL PULL: UNIT SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS, MINIMUM, WHEN APPLIED WITHOUT SHOCK, FOR 5 SECONDS.
4. SPECIAL CONDITIONING:
   - A. BURN-IN:
     - (1) RUN THE UNIT AT 85°C AMBIENT WITH 2.2 AMPERES DC FLOWING FOR 50 HOURS.
     - (2) WITHIN FOUR (4) HOURS AFTER THE TEST MEASURE THE INDUCTANCE AND DC RESISTANCE.
     - (3) IF THE ABOVE TWO VALUES EXCEED THE SPECIFIED TOLERANCE, OR CHANGE MORE THAN 5% THE UNIT SHALL BE REJECTED.





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 7/1/63
CHECKED 7/10/63
APPROVAL
APPROVAL Eldon C Hall 7/12/63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006798
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006798 A

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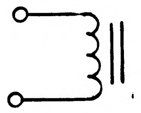
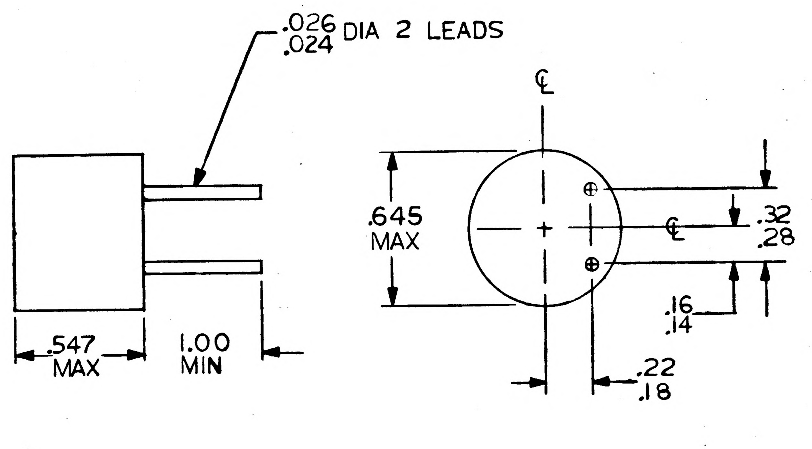
1006798 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
–	CLASS A RELEASE PER TDRR 02005	7-17-63	
A	REVISED PER TDRR 02816	8/28/63	
B	REVISED PER TDRR 14595	6-8-64	W/C

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27 GRADE 5, CLASS S, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - E. MARKING AND PACKAGING:
     - (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130, WITH THE INDUCTANCE VALUE, DIRECT CURRENT RESISTANCE, NASA DRAWING NUMBER, REVISION LETTER AND DATE CODE.
     - (2) PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL PLUS THE NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE, FLEXIBLE GOLD PLATED IRON-NICKEL ALLOY PER ND PS1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE: 50 MICROHENRIES MINIMUM AT 2.2 AMPERES DIRECT CURRENT. TEST FREQUENCY IS 50 KC AT 10 VRMS.
     - (2) DIRECT CURRENT RESISTANCE: 0.08 OHMS MAXIMUM.
     - (3) Q FACTOR: 50 MINIMUM AT 50 KC
     - (4) TEST VOLTAGE: 500 VRMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS
     - (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC
3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: ENCAPSULATED WITH AT LEAST 0.020 COVERAGE OVER THE WINDING.
   - B. MAXIMUM OPERATING CASE TEMPERATURE (UNDER TEST CONDITIONS B1) AT +85°C.
   - C. DIELECTRIC WITHSTANDING VOLTAGE AT 120,000 FEET: 100 VOLTS RMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.
   - D. TERMINAL PULL: UNIT SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS, MINIMUM, WHEN APPLIED WITHOUT SHOCK, FOR 5 SECONDS.
4. SPECIAL CONDITIONING:
   - A. BURN-IN:
     - (1) RUN THE UNIT AT 85°C AMBIENT WITH 2.2 AMPERES DC FLOWING FOR 50 HOURS.
     - (2) WITHIN FOUR (4) HOURS AFTER THE TEST MEASURE THE INDUCTANCE AND DC RESISTANCE.
     - (3) IF THE ABOVE TWO VALUES EXCEED THE SPECIFIED TOLERANCE, OR CHANGE MORE THAN 5% THE UNIT SHALL BE REJECTED.





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 7/1/63
CHECKED 7/10/63
APPROVAL
APPROVAL Eldon C Hall 7/12/63
NASA APPROVAL 5-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006798
SCALE NONE | WT | SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006798 C

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			
–	CLASS A RELEASE PER TDRR 02005	7-17-63	
A	REVISED PER TDRR 02816	8/28/63	
B	REVISED PER TDRR 14595	12-8-64	W/C
C	REVISED PER TDRR 16803	3/2/65	WK

REQUIREMENTS

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27 GRADE 5, CLASS S, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.

   E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, INDUCTANCE VALUE, DIRECT CURRENT RESISTANCE AND DATE OF MANUFACTURE OR CODE.

   F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS 1, CODE 1.
      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND1002215.

2. ACCEPTANCE AND INSPECTION

   A. MECHANICAL PROPERTIES:
      (1) LEAD MATERIAL: WELDABLE, FLEXIBLE GOLD PLATED IRON-NICKEL ALLOY PER ND PS1015401.
      (2) DIMENSIONS AND TOLERANCES: AS SPECIFIED HEREIN.

   B. ELECTRICAL CHARACTERISTICS:
      (1) INDUCTANCE: 50 MICROHENRIES MINIMUM AT 2.2 AMPERES DIRECT CURRENT, ±10%. TEST FREQUENCY IS 50 KC ±1% AT 10 VRMS ±10%.
      (2) DIRECT CURRENT RESISTANCE: 0.08 OHMS MAXIMUM.
      (3) TEST VOLTAGE: 500 VRMS BETWEEN WINDING AND ALL SURFACES.(RESTING ON A METAL PLATE) WITHOUT LEADS
      (4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
      (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.
      (2) CERTIFICATE OF COMPLIANCE WITH ND1015404 CLASS 2.
      (3) BURN-IN TEST DATA.

3. DESIGN:

   A. CONSTRUCTION: ENCAPSULATED WITH AT LEAST 0.020 COVERAGE OVER THE WINDING.

   B. MAXIMUM OPERATING CASE TEMPERATURE (UNDER TEST CONDITIONS B1) AT +85°C.

   C. DIELECTRIC WITHSTANDING VOLTAGE AT 120,000 FEET: 100 VOLTS RMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.

   D. TERMINAL PULL: UNIT SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS, MINIMUM, WHEN APPLIED WITHOUT SHOCK, FOR 5 SECONDS.

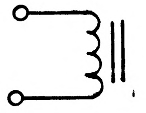
   E. LEAD WORKMANSHIP: LEADS SHALL BE UNIFORM IN QUALITY AND TEMPER: CLEAN, SOUND, SMOOTH AND FREE FROM INJURIOUS FOREIGN MATERIALS.

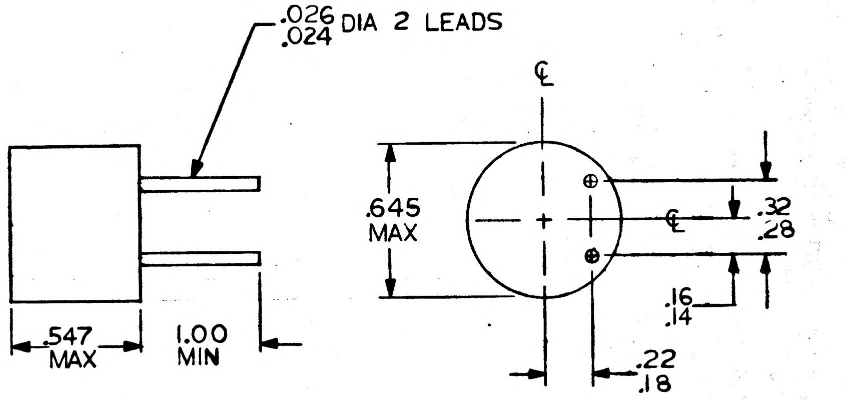
   F. UNIT SHALL BE CAPABLE OF CONTINUOUS UNINTERRURPTED OPERATION.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

4. SPECIAL CONDITIONING:

   A. BURN-IN: BURN-IN SHALL BE PERFORMED BY THE VENDOR.
      (1) RUN THE UNIT AT 85°C AMBIENT WITH 2.2 AMPERES DC FLOWING FOR 50 HOURS.
      (2) WITHIN FOUR (4) HOURS AFTER THE TEST MEASURE THE INDUCTANCE AND DC RESISTANCE.
      (3) IF THE ABOVE TWO VALUES EXCEED THE SPECIFIED TOLERANCE, OR CHANGE MORE THAN 5% THE UNIT SHALL NOT BE SHIPPED.





MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 7/1/63
CHECKED 7/10/63
APPROVAL
APPROVAL Eldon C Hall 7/12/63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006798
SCALE NONE
WT
SHEET 1 OF 1

1006798

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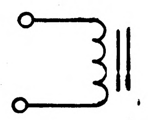
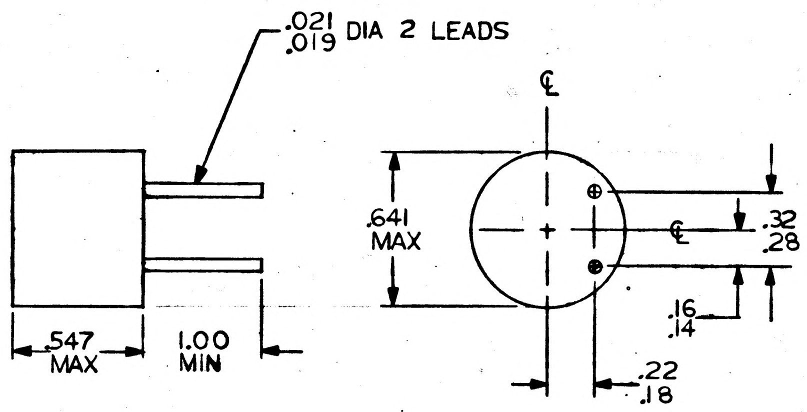
— 1006798

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS A RELEASE PER TDRR 02005	7-17-63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27 GRADE 5, CLASS S, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - E. MARKING AND PACKAGING:
     - (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130, WITH THE INDUCTANCE VALUE, DIRECT CURRENT RESISTANCE, NASA DRAWING NUMBER, REVISION LETTER AND DATE CODE.
     - (2) PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL PLUS THE NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE, FLEXIBLE GOLD PLATED IRON-NICKEL ALLOY PER ND PS1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE: 50 MICROHENRIES MINIMUM AT 2.2 AMPERES DIRECT CURRENT. TEST FREQUENCY IS 50 KC AT 10 VRMS.
     - (2) DIRECT CURRENT RESISTANCE: 0.08 OHMS MAXIMUM.
     - (3) Q FACTOR: 50 MINIMUM AT 50 KC
     - (4) TEST VOLTAGE: 500 VRMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS
     - (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC
3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: ENCAPSULATED WITH AT LEAST 0.020 COVERAGE OVER THE WINDING.
   - B. MAXIMUM OPERATING CASE TEMPERATURE (UNDER TEST CONDITIONS B1) AT +85°C.
   - C. DIELECTRIC WITHSTANDING VOLTAGE AT 120,000 FEET: 100 VOLTS RMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.
   - D. TERMINAL PULL: UNIT SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS, MINIMUM, WHEN APPLIED WITHOUT SHOCK, FOR 5 SECONDS.
4. SPECIAL CONDITIONING:
   - A. BURN-IN:
     - (1) RUN THE UNIT AT 85°C AMBIENT WITH 2.2 AMPERES DC FLOWING FOR 50 HOURS.
     - (2) WITHIN FOUR (4) HOURS AFTER THE TEST MEASURE THE INDUCTANCE AND DC RESISTANCE.
     - (3) IF THE ABOVE TWO VALUES EXCEED THE SPECIFIED TOLERANCE, OR CHANGE MORE THAN 5% THE UNIT SHALL BE REJECTED.





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 7/1/63
CHECKED J. W. McGinty 7/1/63
APPROVAL
APPROVAL Eldon C Hall 7/12/63
NASA APPROVAL W J Rhine 7-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006798
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

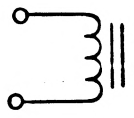
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

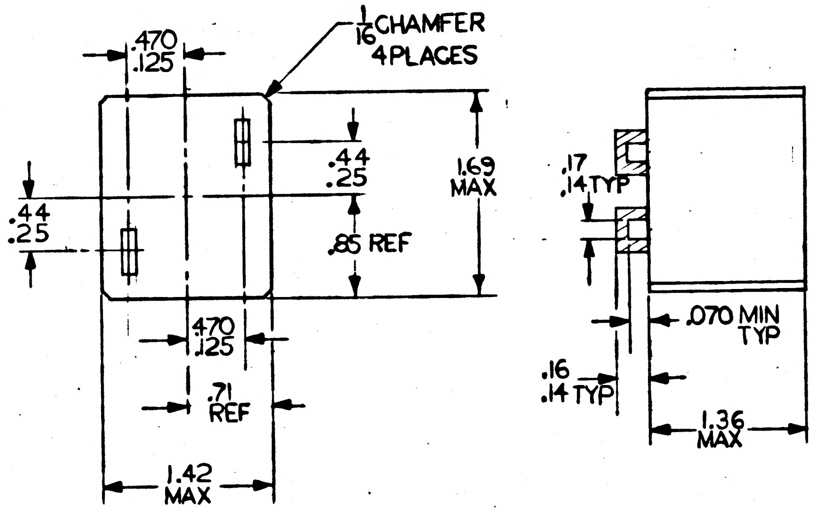
— 0089001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS A RELEASE PER TDRR 02004	7-17-63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27 GRADE 5, CLASS S, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - E. MARKING AND PACKAGING:
     - (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130, WITH THE INDUCTANCE VALUE, DIRECT CURRENT RESISTANCE, NASA DRAWING NUMBER, REVISION LETTER AND DATE CODE.
     - (2) PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL PLUS THE NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SQUARE ANNEALED COPPER WIRE TINNED AND TERMINATED AS SHOWN ON THIS DRAWING.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE: 150 MICROHENRIES MINIMUM AT 8.0 AMPERES DIRECT CURRENT. TEST FREQUENCY IS 50 KC AT 10 VRMS.
     - (2) DIRECT CURRENT RESISTANCE: 0.025 OHMS MAXIMUM.
     - (3) Q FACTOR: 50 MINIMUM AT 50 KC
     - (4) TEST VOLTAGE: 500 VRMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.
     - (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC
3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: ENCAPSULATED WITH AT LEAST 0.030 COVERAGE OVER THE WINDING.
   - B. MAXIMUM OPERATING CASE TEMPERATURE (UNDER TEST CONDITIONS B1) AT +85°C
   - C. DIELECTRIC WITHSTANDING VOLTAGE AT 120,000 FEET: 100 VOLTS RMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.
   - D. TERMINAL PULL: UNIT SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS, MINIMUM, WHEN APPLIED WITHOUT SHOCK, FOR 5 SECONDS.
4. SPECIAL CONDITIONING:
   - A. BURN-IN:
     - (1) RUN THE UNIT AT 85°C AMBIENT WITH 8 AMPERES DC FLOWING FOR 50 HOURS.
     - (2) WITHIN FOUR (4) HOURS AFTER THE TEST MEASURE THE INDUCTANCE AND DC RESISTANCE.
     - (3) IF THE ABOVE TWO VALUES EXCEED THE SPECIFIED TOLERANCE, OR CHANGE MORE THAN 5% THE UNIT SHALL BE REJECTED.





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT
APPLICATION		DO NOT SCALE THIS DRAWING	DRAWN DATE 7/10/63
		MATERIAL SEE NOTES	CHECKED J. M. McGinty 7/12/63
		HEAT TREATMENT	APPROVAL
		FINAL FINISH	APPROVAL Eldon C Hall 7/12/63
			NASA APPROVAL W J Rhine 7-17-63
			MIT APPROVAL L. Hazel 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
	C	1006800	
SCALE	WT		SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

0089001

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1006802 A

REVISIONS "B" 00497 3-6-63

SYM	DESCRIPTION	DATE	APPROVAL
-	ORIGINATED		
A	REPLACED BY REV B WITH CHANGES PER TDRR 02746	8/21/63	[illegible]

NOTES:

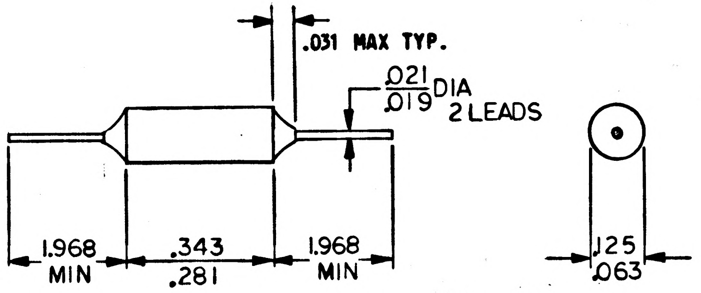
1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-R-26, CHARACTERISTIC G, FOR INSULATED TYPES; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
2. ELECTRICAL REQUIREMENTS:
   - A. NOMINAL RESISTANCE: 10 OHMS.
   - B. RESISTANCE TOLERANCE: ± 1%.
   - C. POWER RATING: 0.5 WATTS.
   - D. TEMPERATURE COEFFICIENT: ± 20 PPM/°C.
   - E. DIELECTRIC VOLTAGE: 500 VOLTS RMS.
   - F. INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM.
3. CONSTRUCTION REQUIREMENTS:
   - A. LEADS: NICKEL ALLOY PER NASA SPECIFICATION PS 1015400.

     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
   - B. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, RESISTANCE, TOLERANCE AND POWER RATING.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA DRAWING NUMBER AND REVISION LETTER.
4. QUALITY ASSURANCE REQUIREMENTS:
   - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA SPECIFICATION ND 1015404, CLASS 2.
5. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
6. BURN-IN-TEST: UNITS SHALL BE SUBJECT TO TWICE ITS RATED WATTAGE AT AMBIENT TEMPERATURE OF 25°C FOR A PERIOD OF 48 HOURS. THE CHANGE IN RESISTANCE AT THE END OF THE BURN-IN PERIOD SHALL NOT BE GREATER THAN 0.06%.

CLASS "B" TDRR 00497 3/6/63



Ⓐ REPLACED BY REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane AP DATE 26 Feb. 63
CHECKED E. F. Brandes 2/28/63
APPROVAL [illegible] 3/6/63
APPROVAL
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006802
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006802 B

REVISIONS B Release TDRR 00497 3-6-63

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02746	8/21/63	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND101504, CLASS 2.

C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002057 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION (3) OF THIS DRAWING.

D. PACKAGING AND PACKING: UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-R-26 AND SHALL INCLUDE THE DRAWING NUMBER (1006802), REVISION LETTER, DASH NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, AND MANUFACTURING DATE OR CODE.

E. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-R-26, CHARACTERISTIC G, FOR INSULATED TYPES; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

1) LEAD DATA: NICKEL LEADS PER PS1015400. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

2) MARKING: THE MANUFACTURER'S NAME SYMBOL, NOMINAL RESISTANCE, RESISTANCE TOLERANCE AND POWER RATING SHALL BE MARKED ON THE PART PER MIL-STD-130.

B. ELECTRICAL REQUIREMENTS:

1) RESISTANCE: 10 OHMS ±1 PER CENT

2) DIELECTRIC STRENGTH: 500 VOLTS RMS

3) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM

3. DESIGN REQUIREMENTS:

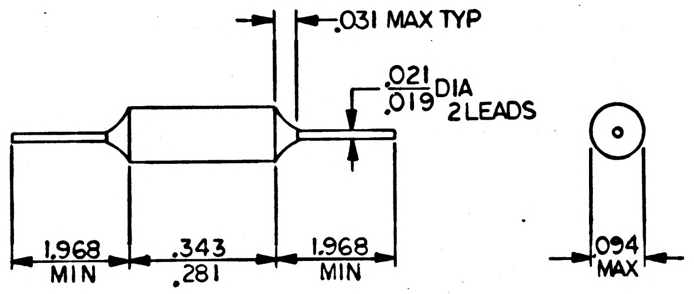
A. POWER RATING: 1/2 WATT AT 25°C

1) DERATING: LINEARLY TO +275°C

B. TEMPERATURE COEFFICIENT OF RESISTANCE: ±20 PPM/°C

4. SPECIAL CONDITIONING:

A. BURN-IN: UNITS SHALL BE SUBJECT TO TWICE ITS RATED WATTAGE AT AN AMBIENT TEMPERATURE OF +25°C FOR A PERIOD OF 48 HOURS. THE CHANGE IN RESISTANCE AT THE END OF THE BURN-IN PERIOD SHALL NOT BE GREATER THAN 0.06%.



Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES

HEAT TREATMENT: NONE

FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 Aug 63
CHECKED G. Matz 8-16-63
APPROVAL R. Bitzer 8-21-63
APPROVAL
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
1/2 W, TC ±20PPM /°C, ±1%
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006802
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006802 C

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS B Release TDRR 00497 3-6-63

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02746	8/21/63	
C	REVISED PER TDRR 11135	7/28/64	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND101504, CLASS 2.

   C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002057 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION (3) OF THIS DRAWING.

   D. PACKAGING AND PACKING: UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-R-26 AND SHALL INCLUDE THE DRAWING NUMBER (1006802), REVISION LETTER, DASH NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, AND MANUFACTURING DATE OR CODE.

   E. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-R-26, CHARACTERISTIC G, FOR INSULATED TYPES; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL REQUIREMENTS:

      1) LEAD DATA: NICKEL LEADS PER PS1015400. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      2) MARKING: THE MANUFACTURER'S NAME SYMBOL, NOMINAL RESISTANCE, RESISTANCE TOLERANCE AND POWER RATING SHALL BE MARKED ON THE PART PER MIL-STD-130.

   B. ELECTRICAL REQUIREMENTS:

      1) RESISTANCE: PER TABLE I

      2) DIELECTRIC STRENGTH: 500 VOLTS RMS

      3) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM

3. DESIGN REQUIREMENTS:

   A. POWER RATING: 1/2 WATT AT 25°C

      1) DERATING: LINEARLY TO +275°C

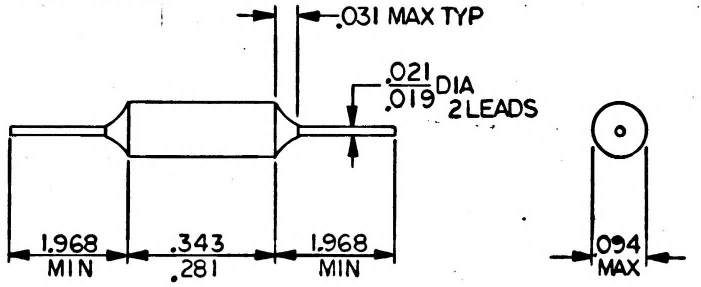
   B. TEMPERATURE COEFFICIENT OF RESISTANCE: ±20 PPM/°C

4. SPECIAL CONDITIONING:

   A. BURN-IN: UNITS SHALL BE SUBJECT TO TWICE ITS RATED WATTAGE AT AN AMBIENT TEMPERATURE OF +25°C FOR A PERIOD OF 48 HOURS. THE CHANGE IN RESISTANCE AT THE END OF THE BURN-IN PERIOD SHALL NOT BE GREATER THAN 0.06%.

TABLE I

NASA DWG NO	RESISTANCE VALUE	TOLERANCE
1006802-1	10 OHMS	± 1%
1006802-2	20 OHMS	± 1%



Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 AUG 63
CHECKED G. Martz 8-16-63
APPROVAL 8-21-63
APPROVAL
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
1/2 W, TC ±20PPM/°C, ±1%
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006802
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006802 D

REVISIONS B Release TDRR 00497 3-6-63

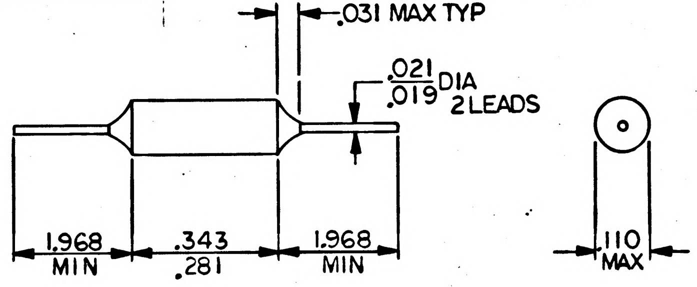
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02746	8/21/63	
C	REVISED PER TDRR 11135	7/28/64	WK
D	REVISED PER TDRR 16052	2/5/65	WK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND101504, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002057 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION (3) OF THIS DRAWING.
   - D. PACKAGING AND PACKING: UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-R-26 AND SHALL INCLUDE THE DRAWING NUMBER (1006802), REVISION LETTER, DASH NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, AND MANUFACTURING DATE OR CODE.
   - E. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-R-26, CHARACTERISTIC G, FOR INSULATED TYPES; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - 1) LEAD DATA: NICKEL LEADS PER PS1015400. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 2) MARKING: THE MANUFACTURER'S NAME SYMBOL, NOMINAL RESISTANCE, RESISTANCE TOLERANCE AND POWER RATING SHALL BE MARKED ON THE PART PER MIL-STD-130.
   - B. ELECTRICAL REQUIREMENTS:
     - 1) RESISTANCE: PER TABLE I
     - 2) DIELECTRIC STRENGTH: 500 VOLTS RMS
     - 3) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/2 WATT AT 25°C
     - 1) DERATING: LINEARLY TO +275°C
   - B. TEMPERATURE COEFFICIENT OF RESISTANCE: ±20 PPM/°C
4. SPECIAL CONDITIONING:
   - A. BURN-IN: UNITS SHALL BE SUBJECT TO TWICE ITS RATED WATTAGE AT AN AMBIENT TEMPERATURE OF +25°C FOR A PERIOD OF 48 HOURS. THE CHANGE IN RESISTANCE AT THE END OF THE BURN-IN PERIOD SHALL NOT BE GREATER THAN 0.06%.

TABLE I

NASA DWG NO	RESISTANCE VALUE	TOLERANCE
1006802-1	10 OHMS	± 1%
1006802-2	20 OHMS	± 1%



Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 AUG 63
CHECKED G. Martz 8-16-63
APPROVAL 8-21-63
APPROVAL
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
1/2 W, TC ±20PPM/°C, ±1%
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006802
SCALE NONE
WT
SHEET 1 OF 1

1006802 E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS B Release TDRR 00497 3-6-63

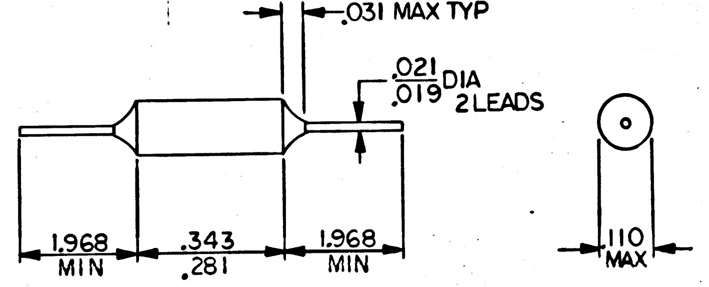
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02746	8/21/63	DW
C	REVISED PER TDRR 11135	7/29/64	WR
D	REVISED PER TDRR 16052	2/5/65	WR
E	REVISED PER TDRR 16588	2/24/65	WR

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002057 UNLESS MODIFIED OR AMENDED BY THE DESIGN REQUIREMENTS SECTION (3) OF THIS DRAWING.
   - D. PACKAGING AND PACKING: UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-R-26 AND SHALL INCLUDE THE DRAWING NUMBER (1006802), REVISION LETTER, DASH NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, AND MANUFACTURING DATE OR CODE.
   - E. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-R-26, CHARACTERISTIC G, FOR INSULATED TYPES; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL REQUIREMENTS:
     - 1) LEAD DATA: NICKEL LEADS PER PS1015400. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - 2) MARKING: THE MANUFACTURER'S NAME SYMBOL, NOMINAL RESISTANCE, RESISTANCE TOLERANCE AND POWER RATING SHALL BE MARKED ON THE PART PER MIL-STD-130.
   - B. ELECTRICAL REQUIREMENTS:
     - 1) RESISTANCE: PER TABLE I
     - 2) DIELECTRIC STRENGTH: 500 VOLTS RMS
     - 3) INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 1/2 WATT AT 25°C
     - 1) DERATING: LINEARLY TO +275°C
   - B. TEMPERATURE COEFFICIENT OF RESISTANCE: ±20 PPM/°C
4. SPECIAL CONDITIONING:
   - A. BURN-IN: UNITS SHALL BE SUBJECT TO TWICE ITS RATED WATTAGE AT AN AMBIENT TEMPERATURE OF +25°C FOR A PERIOD OF 48 HOURS. THE CHANGE IN RESISTANCE AT THE END OF THE BURN-IN PERIOD SHALL NOT BE GREATER THAN 0.06%.

TABLE I

NASA DWG NO	RESISTANCE VALUE	TOLERANCE
1006802-1	10 OHMS	± 1%
1006802-2	20 OHMS	± 1%
1006802-3	5 OHMS	± 1%
1006802-4	15 OHMS	± 1%



Ⓑ REPLACES REV A WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 16 Aug 63
CHECKED G. Martz 8-16-63
APPROVAL 8-21-63
APPROVAL
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND
1/2 W, TC ±20PPM/°C, ±1%
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006802
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006802

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	ORIGINATED		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF SPECIFICATION MIL-R-26, CHARACTERISTIC G, FOR INSULATED TYPES; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
2. ELECTRICAL REQUIREMENTS:
   - A. NOMINAL RESISTANCE: 10 OHMS.
   - B. RESISTANCE TOLERANCE: ± 1%.
   - C. POWER RATING: 0.5 WATTS.
   - D. TEMPERATURE COEFFICIENT: ± 20 PPM/°C.
   - E. DIELECTRIC VOLTAGE: 500 VOLTS RMS.
   - F. INSULATION RESISTANCE: 5000 MEGOHMS MINIMUM.
3. CONSTRUCTION REQUIREMENTS:
   - A. LEADS: NICKEL ALLOY PER NASA SPECIFICATION PS 1015400.

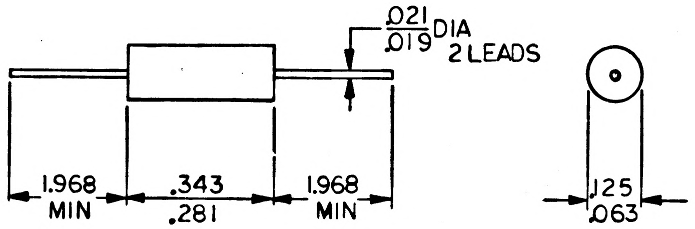
     A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

     EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION, THEN BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
   - B. MARKING: MARK UNITS PER MIL-STD-130 WITH MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, RESISTANCE, TOLERANCE AND POWER RATING.

     MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA DRAWING NUMBER AND REVISION LETTER.
4. QUALITY ASSURANCE REQUIREMENTS:
   - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN NASA SPECIFICATION ND 1015404, CLASS 2.
5. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00497 DATE 3-6-63



1006802

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 26 Feb. 63
CHECKED E. F. Brucher 2/28/63
APPROVAL 3/6/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 6 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006802
SCALE NONE	WT	SHEET 1 OF 1

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∀ 9089001

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REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A DOUBLE COATED, THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE WITH A DOUBLE LINER.

B. TEMPERATURE RANGE: -55° TO +130°C.

C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.

D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.

E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

(1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

F. CHARACTERISTICS:

(1) THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ± 0.0005, CONDITION C-96/23/50.

(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

(3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.

(4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.

(5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.

(6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.

(7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.

(8) BOND SEPARATION AFTER CURE: 30 MINUTES.

(9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)

(10) ELONGATION: 55 PERCENT, MAXIMUM.

TABLE I

PHYSICAL PROPERTIES

DASH NUMBER	WIDTH	LENGTH PER ROLL
-1	0.800 ± .002	36 YDS
-2	1.400 ± .002	36 YDS
-3	.600 ± .002	36 YDS
-4	.500 ± .002	36 YDS
-5	.700 ± .002	36 YDS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
NONE
FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN A. Yelany DATE 16 APR 63
CHECKED A. Maynard 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE, DOUBLE COATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

∀ 9089001

B	9089001

REVISIONS TDRR 01101			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	
B	REVISED PER TDRR 02620	8/14/63	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.
   - E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. PHYSICAL PROPERTIES: PER TABLE I.
   - B. MARKING: PER PARAGRAPH 1 E.
3. DESIGN:
   - A. TAPE SHALL BE A DOUBLE COATED, THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE WITH A DOUBLE LINER.
   - B. TEMPERATURE RANGE: -55° TO +130°C.
   - C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.
   - D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.
   - E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.
     - (1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.
   - F. CHARACTERISTICS:
     - (1) THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ± 0.0005, CONDITION C-96/23/50.
     - (2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.
     - (5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.
     - (6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.
     - (7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
       25 OUNCES PER INCH WIDTH, CONDITION E-2/130.
     - (8) BOND SEPARATION AFTER CURE: 30 MINUTES.
     - (9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)
     - (10) ELONGATION: 55 PERCENT, MAXIMUM.

TABLE I

PHYSICAL PROPERTIES		
DASH NUMBER	WIDTH	LENGTH PER ROLL
-1	0.800 ± .002	36 YDS
-2	1.400 ± .002	36 YDS
-3	.600 ± .002	36 YDS
-4	.500 ± .002	36 YDS
-5	.700 ± .002	36 YDS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 16 APR 63
CHECKED 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL
NASA APPROVAL 15-1-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE, DOUBLE COATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006806
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	
B	REVISED PER TDRR 02620	8/14/63	wk
C	REVISED PER TDRR 02813	8/28/63	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A MYLAR, POLYESTER FILM, THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE.

B. TEMPERATURE RANGE: -55° TO +130°C.

C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F., OR 2 HOURS AT +275°F., OR 1 HOUR AT +300°F., OR 24 HOURS IN AIR.

D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I

E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

(1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

F. CHARACTERISTICS:

(1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.
(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.
(3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.
(4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.
(5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.
(6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.
(7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.
(8) BOND SEPARATION AFTER CURE: 30 MINUTES.
(9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)
(10) ELONGATION: 55 PERCENT, MAXIMUM.
(11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES				
DASH NO.	WIDTH	COATING	LINER	THICKNESS
-1	0.800 ± .002	DOUBLE	DOUBLE	.0045 .0035
-2	1.400 ± .002	DOUBLE	DOUBLE	.0045 .0035
-3	0.600 ± .002	DOUBLE	DOUBLE	.0045 .0035
-4	0.500 ± .002	DOUBLE	DOUBLE	.0045 .0035
-5	0.700 ± .002	DOUBLE	DOUBLE	.0045 .0035
-6	0.188 ± .002	DOUBLE	DOUBLE	.0045 .0035
-7	0.500 ± .005	SINGLE	NONE	.004 .002
-8	0.700 ± .005	SINGLE	NONE	.004 .002
-9	0.800 ± .005	SINGLE	NONE	.004 .002

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN A. Yeberg DATE 16 APR 63
CHECKED A. Maynard 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 9089001

REVISIONS TDRR 01101			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	
B	REVISED PER TDRR 02620	8/14/63	WK
C	REVISED PER TDRR 02813	8/28/63	
D	REVISED PER TDRR 03512	30 8 63	WK

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REQUIREMENTS:

1. GENERAL:
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   - B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.
   - E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. PHYSICAL PROPERTIES: PER TABLE I.
   - B. MARKING: PER PARAGRAPH 1 E.
3. DESIGN:
   - A. TAPE SHALL BE A MYLAR, POLYESTER FILM, THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE.
   - B. TEMPERATURE RANGE: -55° TO +130°C.
   - C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.
   - D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I
     - 1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @ .300 ± 010 FROM EACH EDGE
   - E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.
     - (1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.
   - F. CHARACTERISTICS:
     - (1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.
     - (2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.
     - (5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.
     - (6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.
     - (7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.
     - (8) BOND SEPARATION AFTER CURE: 30 MINUTES.
     - (9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)
     - (10) ELONGATION: 55 PERCENT, MAXIMUM.
     - (11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES					
DASH NO.	WIDTH	COATING	LINER	THICKNESS	
-1	0.800 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-2	1.400 ± .002	DOUBLE	DOUBLE	.0045 .0035	SEE NOTE 3.D.1
-3	0.600 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-4	0.500 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-5	0.700 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-6	0.188 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-7	0.500 ± .005	SINGLE	NONE	.004 .002	
-8	0.700 ± .005	SINGLE	NONE	.004 .002	
-9	0.800 ± .005	SINGLE	NONE	.004 .002	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL SEE NOTES	DRAWN A. Yelang DATE 16 APR 63 CHECKED Maynard 16 APR 63 APPROVAL W. B. Turner 30 APR 63 APPROVAL	INSULATION TAPE, ELECTRICAL THERMOSETTING ADHESIVE SPECIFICATION CONTROL DRAWING
		HEAT TREATMENT NONE	NASA APPROVAL W J Rhine 5-1-63	CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006806
		FINAL FINISH NONE	MIT APPROVAL	SCALE NONE WT SHEET 1 OF 1

E 9089001

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS TDRR 01101			
—			
A	REVISED PER TDRR 02393	8/7/63	
B	REVISED PER TDRR 02620	8/14/63	WK
C	REVISED PER TDRR 02813	8/28/63	
D	REVISED PER TDRR 03512	30 Oct 63	WK
E	REVISED PER TDRR 04001.	1 Dec 63	WK

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   - D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I
     1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @ .300 ± 010 FROM EACH EDGE
   - E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.
     - (1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.
   - F. CHARACTERISTICS:
     - (1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.
     - (2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.
     - (5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.
     - (6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.
     - (7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50. 25 OUNCES PER INCH WIDTH, CONDITION E-2/130.
     - (8) BOND SEPARATION AFTER CURE: 30 MINUTES.
     - (9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)
     - (10) ELONGATION: 55 PERCENT, MAXIMUM.
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TABLE I

PHYSICAL PROPERTIES					
DASH NO.	WIDTH	COATING	LINER	THICKNESS	
-1	0.800 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-2	1.400 ± .002	DOUBLE	DOUBLE	.0045 .0035	SEE NOTE 3.D.1
-3	0.600 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-4	0.500 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-5	0.700 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-6	0.188 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-7	0.500 ± .005	SINGLE	NONE	.004 .002	
-8	0.700 ± .005	SINGLE	NONE	.004 .002	
-9	0.800 ± .005	SINGLE	NONE	.004 .002	
-10	0.900 ± .005	DOUBLE	DOUBLE	.0045/.0035	
-11	0.800 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-12	1.400 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-13	.500 ± .002	DOUBLE	DOUBLE	.0055/.0045	

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

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LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Yelang DATE 16 APR 63
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APPROVAL W. Turner 30 APR 63
APPROVAL
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL 1 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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F 1006806

REVISIONS TDRR 0110			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	[illegible]
B	REVISED PER TDRR 02620	8/14/63	WK
C	REVISED PER TDRR 02813	8/28/63	[illegible]
D	REVISED PER TDRR 03512	30Aug63	WK
E	REVISED PER TDRR 04001	[illegible]	WK
F	REVISED PER TDRR 04182	10/30/63	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A MYLAR, POLYESTER FILM, THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE.

B. TEMPERATURE RANGE: -55° TO +130°C.

C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.

D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I

1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @ .300 ± 010 FROM EACH EDGE.

E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

(1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

F. CHARACTERISTICS:

(1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.

(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

(3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.

(4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.

(5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.

(6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.

(7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.

(8) BOND SEPARATION AFTER CURE: 30 MINUTES.

(9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)

(10) ELONGATION: 55 PERCENT, MAXIMUM.

(11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES					
DASH NO.	WIDTH	COATING	LINER	THICKNESS	
-1	0.800 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-2	1.400 ± .002	DOUBLE	DOUBLE	.0045 .0035	SEE NOTE 3.D.1
-3	0.600 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-4	0.500 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-5	0.700 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-6	0.188 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-7	0.500 ± .005	SINGLE	NONE	.004 .002	
-8	0.700 ± .005	SINGLE	NONE	.004 .002	
-9	0.800 ± .005	SINGLE	NONE	.004 .002	
-10	0.900 ± .005	DOUBLE	DOUBLE	.0045/.0035	
-11	0.800 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-12	1.400 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-13	.500 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-14	0.700 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-15	0.700 ± .005	SINGLE	NONE	.005/.003	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Yelong DATE 16 APR 63
CHECKED [illegible] 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL
NASA APPROVAL [illegible] 5-1-63
MIT APPROVAL [illegible] 1 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006806 G

REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	
B	REVISED PER TDRR 02620	8/14/63	WK
C	REVISED PER TDRR 02813	8/28/63	
D	REVISED PER TDRR 03512	30 Oct 63	WK
E	REVISED PER TDRR 04001	[illegible]	WK
F	REVISED PER TDRR 04182	10/30/63	WK
G	REVISED PER TDRR 06955	2/17/64	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A MYLAR, POLYESTER FILM, THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE.

B. TEMPERATURE RANGE: -55° TO +130°C.

C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F., OR 2 HOURS AT +275°F., OR 1 HOUR AT +300°F., OR 24 HOURS IN AIR.

D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I.

1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @ .300 ± 010 FROM EACH EDGE.

E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

(1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

F. CHARACTERISTICS:

(1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.

(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

(3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.

(4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.

(5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.

(6) INSULATION RESISTANCE: 1 X 10^6 MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.

(7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.

(8) BOND SEPARATION AFTER CURE: 30 MINUTES.

(9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)

(10) ELONGATION: 55 PERCENT, MAXIMUM.

(11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	
-1	0.800 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-2	1.400 ± .002	DOUBLE	DOUBLE	.0045 .0035	SEE NOTE 3.D.1
-3	0.600 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-4	0.500 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-5	0.700 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-6	0.188 ± .002	DOUBLE	DOUBLE	.0045 .0035	
-7	0.500 ± .005	SINGLE	NONE	.004 .002	
-8	0.700 ± .005	SINGLE	NONE	.004 .002	
-9	0.800 ± .005	SINGLE	NONE	.004 .002	
-10	0.900 ± .005	DOUBLE	DOUBLE	.0045/.0035	
-11	0.800 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-12	1.400 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-13	.500 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-14	0.700 ± .002	DOUBLE	DOUBLE	.0055/.0045	
-15	0.700 ± .005	SINGLE	NONE	.005/.003	
-16	0.600 ± .005	SINGLE	SINGLE	.021/.011	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN A. Yelenz DATE 16 APR 63
CHECKED A. Maynard 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL

NASA APPROVAL W J Rhine 5-1-63

MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H	9089001

REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	5/7/63	
B	REVISED PER TDRR 02620	8/14/63	WK
C	REVISED PER TDRR 02813	8/24/63	
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E	REVISED PER TDRR 04001	17[illegible]63	WK
F	REVISED PER TDRR 04182	10/30/63	WK
G	REVISED PER TDRR 06955	3/17/64	WK
H	REVISED PER TDRR 10115	6/16/64	

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REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.
   - E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.
2. ACCEPTANCE AND INSPECTION:
   - A. PHYSICAL PROPERTIES: PER TABLE I.
   - B. MARKING: PER PARAGRAPH 1 E.
   - C. TAPE SHALL BE A MYLAR, POLYESTER FILM, WITH A THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE. SUPPLIER SHALL CERTIFY THAT TYPE A (CLEAR) MYLAR OR EQUIVALENT WAS USED TO FABRICATE SHIPMENT.
   - D. THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.
3. DESIGN:
   - B. TEMPERATURE RANGE: -55° TO +130°C.
   - C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.
   - D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I.
     - 1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE 0.300 ± .010 FROM EACH EDGE.
   - E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.
     - (1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.
   - F. CHARACTERISTICS: (TYPICAL)
     - (1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I.
     - (2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (3) ADHESION TO STEEL: 30 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.
     - (5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.
     - (6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.
     - (7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
       25 OUNCES PER INCH WIDTH, CONDITION E-2/130.
     - (8) BOND SEPARATION AFTER CURE: 30 MINUTES.
     - (9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)
     - (10) ELONGATION: 55 PERCENT, MAXIMUM.
     - (11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-1	0.800 ± .002	DOUBLE	DOUBLE	.0045 .0035	YELLOW
-2	1.400 ± .002	DOUBLE	DOUBLE	.0045 .0035	"
-3	0.600 ± .002	DOUBLE	DOUBLE	.0045 .0035	"
-4	0.500 ± .002	DOUBLE	DOUBLE	.0045 .0035	"
-5	0.700 ± .002	DOUBLE	DOUBLE	.0045 .0035	"
-6	0.188 ± .002	DOUBLE	DOUBLE	.0045 .0035	"
-7	0.500 ± .005	SINGLE	NONE	.004 .002	"
-8	0.700 ± .005	SINGLE	NONE	.004 .002	"
-9	0.800 ± .005	SINGLE	NONE	.004 .002	"
-10	0.900 ± .005	DOUBLE	DOUBLE	.0045/.0035	"
-11	0.800 ± .002	DOUBLE	DOUBLE	.0055/.0045	"
-12	1.400 ± .002	DOUBLE	DOUBLE	.0055/.0045	"
-13	.500 ± .002	DOUBLE	DOUBLE	.0055/.0045	"
-14	0.700 ± .002	DOUBLE	DOUBLE	.0055/.0045	"
-15	0.700 ± .005	SINGLE	NONE	.005/.003	"
-16	0.600 ± .005	SINGLE	SINGLE	.021/.011	"

SEE NOTE 3.D.1.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Yelong DATE 16 APR 63
CHECKED Maynard 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL
NASA APPROVAL 15-1-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006806
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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ↄ 9089001

REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
—			
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B	REVISED PER TDRR 02620	8/14/63	WK
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E	REVISED PER TDRR 04001.	1Oct63	WK
F	REVISED PER TDRR 04182	10/30/63	WK
G	REVISED PER TDRR 06955	3/17/64	WK
H	REVISED PER TDRR 10115	6/16/64	
J	REVISED PER TDRR 16805	3/2/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

C. TAPE SHALL BE A MYLAR, POLYESTER FILM, WITH A THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE. SUPPLIER SHALL CERTIFY THAT TYPE A (CLEAR) MYLAR OR EQUIVALENT WAS USED TO FABRICATE SHIPMENT.

D. THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.

3. DESIGN:

B. TEMPERATURE RANGE: -55° TO +130°C.

C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F., OR 2 HOURS AT +275°F., OR 1 HOUR AT +300°F., OR 24 HOURS IN AIR.

D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I.

1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @.300 ± 010 FROM EACH EDGE.

E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

(1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

F. CHARACTERISTICS: (TYPICAL)

(1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I

(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

(3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.

(4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.

(5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.

(6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.

(7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.

(8) BOND SEPARATION AFTER CURE: 30 MINUTES.

(9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)

(10) ELONGATION: 55 PERCENT, MAXIMUM.

(11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-1	0.800 ± .002	DOUBLE	DOUBLE	.0066 .0056	YELLOW
-2	1.400 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-3	0.600 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-4	0.500 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-5	0.700 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-6	0.188 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-7	0.500 ± .005	SINGLE	NONE	.004 .002	"
-8	0.700 ± .005	SINGLE	NONE	.004 .002	"
-9	0.800 ± .005	SINGLE	NONE	.004 .002	"
-10	0.900 ± .005	DOUBLE	DOUBLE	.0066/.0056	"
-11	0.800 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-12	1.400 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-13	.500 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-14	0.700 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-15	0.700 ± .005	SINGLE	NONE	.005/.003	"
-16	0.600 ± .005	SINGLE	SINGLE	.021/.011	"
-17	0.218 ± .002	SINGLE	NONE	.004/.002	"

SEE NOTE 3.D.1.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN A. Yelang DATE 16 APR 63
CHECKED A. Maynard 16 APR 63
APPROVAL W. E. Turner 30 APR 63
APPROVAL
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006806

SCALE NONE WT SHEET 1 OF 1

1006806 K

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	
B	REVISED PER TDRR 02620	8/14/63	WK
C	REVISED PER TDRR 02813	8/28/63	
D	REVISED PER TDRR 03512	30 Oct 63	WK
E	REVISED PER TDRR 04001	1 Dec 63	WK
F	REVISED PER TDRR 04182	10/30/63	WK
G	REVISED PER TDRR 06955	3/17/64	WK
H	REVISED PER TDRR 10115	6/16/64	
J	REVISED PER TDRR 16805	3/2/65	WK
K	REVISED PER TDRR 17477	3-23-65	WK.

REVISIONS TDRR 01101

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REQUIREMENTS:

1. GENERAL:

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B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

C. TAPE SHALL BE A MYLAR, POLYESTER FILM, WITH A THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE. SUPPLIER SHALL CERTIFY THAT TYPE A (CLEAR) MYLAR OR EQUIVALENT WAS USED TO FABRICATE SHIPMENT.

D. THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.

3. DESIGN:

B. TEMPERATURE RANGE: -55° TO +130°C.

C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.

D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I.

1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE 0.300 ± 010 FROM EACH EDGE.

E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

(1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

F. CHARACTERISTICS: (TYPICAL)

(1) THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I

(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

(3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.

(4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.

(5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.

(6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.

(7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.

(8) BOND SEPARATION AFTER CURE: 30 MINUTES.

(9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)

(10) ELONGATION: 55 PERCENT, MAXIMUM.

(11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-1	0.800 ± .002	DOUBLE	DOUBLE	.0066 .0056	YELLOW
-2	1.400 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-3	0.600 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-4	0.500 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-5	0.700 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-6	0.188 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-7	0.500 ± .005	SINGLE	NONE	.004 .002	"
-8	0.700 ± .005	SINGLE	NONE	.004 .002	"
-9	0.800 ± .005	SINGLE	NONE	.004 .002	"
-10	0.900 ± .005	DOUBLE	DOUBLE	.0066/.0056	"
-11	0.800 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-12	1.400 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-13	.500 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-14	0.700 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-15	0.700 ± .005	SINGLE	NONE	.005/.003	"
-16	0.600 ± .005	SINGLE	SINGLE	.021/.011	"
-17	0.218 ± .002	SINGLE	NONE	.004/.002	"
-18	0.218 ± .002	DOUBLE	DOUBLE	.0045/.0035	"

SEE NOTE 3.D.1.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Yelang DATE 16 APR 63
CHECKED Maynard 16 APR 63
APPROVAL W. E. Turner 30 APR 63
APPROVAL
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006806
SCALE NONE WT SHEET 1 OF 1

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9089001

REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
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B	REVISED PER TDRR 02620	8/14/63	WK
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F	REVISED PER TDRR 04182	10/30/63	WK
G	REVISED PER TDRR 06955	3/17/64	WK
H	REVISED PER TDRR 10115	6/16/64	
J	REVISED PER TDRR 16805	3/2/65	WK
K	REVISED PER TDRR 17477	3-23-65	WK.
L	REVISED PER TDRR 18240	4/27/65	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

C. TAPE SHALL BE A MYLAR, POLYESTER FILM, WITH A THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE. SUPPLIER SHALL CERTIFY THAT TYPE A (CLEAR) MYLAR OR EQUIVALENT WAS USED TO FABRICATE SHIPMENT.

D. THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.

3. DESIGN:

B. TEMPERATURE RANGE: -55° TO +130°C.

C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.

D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I.

1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @.300 ± .010 FROM EACH EDGE.

E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

(1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

F. CHARACTERISTICS: (TYPICAL)

(1) [illegible]

(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

(3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.

(4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.

(5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.

(6) INSULATION RESISTANCE: 1 X 10^6 MEGOHMS, MINIMUM AT 500 VOLTS DC, TION C-96/23/96.

(7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.

(8) BOND SEPARATION AFTER CURE: 30 MINUTES.

(9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)

(10) ELONGATION: 55 PERCENT, MAXIMUM.

(11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-1	0.800 ± .002	DOUBLE	DOUBLE	.0066 .0056	YELLOW
-2	1.400 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-3	0.600 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-4	0.500 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-5	0.700 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-6	0.188 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-7	0.500 ± .005	SINGLE	NONE	.004 .002	"
-8	0.700 ± .005	SINGLE	NONE	.004 .002	"
-9	0.800 ± .005	SINGLE	NONE	.004 .002	"
-10	0.900 ± .005	DOUBLE	DOUBLE	.0066/.0056	"
-11	0.800 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-12	1.400 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-13	.500 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-14	0.700 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-15	0.700 ± .005	SINGLE	NONE	.005/.003	"
-16	0.600 ± .005	SINGLE	SINGLE	.021/.011	"
-17	0.218 ± .002	SINGLE	NONE	.004/.002	"
-18	0.218 ± .002	DOUBLE	DOUBLE	.0045/.0035	"
-19	.060±.002	SINGLE	NONE	.003/.005	"
-20	.334±.002	SINGLE	NONE	.003/.005	"
-21	.502±.002	SINGLE	NONE	.003/.005	"

SEE NOTE 3.D.1.

TABLE I CONTINUED

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-22	.295±.002	SINGLE	NONE	.003/.005	YELLOW
-23	.087±.002	SINGLE	NONE	.003/.005	YELLOW
-24	0.400±.005	SINGLE	NONE	.005/.003	YELLOW

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN A. Yelang DATE 16 APR 63
CHECKED Maynard 16 APR 63
APPROVAL W. Turner 30 APR 63
APPROVAL

NASA APPROVAL W J Rhine 5-1-63

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INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006806

SCALE NONE WT SHEET 1 OF 1

N 9089001

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N	REVISED PER TDRR 21413	8/24/65	WK

TABLE I CONTINUED

PHYSICAL PROPERTIES					
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-25	0.600±.005	TRIPLE	SINGLE	.021/.011	YELLOW
-26	.188±.010	SINGLE	SINGLE	.005/.003	YELLOW

REQUIREMENTS:

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F. CHARACTERISTICS: (TYPICAL)

(1) [illegible]

(2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

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(8) BOND SEPARATION AFTER CURE: 30 MINUTES.

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(10) ELONGATION: 55 PERCENT, MAXIMUM.

(11) LENGTH PER ROLL: 36 YDS.

TABLE I

SEE NOTE 3.D.1. (for -2)

PHYSICAL PROPERTIES					
DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
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-3	0.600 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
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-6	0.188 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-7	0.500 ± .005	SINGLE	NONE	.004 .002	"
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-11	0.800 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
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-13	.500 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
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-15	0.700 ± .005	SINGLE	NONE	.005/.003	"
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-19	.060±.002	SINGLE	NONE	.003/.005	"
-20	.334±.002	SINGLE	NONE	.003/.005	"
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LIST OF MATERIALS			

MASTER

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NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT INSTRUMENTATION LAB
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DRAWN A. Yelang DATE 16 APR 63
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INSULATION TAPE, ELECTRICAL
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006806

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d 9089001

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P	REVISED PER TDRR 22436	9/16/65	WK

REQUIREMENTS:

1. GENERAL:
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   - B. MATERIAL SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-I-15126, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
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   - D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.
   - E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.
2. ACCEPTANCE AND INSPECTION:
   - A. PHYSICAL PROPERTIES: PER TABLE I.
   - B. MARKING: PER PARAGRAPH 1 E.
   - C. TAPE SHALL BE A MYLAR, POLYESTER FILM, WITH A THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE. SUPPLIER SHALL CERTIFY THAT TYPE A (CLEAR) MYLAR OR EQUIVALENT WAS USED TO FABRICATE SHIPMENT.
   - D. THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.
3. DESIGN:
   - B. TEMPERATURE RANGE: -55° TO +130°C.
   - C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F, OR 2 HOURS AT +275°F, OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.
   - D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I.
     - 1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @.300 ± 010 FROM EACH EDGE.
   - E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.
     - (1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.
   - F. CHARACTERISTICS: (TYPICAL)
     - (1) [illegible]
     - (2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.
     - (5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.
     - (6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.
     - (7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50. 25 OUNCES PER INCH WIDTH, CONDITION E-2/130.
     - (8) BOND SEPARATION AFTER CURE: 30 MINUTES.
     - (9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)
     - (10) ELONGATION: 55 PERCENT, MAXIMUM.
     - (11) LENGTH PER ROLL: 36 YDS.

TABLE I

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-1	0.800 ± .002	DOUBLE	DOUBLE	.0066 .0056	YELLOW
-2	1.400 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-3	0.600 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-4	0.500 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-5	0.700 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-6	0.188 ± .002	DOUBLE	DOUBLE	.0066 .0056	"
-7	0.500 ± .005	SINGLE	NONE	.004 .002	"
-8	0.700 ± .005	SINGLE	NONE	.004 .002	"
-9	0.800 ± .005	SINGLE	NONE	.004 .002	"
-10	0.900 ± .005	DOUBLE	DOUBLE	.0066/.0056	"
-11	0.800 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-12	1.400 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-13	.500 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-14	0.700 ± .002	DOUBLE	DOUBLE	.0076/.0066	"
-15	0.700 ± .005	SINGLE	NONE	.005/.003	"
-16	0.600 ± .005	SINGLE	SINGLE	.021/.011	"
-17	0.218 ± .002	SINGLE	NONE	.004/.002	"
-18	0.218 ± .002	DOUBLE	DOUBLE	.0045/.0035	"
-19	.060±.002	SINGLE	NONE	.003/.005	"
-20	.334±.002	SINGLE	NONE	.003/.005	"
-21	.502±.002	SINGLE	NONE	.003/.005	"

SEE NOTE 3.D.1.

TABLE I CONTINUED

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-22	.295±.002	SINGLE	NONE	.003/.005	YELLOW
-23	.087±.002	SINGLE	NONE	.003/.005	YELLOW
-24	0.400±.005	SINGLE	NONE	.005/.003	YELLOW
-25	0.600±.005	TRIPLE	SINGLE	.021/.011	YELLOW
-26	.188±.010	SINGLE	SINGLE	.005/.003	YELLOW
-27	0.580 ±.002	DOUBLE	DOUBLE	.0066 /.0056	YELLOW
-28	0.480 ±.002	DOUBLE	DOUBLE	.0066/.0056	YELLOW

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Y[illegible] DATE 16 APR 63
CHECKED A. Maynard 16 APR 63
APPROVAL W. [illegible] Turner 30 APR 63
APPROVAL
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

R | 9089001

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REQUIREMENTS:

1. GENERAL:

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   D. THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.

3. DESIGN:

   B. TEMPERATURE RANGE: -55° TO +130°C.

   C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F., OR 2 HOURS AT +275°F., OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.

   D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK SEE TABLE I.

      1. LINER FOR DASH NO-2 SHALL BE SPLIT LENGTHWISE IN 2 PLACES, EACH SIDE @.300 ± .010 FROM EACH EDGE.

   E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.

      (1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.

   F. CHARACTERISTICS: (TYPICAL)

      (1) [illegible] SEE TABLE I

      (2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.

      (3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.

      (4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.

      (5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.

      (6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.

      (7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
      25 OUNCES PER INCH WIDTH, CONDITION E-2/130.

      (8) BOND SEPARATION AFTER CURE: 30 MINUTES.

      (9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)

      (10) ELONGATION: 55 PERCENT, MAXIMUM.

      (11) LENGTH PER ROLL: 36 YDS.

TABLE I CONTINUED

PHYSICAL PROPERTIES

DASH NO.	WIDTH	COATING	LINER	THICKNESS	ADHESIVE COLOR
-22	.295±.002	SINGLE	NONE	.003/.005	YELLOW
-23	.087±.002	SINGLE	NONE	.003/.005	YELLOW
-24	0.400±.005	SINGLE	NONE	.005/.003	YELLOW
-25	0.600±.005	TRIPLE	SINGLE	.021/.011	YELLOW
-26	.188±.010	SINGLE	SINGLE	.005/.003	YELLOW
-27	0.580 ±.002	DOUBLE	DOUBLE	.0066 /.0056	YELLOW
-28	0.480 ±.002	DOUBLE	DOUBLE	.0066/.0056	YELLOW
-29	0.218 ±.002	SINGLE	NONE	.0027/.0020	YELLOW
-30	0.448 ±.005	SINGLE	NONE	.006/.004	YELLOW
-31	0.448 ±.005	DOUBLE	SINGLE	.007/.005	YELLOW

REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02393	8/7/63	JJM
B	REVISED PER TDRR 02620	8/14/63	WK
C	REVISED PER TDRR 02813	8/28/63	[illegible]
D	REVISED PER TDRR 03512	30Oct63	WK
E	REVISED PER TDRR 04001	17Dec63	WK
F	REVISED PER TDRR 04182	10/30/63	WK
G	REVISED PER TDRR 06955	3/17/64	WK
H	REVISED PER TDRR 10115	6/16/64	[illegible]
J	REVISED PER TDRR 16805	3/2/65	WK
K	REVISED PER TDRR 17477	3-23-65	WK
L	REVISED PER TDRR 18240	4/27/65	WK
M	REVISED PER TDRR 18627	5/24/65	WK
N	REVISED PER TDRR 21413	8/24/65	WK
P	REVISED PER TDRR 22436	9/26/65	WK
R	REVISED PER TDRR 23171	11/5/65	WK

SEE NOTE 3.D.1.

TABLE I

PHYSICAL PROPERTIES

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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL SEE NOTES	DRAWN A. Yehong DATE 16 APR 63 CHECKED A. Maynard 16 APR 63 APPROVAL W. B. Turner 30 APR 63 APPROVAL	INSULATION TAPE, ELECTRICAL THERMOSETTING ADHESIVE SPECIFICATION CONTROL DRAWING
		HEAT TREATMENT NONE FINAL FINISH NONE	NASA APPROVAL W J Rhine 5-1-63 MIT APPROVAL	CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006806 SCALE NONE WT SHEET 1 OF 1

S 9089001

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S	REVISED PER TDRR 23876	11/23/65	WK

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D. THICKNESS, WITH ADHESIVE, LESS LINER: SEE TABLE I, CONDITION C-96/23/50.

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TABLE I

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TABLE I CONTINUED

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MASTER

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FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 16 APR 63
CHECKED Maynard 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL 1 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

9089001 (M)

REVISIONS TDRR 01101

SYM	DESCRIPTION	DATE	APPROVAL
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   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - D. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.
   - E. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. PHYSICAL PROPERTIES: PER TABLE I.
   - B. MARKING: PER PARAGRAPH 1 E.
3. DESIGN:
   - A. TAPE SHALL BE A DOUBLE COATED, THERMOSETTING, PRESSURE SENSITIVE, ADHESIVE WITH A DOUBLE LINER.
   - B. TEMPERATURE RANGE: -55° TO +130°C.
   - C. CURING REQUIREMENTS; RECOMMENDED: 3 HOURS AT +250°F., OR 2 HOURS AT +275°F., OR 1 HOUR AT +300°F, OR 24 HOURS IN AIR.
   - D. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.
   - E. STORAGE LIFE: 2 YEARS FROM THE DATE OF ORIGINAL MANUFACTURE WHEN STORED AT +25°C UNDER AMBIENT ROOM CONDITIONS.
     - (1) EXPIRATION DATE: SHALL BE SPECIFIED AND DETERMINED FROM THE STORAGE LIFE.
   - F. CHARACTERISTICS:
     - (1) THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ± 0.0005, CONDITION C-96/23/50.
     - (2) TENSILE STRENGTH: 16 POUNDS MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (3) ADHESION TO STEEL: 38 OUNCES MIN PER INCH WIDTH, CONDITION C-96/23/50.
     - (4) INDIRECT ELECTROLYTIC CORROSION: 1 X 10^{-12} MHOS, CONDITION C-18/23/96.
     - (5) DIELECTRIC BREAKDOWN: 4500 VOLTS RMS, CONDITION C-96/23/96.
     - (6) INSULATION RESISTANCE: 1 X 10^{6} MEGOHMS, MINIMUM AT 500 VOLTS DC, CONDITION C-96/23/96.
     - (7) ADHESION TO BACKING: 8 OUNCES PER INCH WIDTH, CONDITION C-96/23/50.
25 OUNCES PER INCH WIDTH, CONDITION E-2/130.
     - (8) BOND SEPARATION AFTER CURE: 30 MINUTES.
     - (9) RESISTANCE TO PENETRATION AT ELEVATED TEMPERATURES: +200°C. (AS DEFINED PER MIL-I-15126)
     - (10) ELONGATION: 55 PERCENT, MAXIMUM.

TABLE I

PHYSICAL PROPERTIES		
DASH NUMBER	WIDTH	LENGTH PER ROLL
-1	0.800 ± .002	36 YDS
-2	1.400 ± .002	36 YDS
-3	.600 ± .002	36 YDS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 16 APR 63
CHECKED A. Maynard 16 APR 63
APPROVAL W. B. Turner 30 APR 63
APPROVAL
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE, DOUBLE COATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006806
SCALE NONE
WT
SHEET 1 OF 1

1006806

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

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1006807 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 01561		

REQUIREMENTS:

1. GENERAL:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
    - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
    - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002052.
    - E. MARKING: THE UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND CONTACT IDENTIFICATION.
2. ACCEPTANCE AND INSPECTION:
    - A. MECHANICAL PROPERTIES:
        - (1) DIELECTRIC: DIALLYL PHTHALATE, GLASS REINFORCED, LONG FIBRES, FLAME RETARDED IN ACCORDANCE WITH MIL-M-19833.
        - (2) CONTACTS: PIN, BRASS, GOLD PLATE 0.000030 INCH OVER 0.000020 SILVER PLATE.
        - (3) GUIDE PINS AND GUIDE SOCKETS: CORROSION RESISTING STEEL, PASSIVATED.
        - (4) INSERTS: CORROSION RESISTING STEEL, TYPE 303, PASSIVATED.
        - (5) CREEPAGE PATH: BETWEEN CONTACTS-0.110 INCH, MINIMUM.
    - B. ELECTRICAL PROPERTIES:
        - (1) VOLTAGE RATING: SEA LEVEL -1.8 K VRMS -2.5 K VDC
          60,000 FEET ALTITUDE -500 VRMS -700 VDC
        - (2) CURRENT RATING: 10 AMPERES CONTINUOUS, 13 AMPERES MAX.
        - (3) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00738 DATE 3 Apr 63

A	A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 25 Mar 63
CHECKED H. Maynard 26 MAR 63
APPROVAL 2 April 63
APPROVAL
NASA APPROVAL
MIT APPROVAL 3 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
	C	1006807	
SCALE NONE	WT		SHEET 1 OF 2

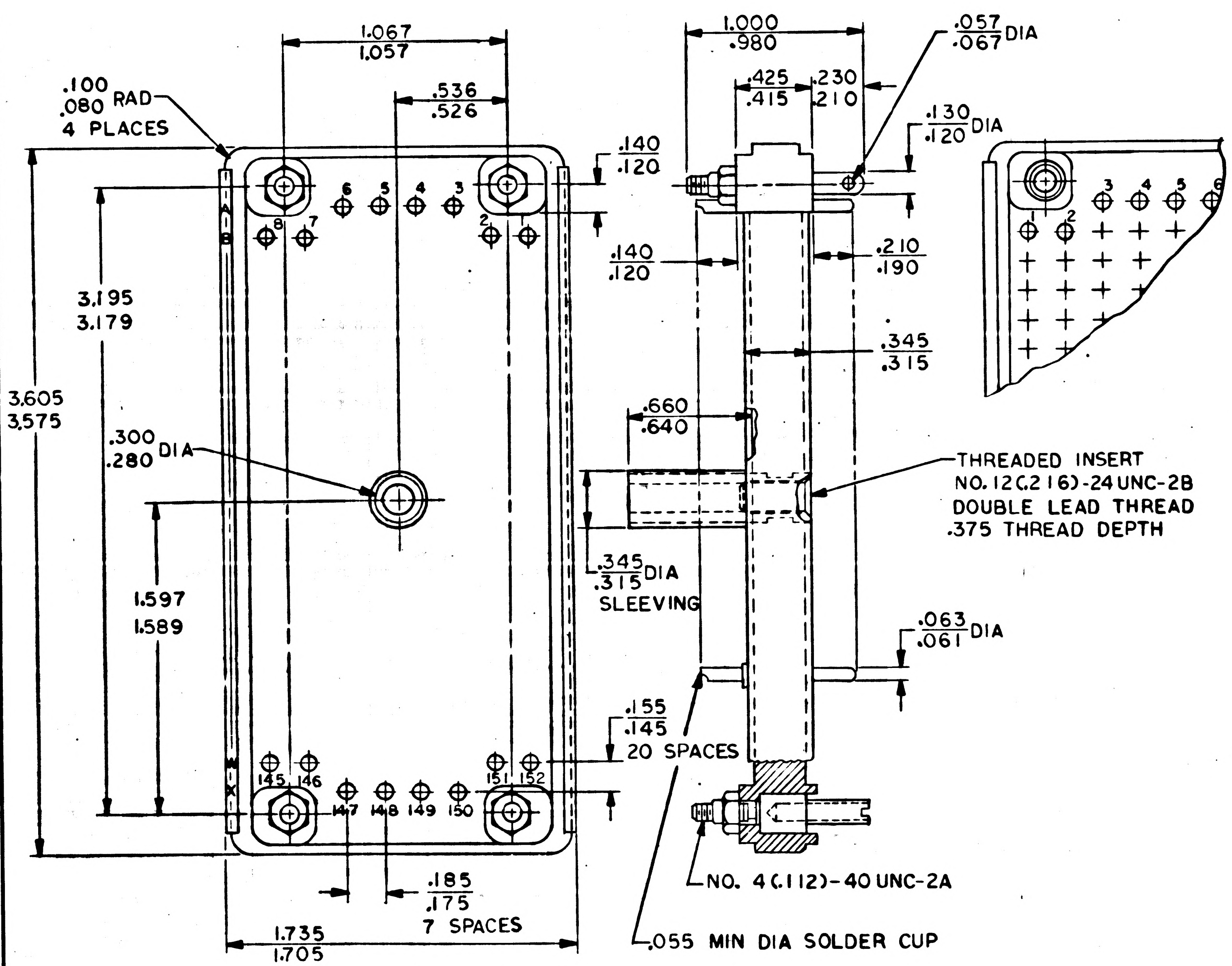
4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006807 A Ⓜ

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	.REVISED PER TDRR 01561	12 Jun 63	P.K.B.



.100 .080 RAD 4 PLACES
1.067 1.057
.536 .526
3.195 3.179
3.605 3.575
.300 .280 DIA
1.597 1.589
1.735 1.705
.185 .175 7 SPACES
1 2 3 4 5 6 7 8
145 146 147 148 149 150 151 152
A B W X
1.000 .980
.425 .415
.230 .210
.057 .067 DIA
.130 .120 DIA
.140 .120
.140 .120
.210 .190
.345 .315
.660 .640
THREADED INSERT NO. 12(.216)-24 UNC-2B DOUBLE LEAD THREAD .375 THREAD DEPTH
.345 .315 DIA SLEEVING
.063 .061 DIA
.155 .145 20 SPACES
NO. 4(.112)-40 UNC-2A
.055 MIN DIA SOLDER CUP

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00738 DATE 3 Apr 63

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Wheeler DATE 25 Mar 63
CHECKED G. Pember H.M. 26 MAR 63
APPROVAL E.T. Driscoll 2 April 63
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL 3 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006807
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006807

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002052.
   - E. MARKING: THE UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND CONTACT IDENTIFICATION.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIELECTRIC: DIALLYL PHTHALATE, GLASS REINFORCED, LONG FIBRES, FLAME RETARDED IN ACCORDANCE WITH MIL-M-19833.
     - (2) CONTACTS: PIN, BRASS, GOLD PLATE 0.000030 INCH OVER 0.000020 SILVER PLATE.
     - (3) GUIDE PINS AND GUIDE SOCKETS: CORROSION RESISTING STEEL, PASSIVATED.
     - (4) INSERTS: CORROSION RESISTING STEEL, TYPE 303, PASSIVATED.
     - (5) CREEPAGE PATH: BETWEEN CONTACTS-0.110 INCH, MINIMUM.
   - B. ELECTRICAL PROPERTIES:
     - (1) VOLTAGE RATING: SEA LEVEL -1.8 K VRMS -2.5 K VDC
       60,000 FEET ALTITUDE -500 VRMS -700 VDC
     - (2) CURRENT RATING: 10 AMPERES CONTINUOUS, 13 AMPERES MAX.
     - (3) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00738 DATE 3 Apr 63

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Wheeler JW DATE 25 Mar 63
CHECKED A. Maynard 26 MAR 63
APPROVAL E T Duncan 2 April 63
APPROVAL
NASA APPROVAL
MIT APPROVAL W Kupfer 3 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006807
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006807

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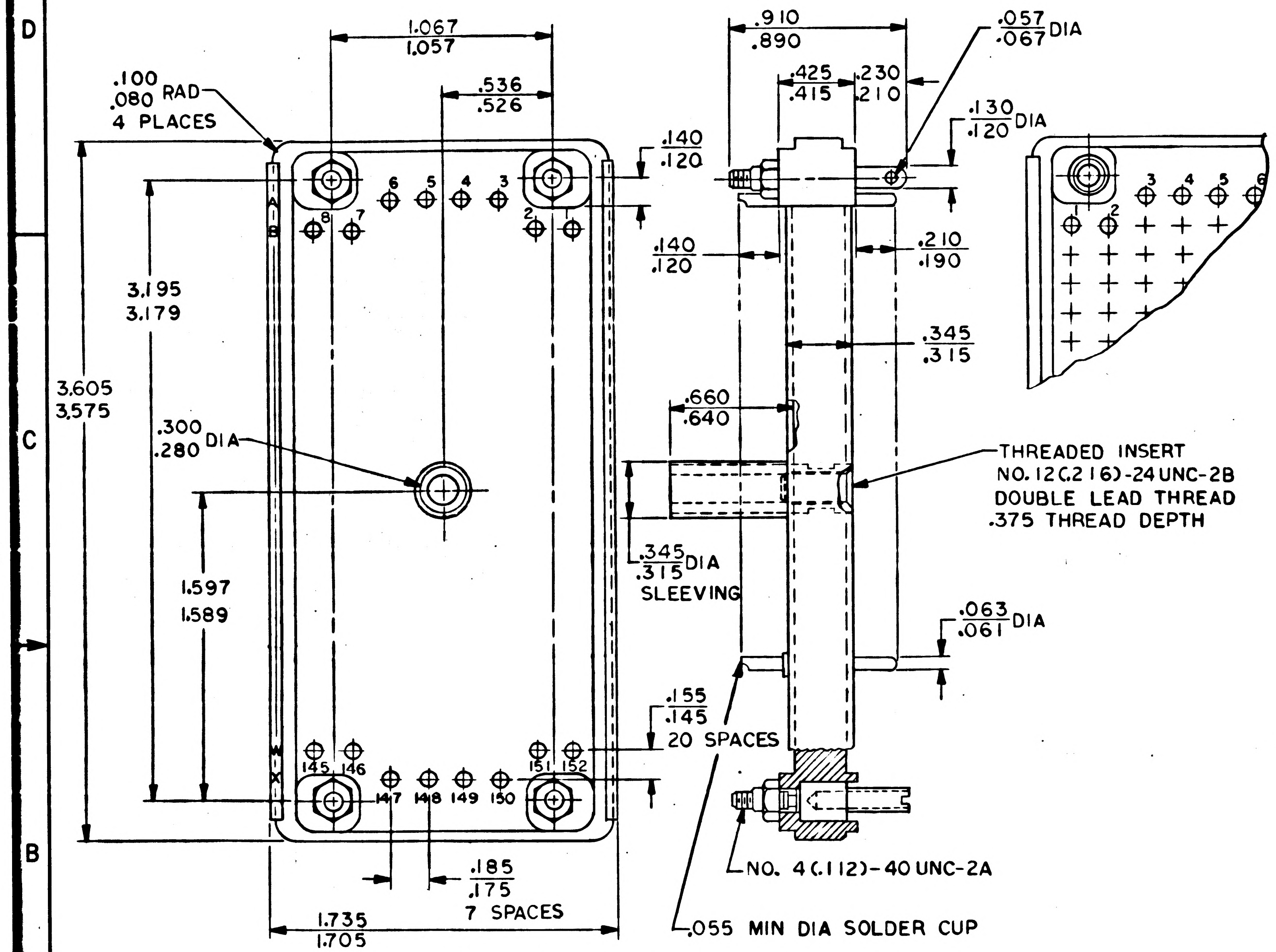
1006807

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



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.080 RAD
4 PLACES
1.067
1.057
.536
.526
.140
.120
A
B
8
7
6
5
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3
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3.179
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3.575
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W
X
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20 SPACES
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7 SPACES
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.130
.120 DIA
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.120
.210
.190
.345
.315
.660
.640
THREADED INSERT
NO. 12(.216)-24 UNC-2B
DOUBLE LEAD THREAD
.375 THREAD DEPTH
.345
.315 DIA
SLEEVING
.063
.061 DIA
NO. 4(.112)-40 UNC-2A
.055 MIN DIA SOLDER CUP

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00738 DATE 3Apr63

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Wheeler DATE 25 Mar 63
CHECKED A. Pember 26 MAR63
APPROVAL E Y Driscoll 2 April 63
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL 3 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE
152 CONTACTS (MALE)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006807
SCALE NONE WT SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006807

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1006813 A

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION (100%):

   A. MECHANICAL PROPERTIES:

      (1) LEAD MATERIAL: BRASS, TIN PLATED.

      (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

      (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).

   B. ELECTRICAL CHARACTERISTICS:

      (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE

      (2) POWER FACTOR: 0.25 MAXIMUM.

      (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

      (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.

   B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO 55°C.

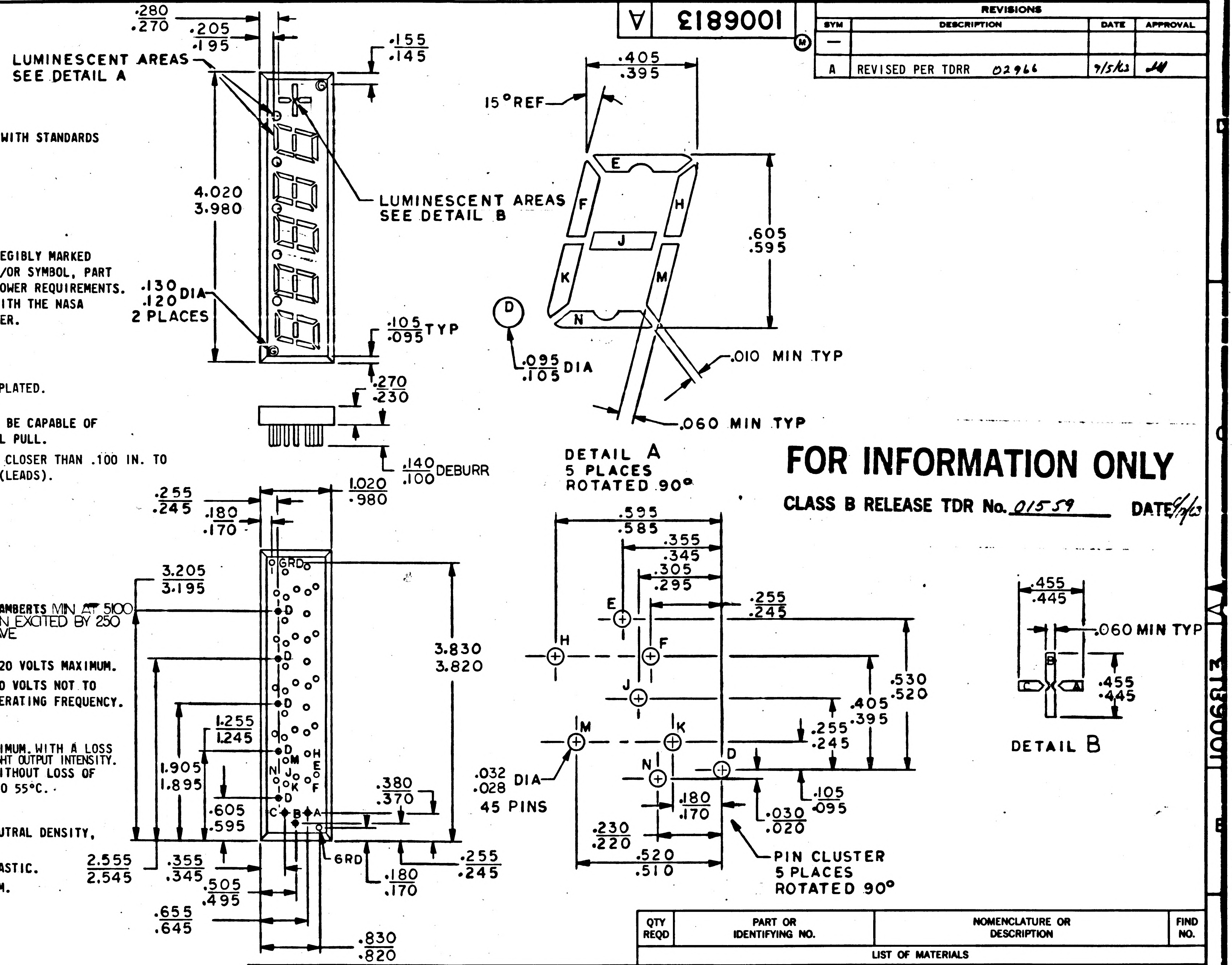
   C. CONSTRUCTION:

      (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.

      (2) INSULATION BOARD: XXXP PLASTIC.

      (3) PROTECTIVE FRAME: ALUMINUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.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LUMINESCENT AREAS SEE DETAIL A
LUMINESCENT AREAS SEE DETAIL B
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.130
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2 PLACES
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.100 DEBURR
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.245
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.170
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.980
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3.195
3.830
3.820
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.820
.180
.170
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.245
GRD
6RD
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.395
15° REF
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.605
.595
.095
.105 DIA
.010 MIN TYP
.060 MIN TYP
DETAIL A
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.305
.295
.255
.245
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.105
.095
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.170
.030
.020
.230
.220
.520
.510
PIN CLUSTER
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ROTATED 90°
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.455
.445
DETAIL B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02966	9/5/63	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE 6/7/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. Crespi DATE 15 May 63
CHECKED J. [illegible] / H. [illegible] 21 MAY 63
APPROVAL [illegible] 6/4/63
APPROVAL Eldon C Hall 10 June 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—
ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006813
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1006813

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02966	9/5/63	
B	REVISED PER TDRR 04185	10/24/63	

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION (100%):

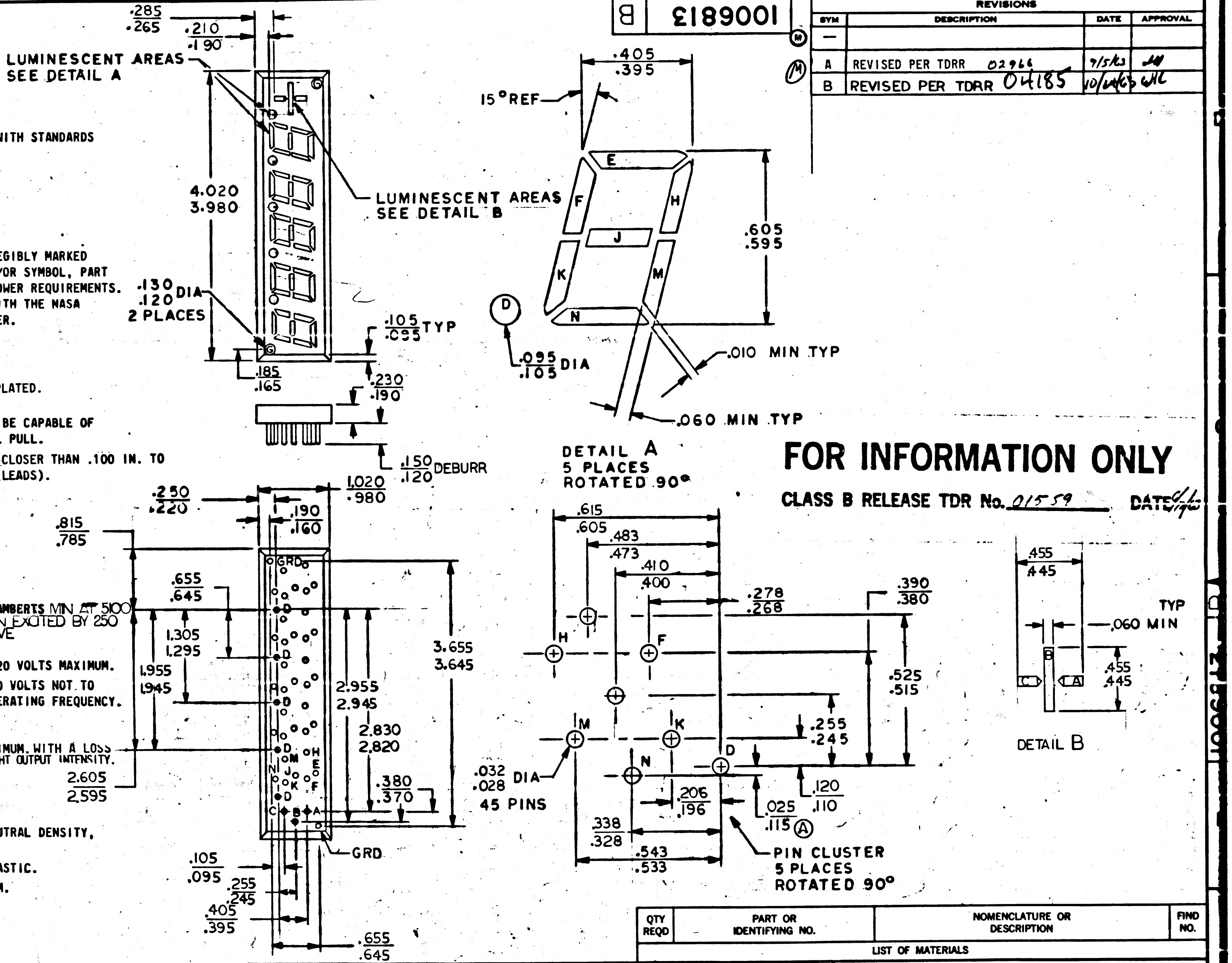
   A. MECHANICAL PROPERTIES:
      (1) LEAD MATERIAL: BRASS, TIN PLATED.
      (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
      (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).

   B. ELECTRICAL CHARACTERISTICS:
      (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN ~~AT~~ 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
      (2) POWER FACTOR: 0.25 MAXIMUM.
      (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
      (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.

   B. CONSTRUCTION:
      (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
      (2) INSULATION BOARD: XXXP PLASTIC.
      (3) PROTECTIVE FRAME: ALUMINUM.



LUMINESCENT AREAS SEE DETAIL A
LUMINESCENT AREAS SEE DETAIL B
.285 / .265
.210 / .190
4.020 / 3.980
.130 / .120 DIA 2 PLACES
.105 / .095 TYP
.185 / .165
.230 / .190
.150 / .120 DEBURR
.250 / .220
.190 / .160
1.020 / .980
.815 / .785
.655 / .645
1.305 / 1.295
1.955 / 1.945
2.955 / 2.945
2.830 / 2.820
3.655 / 3.645
.380 / .370
2.605 / 2.595
.105 / .095
.255 / .245
.405 / .395
.655 / .645
GRD
H E F J K M N D C B A
.032 / .028 DIA 45 PINS
15° REF
.405 / .395
E F H J K M N
.605 / .595
D
.095 / .105 DIA
.010 MIN TYP
.060 MIN TYP
DETAIL A 5 PLACES ROTATED 90°
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.410 / .400
.278 / .268
.390 / .380
.525 / .515
.255 / .245
.120 / .110
.025 / .115 Ⓐ
.206 / .196
.338 / .328
.543 / .533
PIN CLUSTER 5 PLACES ROTATED 90°
.455 / .445
TYP
.060 MIN
.455 / .445
C B A
DETAIL B

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 15 May 63
CHECKED J. [illegible] / H. [illegible] 21 May 63
APPROVAL [illegible] 6/4/63
APPROVAL Eldon C Hall 12 June 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—
ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006813
SCALE NONE
WT
SHEET 1 OF 1

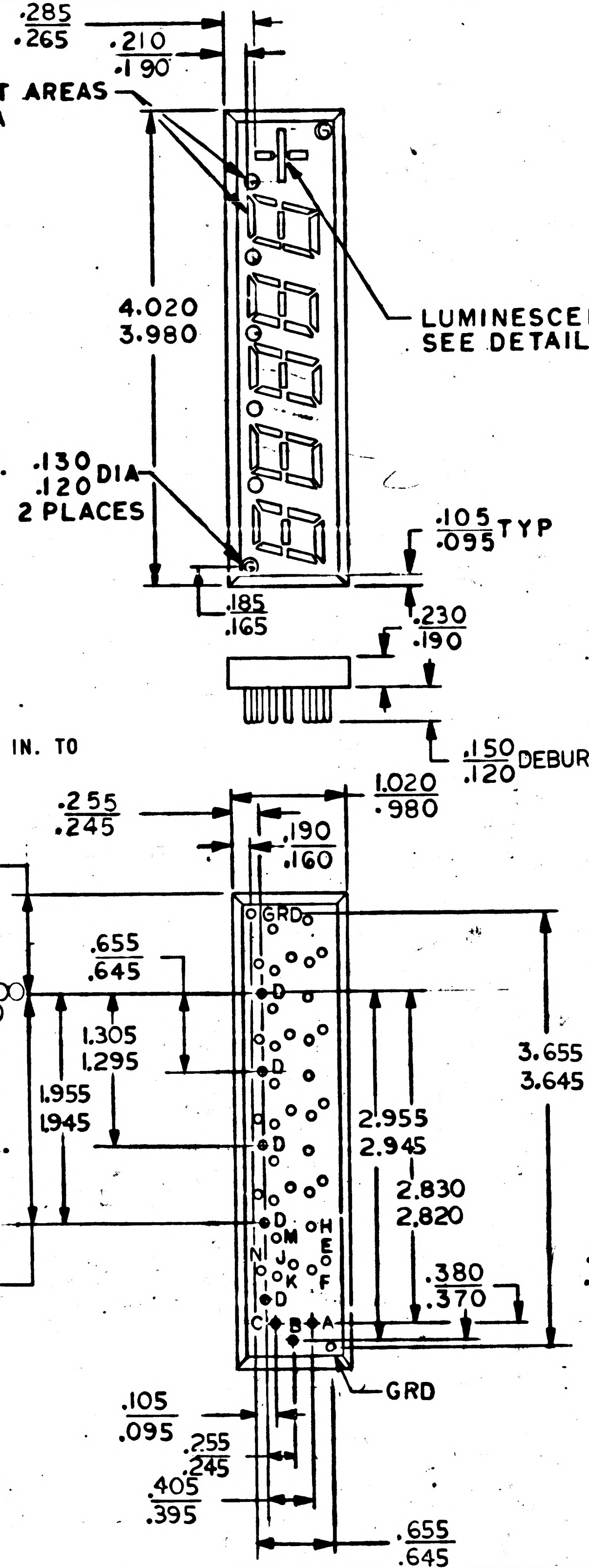
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.


LUMINESCENT AREAS SEE DETAIL A
LUMINESCENT AREAS SEE DETAIL B
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4.020 3.980
.130 .120 DIA 2 PLACES
.105 .095 TYP
.185 .165
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.150 .120 DEBURR
.255 .245
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1.955 1.945
3.655 3.645
2.955 2.945
2.830 2.820
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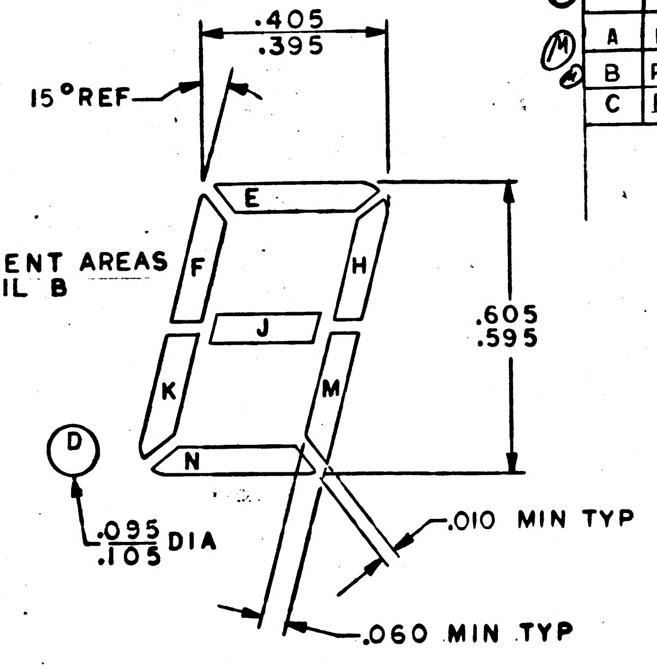
.405 .395
15° REF
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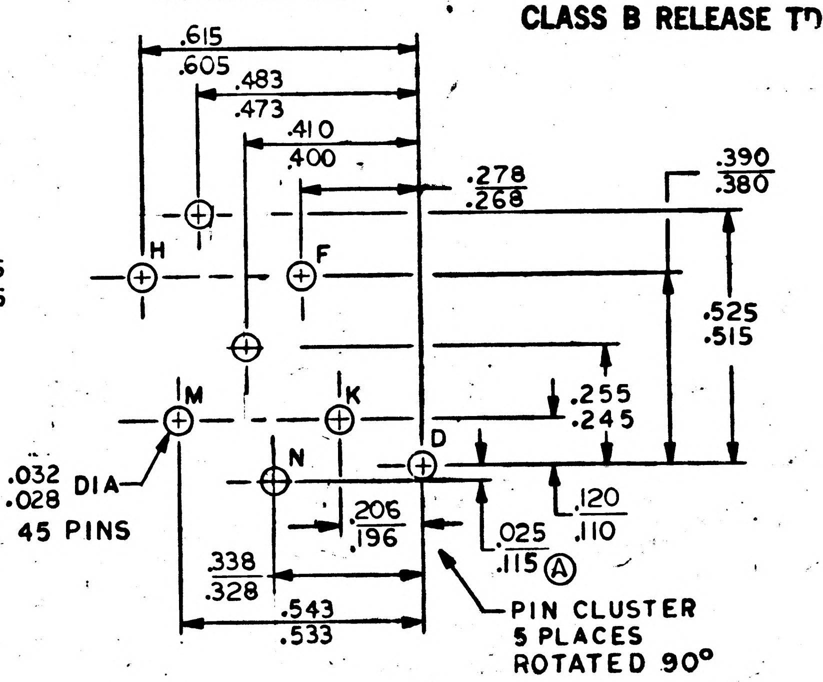
.060 MIN TYP

DETAIL A
5 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 **DATE** 6/7/63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45 PINS
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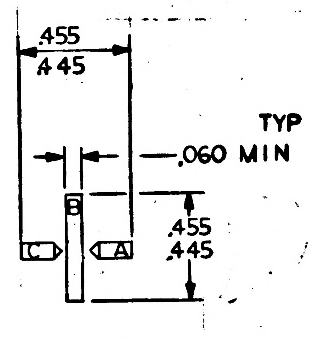
PIN CLUSTER 5 PLACES ROTATED 90°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TYP
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DETAIL B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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A	REVISED PER TDRR 02966	9/5/63	
B	REVISED PER TDRR 04185	10/4/63	WHL
C	REVISED PER TDRR 04402	5 Nov 63	WH.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 15 May 63
CHECKED J. Ruggieri / H. Maynard 21 May 63
APPROVAL 6/4/63
APPROVAL Eldon C Hall 11 June 63
NASA APPROVAL Jack Bassard
MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006813
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1006813

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—			

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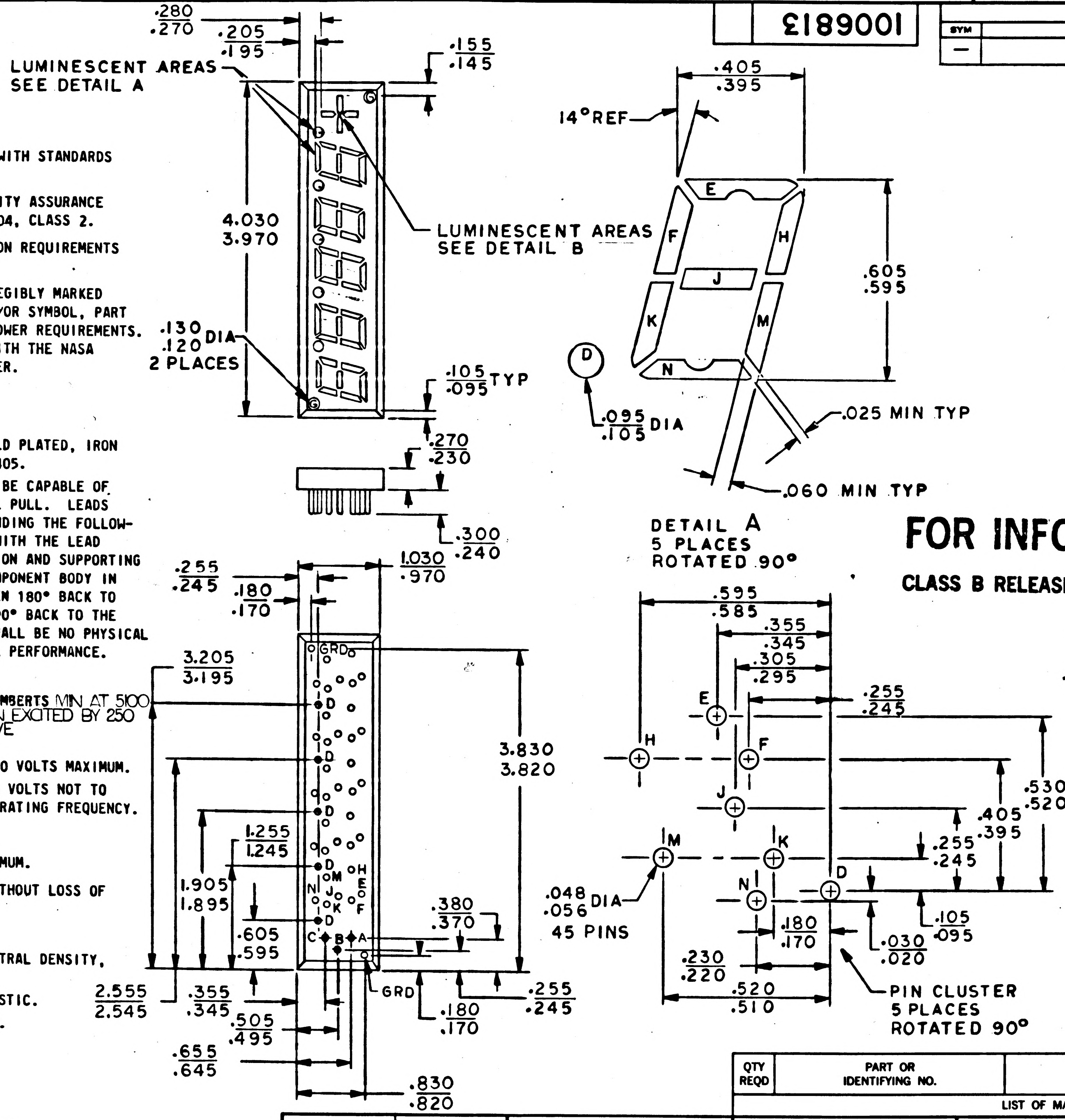
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.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LUMINESCENT AREAS
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3.970
LUMINESCENT AREAS
SEE DETAIL B
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DETAIL A
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.030
.020
.230
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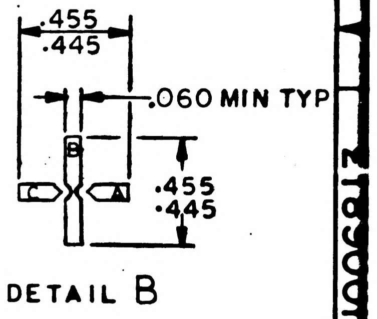
PIN CLUSTER
5 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE 6/17/63


.455
.445
.060 MIN TYP
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C
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.455
.445

DETAIL B

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. Crespi DMS DATE 15 May 63
CHECKED J. [illegible] / H Maynard 21 MAY 63
APPROVAL [illegible] 6/4/63
APPROVAL Eldon C Hall 11 June 63

NASA APPROVAL Jack Bassant

MIT APPROVAL Percy K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006813
SCALE NONE
WT
SHEET 1 OF 1

1006813

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006814 | B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR · 02966	9/5/63	
B	REVISED PER TDRR 04186	10/24/63	

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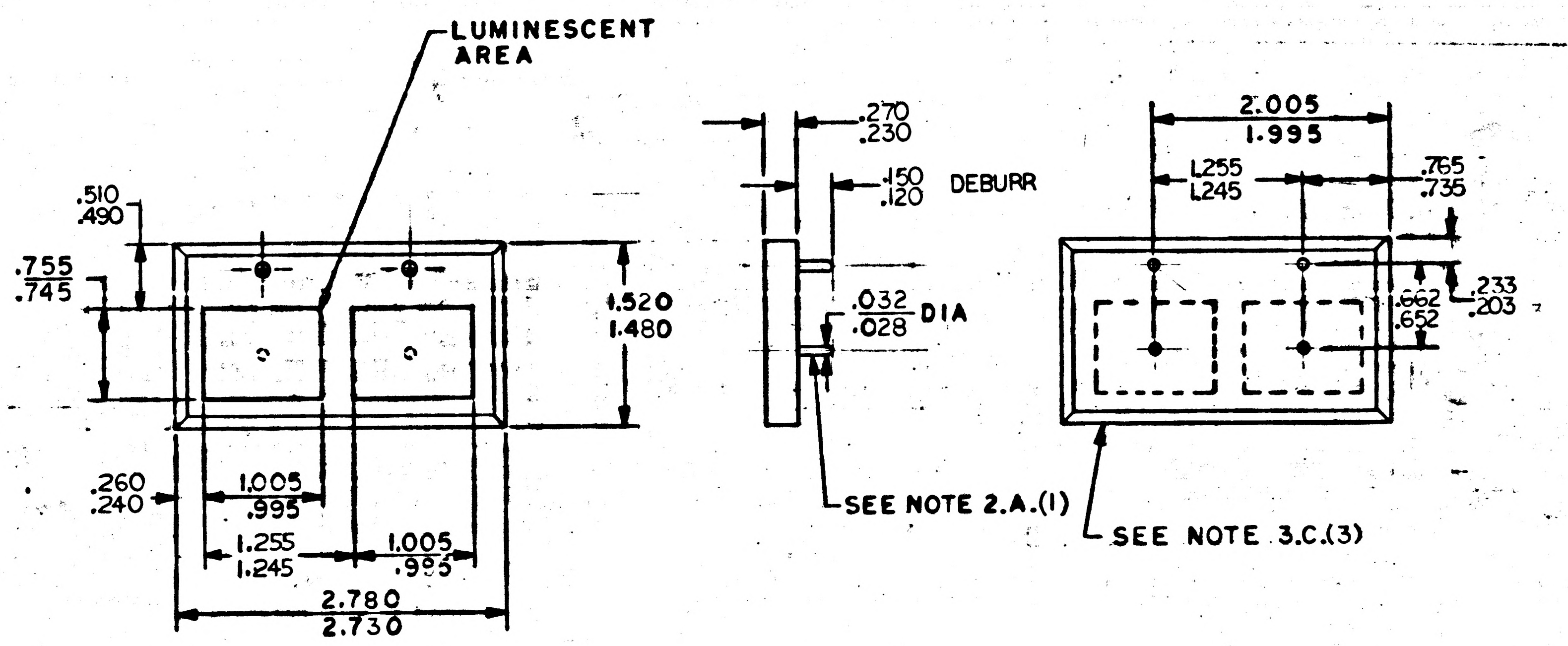
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE 7/17/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE [illegible]
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT
DRAWN C. Crespi DATE 13 May 63
CHECKED J. Ryan / H. Maynard 21 MAY 63
APPROVAL 6/11/63
APPROVAL Ellen C Hall 12 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL Perry K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—
ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006814

SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006814 C

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02966	9/5/63	
B	REVISED PER TDRR 04186		
C	REVISED PER TDRR 07102		

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FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER PER MIL-STD-129.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY. [illegible]0 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY
   - B. STORAGE LIFE: 1 YEAR MIN[illegible] WITHOUT LOSS OF ELECTRICAL PERFORMANCE
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
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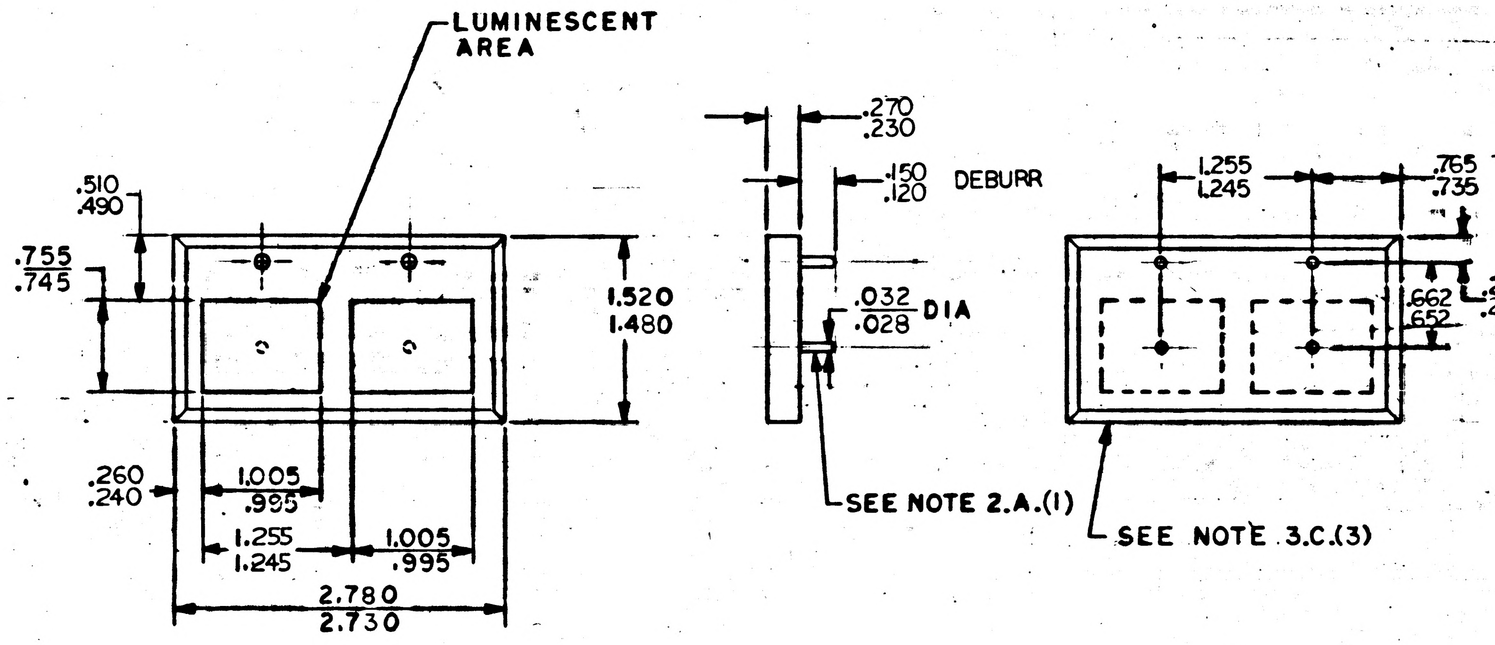

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

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LIST OF MATERIALS

NEXT ASSY	USED ON
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DO NOT SCALE THIS DRAWING
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HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 13 May 63
CHECKED 21 May 63
APPROVAL 6/11/63
APPROVAL Eldon C Hall 12 June 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY- ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006814
SCALE NONE WT SHEET 1 OF 1

INCHES
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PHOTOGRAPHIC SCALE ONLY

1006814

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			

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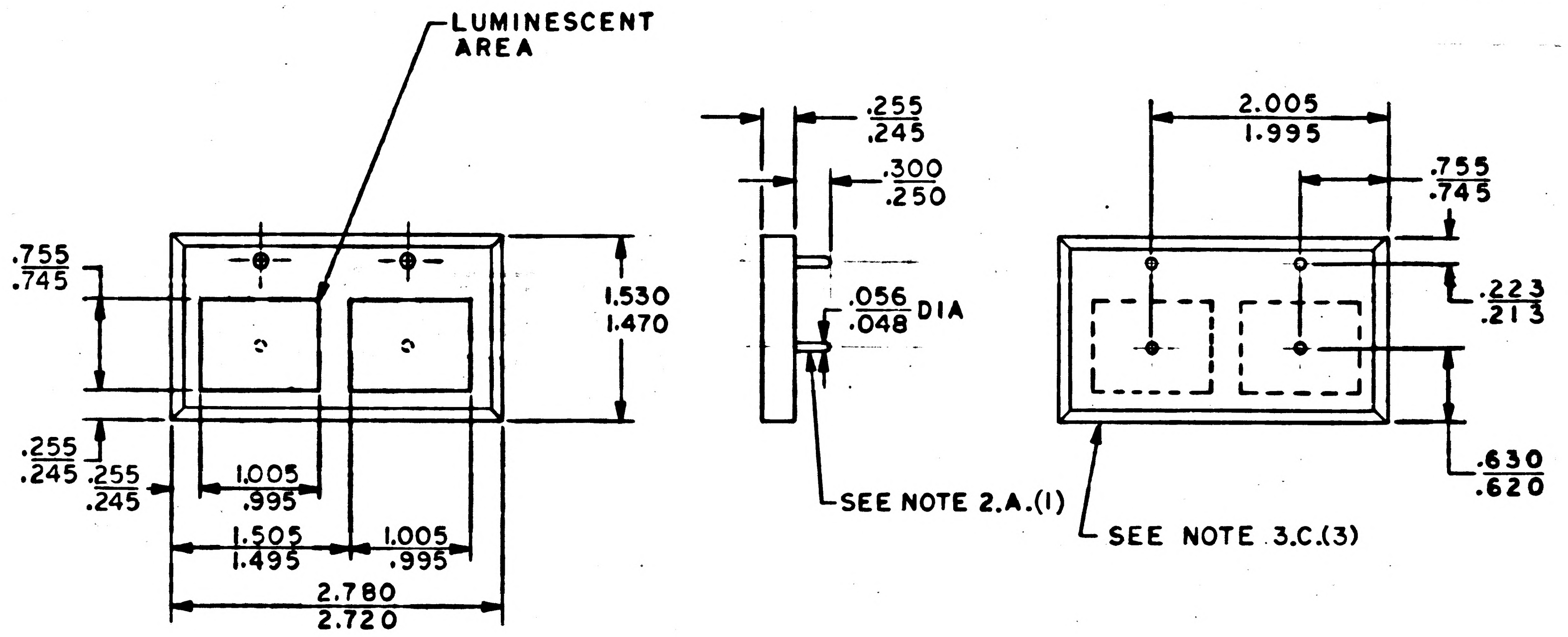
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE 6/12/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 13 May 63
CHECKED 21 May 63
APPROVAL 6/11/63
APPROVAL Ellen C Hall 12 Jun 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY-
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006814
SCALE NONE WT SHEET 1 OF 1

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1006815 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	RELEASE CLASS A PER TDRR 02953	24 APR 63	WR
A	REPLACED BY REV B WITH CHANGES PER TDRR 02965	5 Aug 63	WR

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404 CLASS 2.

C. UNITS SHALL MEET ALL APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH QUALIFICATIONS AS NOTED BELOW.

2. INSPECTION & ACCEPTANCE:

A. MECHANICAL REQUIREMENTS

1. LEADS: UNITS SHALL HAVE WELDABLE KOVAR LEADS PER ND PS1015402 EXCEPT LEAD DIAMETER WHICH SHALL BE PER FIGURE. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

2. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC BIAS.

3. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS AND GOLD PLATED SILVER CONTACTS.

4. SEAL: HERMETICALLY SEALED. (SEAL TEST III)

5. LEAD PULL: 3.0 POUNDS MIN.

6. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINAL ONE.

B. ELECTRICAL REQUIREMENTS

1. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.

2. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.

3. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.

4. COIL PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.

5. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.

6. CONTACT CURRENT RATING: 2 AMPERES MAX AT 28 VDC OR 120 VAC OPEN CIRCUIT WITH RESISTIVE LOAD.

7. CONTACT RESISTANCE: 1 OHM MAX AT 1 ma.

8. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.

9. TIME, TRANSFER: 1 MILLISECOND MAX.

10. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.

11. TIME, CONTACT CHATTER: 10 us MAX WHEN TESTED PER PARAGRAPH 3.B.4 OR 3.B.5.

ELECTRICAL REQUIREMENTS (CONT'D)

12. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC MIN FOR 5 SECONDS MIN BETWEEN OPEN CONTACTS.

13. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

14. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN—
(a) MUTUALL INSULATED TERMINALS
(b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
(c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
(d) CONTACTS AND FRAME

3. DESIGN REQUIREMENTS:

A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE OPERATING TEMPERATURE RANGE AND FOR ALL CURRENTS UP TO RATED CONTACT CURRENT.

4. SPECIAL CONDITIONING: (BY MANUFACTURER)

A. BURN IN: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE LOAD CURRENT OF 20 ua MAX AT 20 MV DC. THERE SHALL BE NO OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 1000 OHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.

FOLLOWING BURN IN, RELAYS SHALL BE TESTED AND SHALL MEET THE REQUIREMENTS OF NOTE 2,B,6,7,8,9 & 10.

Ⓐ REPLACED BY REV B WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

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DWG. NO. CONTRACT
DRAWN DATE 23-4-63
CHECKED 4/24/63
APPROVAL 4/24/63
APPROVAL
NASA APPROVAL 4/24/63
MIT APPROVAL 24Apr63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ELECTROMAGNETIC, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006815
SCALE —
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SHEET 1 OF 2

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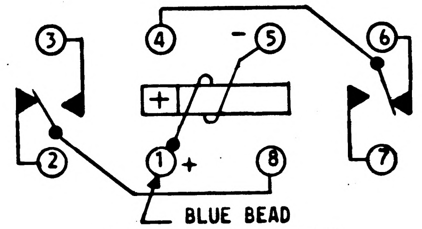
1006815 A

SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS A RELEASE PER TDRR 00953	24Apr63	WK
A	REPLACED BY REV B WITH CHANGES PER TDRR 02965	5Sep63	WK

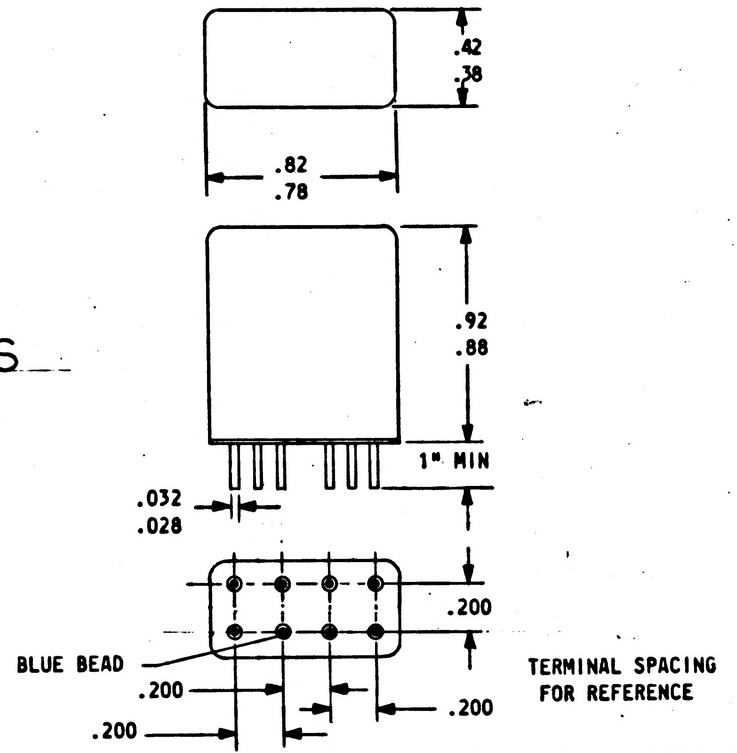
Ⓜ

DASH NO.	COIL RES OHMS(±10%)	PULL-IN MADC(MAX)	DROP-OUT MADC(MIN)	MAX CONT. CURRENT MADC AT 125°C
-1	490	14.5	2.0	23
-2	770	11.2	1.5	18

Ⓐ REPLACED BY REV B WITH CHANGES



ELECTRICAL SCHEMATIC
DE-ENERGIZED



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
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DWG. NO.
CONTRACT

DRAWN Louis A Lowe DATE 23-4-63
CHECKED 4/24/63
APPROVAL 4/24/63
APPROVAL
NASA APPROVAL 4/24/63
MIT APPROVAL 24 Apr 63

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RELAY, ELECTROMAGNETIC, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006815
SCALE —
WT
SHEET 2 OF 2

MASTER

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PHOTOGRAPHIC SCALE ONLY

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B 1006815

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965		

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

2. ACCEPTANCE AND INSPECTION:

   A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

   B. MECHANICAL REQUIREMENTS:

      (1) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (2) MARKING:

         (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:

            NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
            DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
            DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE MUST OPERATE CURRENT, MAXIMUM.
            SCHEMATIC DIAGRAM.
            BLUE BEADING AROUND TERMINALS 1.

         (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.

      (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN.

      (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

   C. ELECTRICAL REQUIREMENTS:

      (1) COIL CURRENT: PULL-IN AND DROP-OUT IN ACCORDANCE WITH TABLE I.

      (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

      (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

      (4) DIELECTRIC STRENGTH:

         (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.

      (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

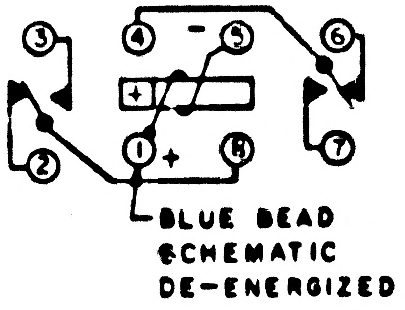
      (6) OPERATE AND RELEASE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.

      (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

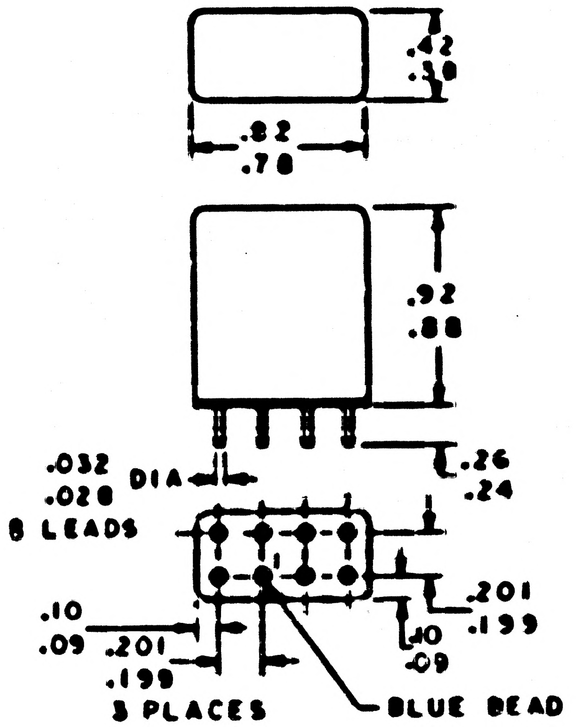
      (8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.

      (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



BLUE BEAD
SCHEMATIC
DE-ENERGIZED



Ⓑ REPLACES REV(A) WITH CHANGES

B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
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RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO | SIZE C | NASA DRAWING NO 1006815
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PHOTOGRAPHIC SCALE ONLY

B 1006815

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965		

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 1.5 WATTS MAXIMUM AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL IN POWER (SENSITIVITY) IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE) DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC BIAS.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CONTACT RESISTANCE AND MAXIMUM PULL-IN CURRENT, SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5,000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1, 3, 6, 7, 8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RESISTANCE OHMS @ 25°C MIN - MAX	PULL-IN CURRENT MADC MAX POSITIVE	CONTINUOUS CURRENT @ 125°C MADC MAX	SUGGESTED SOURCE VOLTAGE VDC	OPERATE SENSITIVITY MW NOM.	DROP-OUT CURRENT MADC MIN POSITIVE
-1	539 - 441	14.5	23	12.5	100	2.0
-2	720 - 880	11.2	18	16	100	1.5

Ⓑ REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	ITEM NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
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HOUSTON, TEXAS

RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO
SIZE C
NASA DRAWING NO 1006815
SCALE NONE
WT
SHEET 2 OF 2

INCHES
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PHOTOGRAPHIC SCALE ONLY

1006815 C

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965	5 Sep 63	WK
C	REVISED PER TDRR 04181	10/30/63	WK

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE FOLLOWING:

NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE MUST OPERATE CURRENT, MAXIMUM.
SCHEMATIC DIAGRAM.
BLUE BEADING AROUND TERMINALS 1.

(b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.

(3)

(3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. LEADS SHALL BE SYMMETRICALLY POSITIONED WITH RESPECT TO ℄ OF HEADER WITHIN .010 INCH.

(4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

C. ELECTRICAL REQUIREMENTS:

(1) COIL CURRENT: PULL-IN AND DROP-OUT IN ACCORDANCE WITH TABLE I.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH:

(a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.

(5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

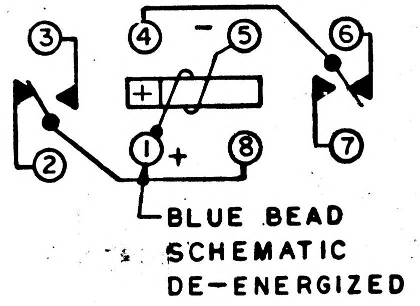
(6) OPERATE AND RELEASE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I.

(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

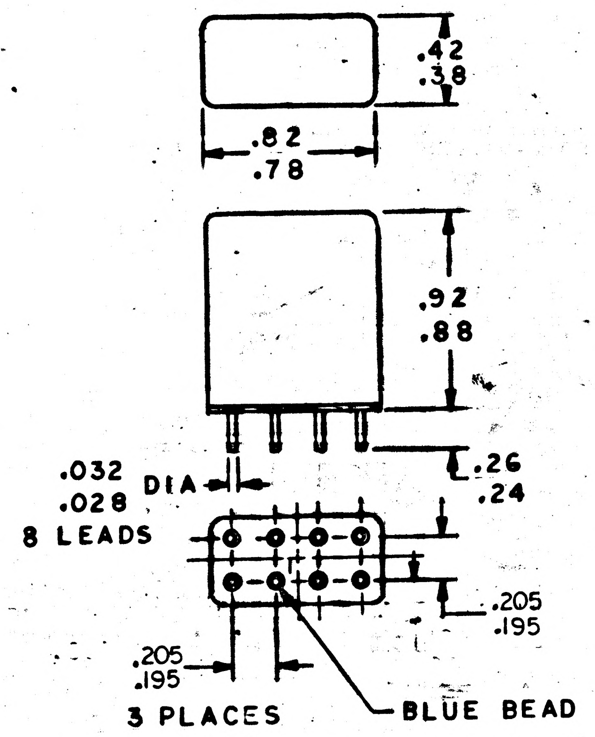
(8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.

(9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



SCHEMATIC DE-ENERGIZED



Ⓑ REPLACES REV(A) WITH CHANGES

C	C
B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Cook DATE 29 Aug 63
CHECKED J. Ruggiero Aug 29 '63
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006815
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965	5 Sep 63	WK
C	REVISED PER TDRR 04181	10/30/63	WK

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 1.5 WATTS MAXIMUM AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY) IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE) DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC BIAS.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CONTACT RESISTANCE AND MAXIMUM PULL-IN CURRENT, SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5,000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CENTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT. Ⓑ

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1, 3, 6, 7, 8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RESISTANCE OHMS @ 25°C MIN - MAX	PULL-IN CURRENT MADC MAX POSITIVE	CONTINUOUS CURRENT @ 125°C MADC MAX	SUGGESTED SOURCE VOLTAGE VDC	OPERATE SENSITIVITY MW NOM.	DROP-OUT CURRENT MADC MIN POSITIVE
-1	539 - 441	14.5	23	12.5	100	2.0
-2	720 - 880	11.2	18	16	100	1.5

Ⓑ REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN C. Craig DATE 29 Aug 63
CHECKED J. Ruggeri 23 Aug 63
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006815
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MASTER

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1006815 D

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965	5 Sep 63	WK
C	REVISED PER TDRR 04181	10/30/63	WK
D	REVISED PER TDRR 08860	6/4/64	WK

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

   D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

2. ACCEPTANCE AND INSPECTION:

   A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

   B. MECHANICAL REQUIREMENTS:

      (1) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (2) MARKING:

         (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING:
            NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
            DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
            DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE MUST OPERATE CURRENT, MAXIMUM.
            SCHEMATIC DIAGRAM.
            BLUE BEADING AROUND TERMINALS 1.

         (b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.

      (3)

      (3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. LEADS SHALL BE SYMMETRICALLY POSITIONED WITH RESPECT TO ℄ OF HEADER WITHIN .010 INCH.

      (4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

   C. ELECTRICAL REQUIREMENTS:

      (1) COIL CURRENT: PULL-IN AND DROP-OUT IN ACCORDANCE WITH TABLE I.

      (2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

      (3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

      (4) DIELECTRIC STRENGTH:

         (a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.

      (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

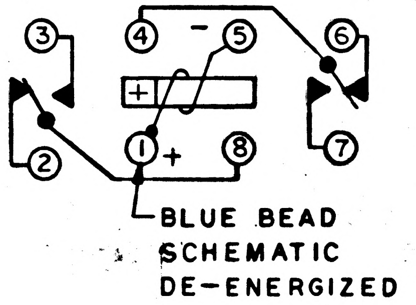
      (6) OPERATE AND RELEASE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I. WHEN TESTED PER THE APPLICABLE CIRCUIT OF MIL-R-5757

      (7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

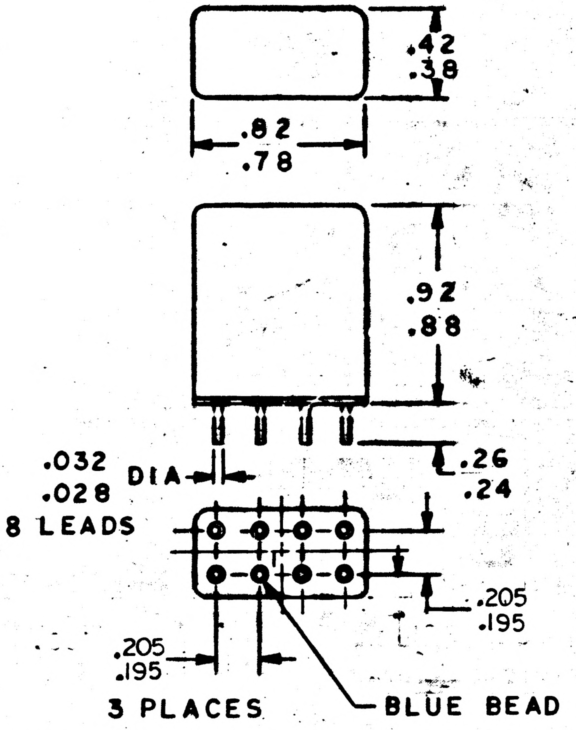
      (8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.

      (9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



SCHEMATIC DE-ENERGIZED



Ⓑ REPLACES REV(A) WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN C. Croop DATE 29 Aug 63
CHECKED J. Ruggeri Aug 29 '63
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006815
SCALE NONE WT SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965	5 Sep 63	WK
C	REVISED PER TDRR 04181	10/30/63	WK
D	REVISED PER TDRR 08860	6/2/64	WK

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 1.5 WATTS MAXIMUM AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY) IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE) DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC BIAS.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

C. QUALIFICATION REQUIREMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER ND 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CONTACT RESISTANCE AND MAXIMUM PULL-IN CURRENT, SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5,000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CENTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1, 3, 6, 7, 8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RESISTANCE OHMS @ 25°C MIN - MAX	PULL-IN CURRENT MADC MAX POSITIVE	CONTINUOUS CURRENT @ 125°C MADC MAX	SUGGESTED SOURCE VOLTAGE VDC	OPERATE SENSITIVITY MW NOM.	DROP-OUT CURRENT MADC MIN POSITIVE
-1	539 - 441	14.5	23	12.5	100	2.0
-2	720 - 880	11.2	18	16	100	1.5

Ⓑ REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. Crespi DATE 29 Aug 63
CHECKED J. Ruggeri 29 Aug 63
APPROVAL
APPROVAL Eldon C Hall 5 Sept 63
NASA APPROVAL 9/5/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006815
SCALE NONE
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006815

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	RELEASE CLASS A PER TDRR 00953	24 APR 63	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND1015404 CLASS 2.

   C. UNITS SHALL MEET ALL APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH QUALIFICATIONS AS NOTED BELOW.

2. INSPECTION & ACCEPTANCE:

   A. MECHANICAL REQUIREMENTS

      1. LEADS: UNITS SHALL HAVE WELDABLE KOVAR LEADS PER ND PS1015402 EXCEPT LEAD DIAMETER WHICH SHALL BE PER FIGURE. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

      2. FORM & ACTION: 2 FORM C CONTACTS, POLARIZED WITH MAGNETIC BIAS.

      3. CONSTRUCTION: PLUG-IN MOUNTED WITH GOLD PLATED KOVAR WIRE LEADS AND GOLD PLATED SILVER CONTACTS.

      4. SEAL: HERMETICALLY SEALED. (SEAL TEST III)

      5. LEAD PULL: 3.0 POUNDS MIN.

      6. MARKING: RELAYS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DATE CODE, DC COIL RESISTANCE, AND A SCHEMATIC DIAGRAM. THE TERMINALS SHALL BE COLOR CODED SO THAT BLUE BEADS INDICATE TERMINAL ONE.

   B. ELECTRICAL REQUIREMENTS

      1. COIL CURRENT: PULL-IN, DROP-OUT, AND MAX CONTINUOUS CURRENTS IN ACCORDANCE WITH TABLE.

      2. COIL RESISTANCE: IN ACCORDANCE WITH TABLE.

      3. COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE.

      4. COIL PULL-IN, (SENSITIVITY): IN ACCORDANCE WITH TABLE.

      5. COIL POWER, MAX DISSIPATION: 1.5 WATTS AT 25°C DERATED TO 0.5 WATTS AT 125°C.

      6. CONTACT CURRENT RATING: 2 AMPERES MAX AT 28 VDC OR 120 VAC OPEN CIRCUIT WITH RESISTIVE LOAD.

      7. CONTACT RESISTANCE: 1 OHM MAX AT 1 ma.

      8. TIME, OPERATE AND RELEASE: 20 MILLISECONDS MAX.

      9. TIME, TRANSFER: 1 MILLISECOND MAX.

      10. TIME, CONTACT BOUNCE: 1 MILLISECOND MAX.

      11. TIME, CONTACT CHATTER: 10 us MAX WHEN TESTED PER PARAGRAPH 3.B.4 OR 3.B.5.

ELECTRICAL REQUIREMENTS (CONT'D)

      12. DIELECTRIC STRENGTH (SEA LEVEL): 1000 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL, AND THE FRAME. 750 VDC MIN FOR 5 SECONDS MIN BETWEEN OPEN CONTACTS.

      13. DIELECTRIC STRENGTH (70,000 FT.): 500 VDC MIN FOR 5 SECONDS MIN WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

      14. INSULATION RESISTANCE: 1000 MEGOHMS MIN AT 500 VDC BETWEEN—
         (a) MUTUALL INSULATED TERMINALS
         (b) OPEN SWITCHING CONTACTS, ENERGIZED OR NOT
         (c) COIL AND CASE AT 25°C (500 MEGOHMS AT 125°C)
         (d) CONTACTS AND FRAME

3. DESIGN REQUIREMENTS:

   A. LIFE, MINIMUM: RELAYS SHALL BE CAPABLE OF 100,000 ON-OFF CYCLES OPERATION WITHOUT MISSING. THIS APPLIES OVER THE ENTIRE OPERATING TEMPERATURE RANGE AND FOR ALL CURRENTS UP TO RATED CONTACT CURRENT.

4. SPECIAL CONDITIONING: (BY MANUFACTURER)

   A. BURN IN: EACH RELAY SHALL BE RUN FOR 5000 CYCLES AT A FREQUENCY OF 5 CPS OR LESS WITH A RESISTIVE LOAD CURRENT OF 20 ua MAX AT 20 MV DC. THERE SHALL BE NO OPENS, SHORTS OR CONTACT RESISTANCE IN EXCESS OF 1000 OHMS. PULL-IN, AND DROP-OUT CURRENT REQUIREMENTS SHALL BE MET AFTERWARDS. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED WITH EACH LOT TOGETHER WITH AN ACCURATE RECORD OF THE TOTAL NUMBER SUBJECTED TO THIS TEST, THE NUMBER FAILED AND THE TIME (OR CYCLES) TO FAILURE.

   FOLLOWING BURN IN, RELAYS SHALL BE TESTED AND SHALL MEET THE REQUIREMENTS OF NOTE 2,B,6,7,8,9 & 10.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
MATERIAL —	DRAWN Louis A Lowe DATE 23-4-63 CHECKED George Ross 4/24/63 APPROVAL 4/24/63 APPROVAL	RELAY ,ELECTROMAGNETIC, SENSITIVE SPECIFICATION CONTROL DRAWING
HEAT TREATMENT —	NASA APPROVAL 4/24/63	CODE IDENT NO. · SIZE C · NASA DRAWING NO. 1006815
FINAL FINISH —	MIT APPROVAL 24 Apr 63	SCALE — · WT · SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

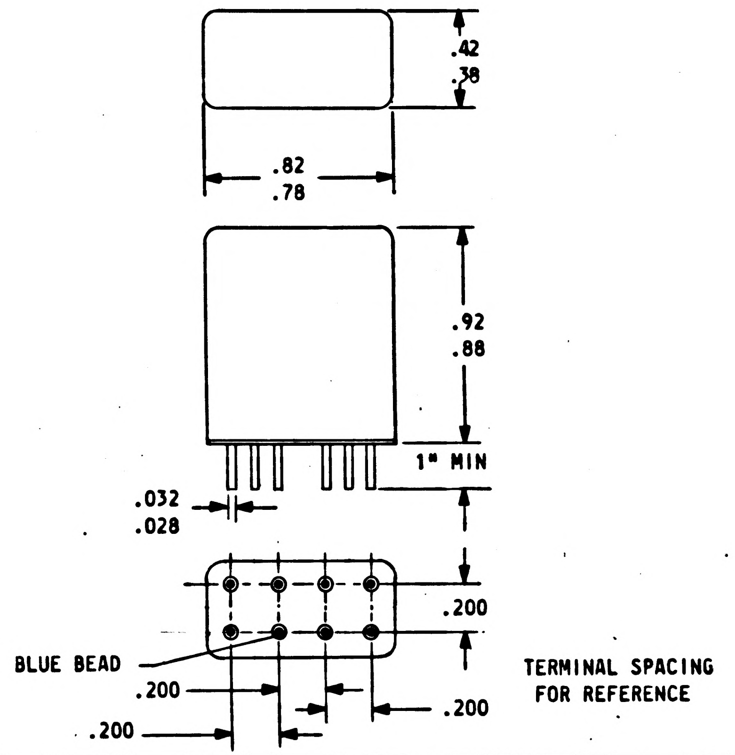
1006815

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THA THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

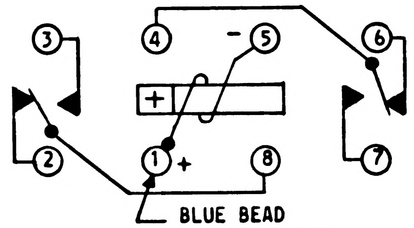
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS A RELEASE PER TDRR 00953	24Apr63	WK

DASH NO.	COIL RES OHMS(±10%)	PULL-IN MADC(MAX)	DROP-OUT MADC(MIN)	MAX CONT. CURRENT MADC AT 125°C
-1	490	14.5	2.0	23
-2	770	11.2	1.5	18



TERMINAL SPACING FOR REFERENCE



ELECTRICAL SCHEMATIC
DE-ENERGIZED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Louis A Lowf DATE 23-4-63
CHECKED [illegible] 4/24/63
APPROVAL [illegible] 4/24/63
APPROVAL
NASA APPROVAL [illegible] 4/24/63
MIT APPROVAL [illegible] 24 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY ,ELECTROMAGNETIC, SENSITIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006815
SCALE —
WT
SHEET 2 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006817

REVISIONS

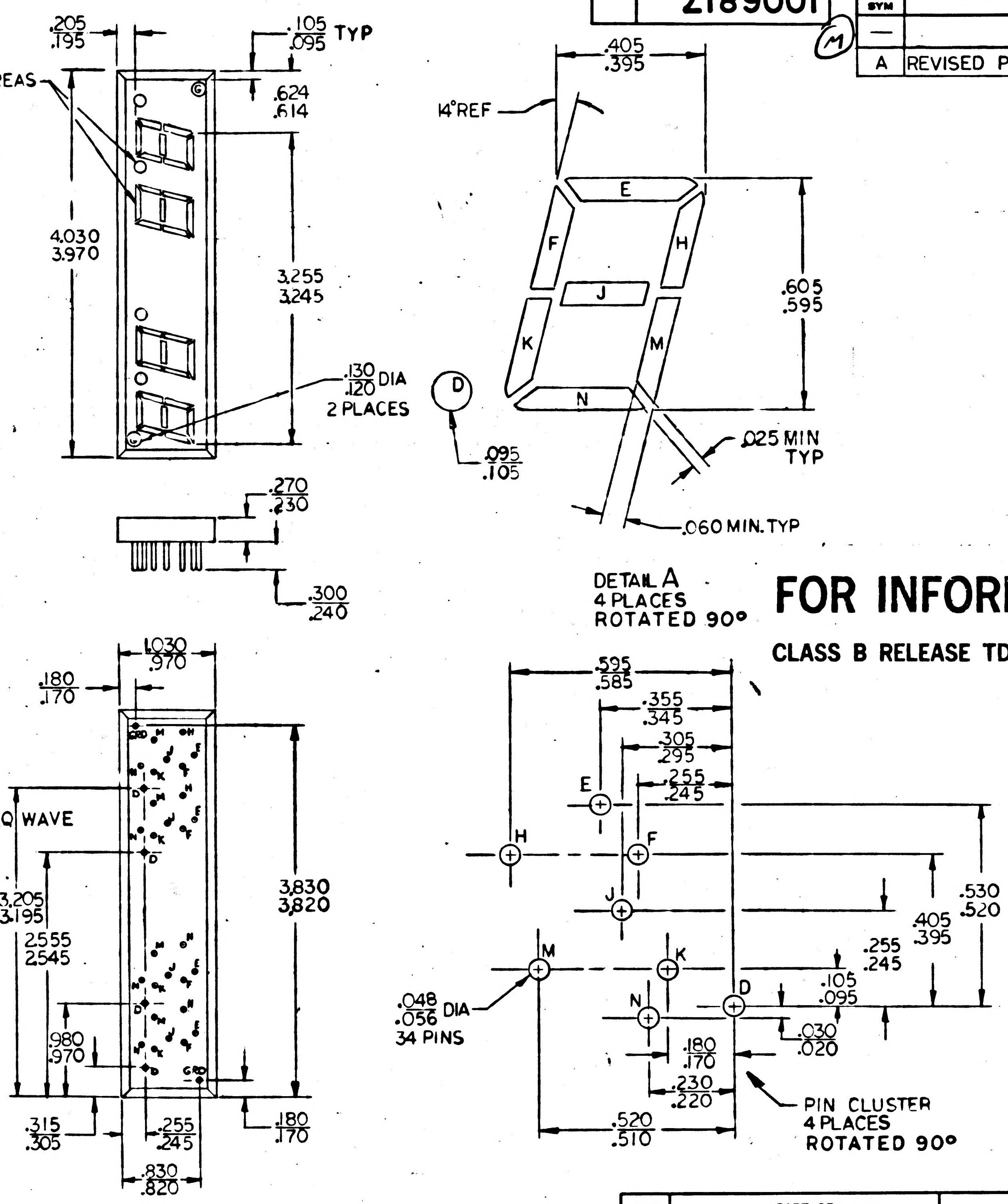
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01483	6/5/63	ECH /

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



.205 / .195
.105 / .095 TYP
LUMINESCENT AREAS SEE DETAIL A
.624 / .614
4.030 / 3.970
3.255 / 3.245
.130 / .120 DIA 2 PLACES
.270 / .230
.300 / .240
1.030 / .970
.180 / .170
3.830 / 3.820
3.205 / 3.195
2.555 / 2.545
.980 / .970
.315 / .305
.255 / .245
.830 / .820
.180 / .170
.405 / .395
14° REF
E
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.605 / .595
D
.095 / .105
.025 MIN TYP
.060 MIN. TYP
DETAIL A 4 PLACES ROTATED 90°
.595 / .585
.355 / .345
.305 / .295
.255 / .245
.530 / .520
.405 / .395
.255 / .245
.105 / .095
.048 / .056 DIA 34 PINS
.030 / .020
.180 / .170
.230 / .220
.520 / .510
PIN CLUSTER 4 PLACES ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 20 MAY 63
CHECKED 13 May 63
APPROVAL 22 May 63
APPROVAL 6/5/63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY— ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006817
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

B	1006817

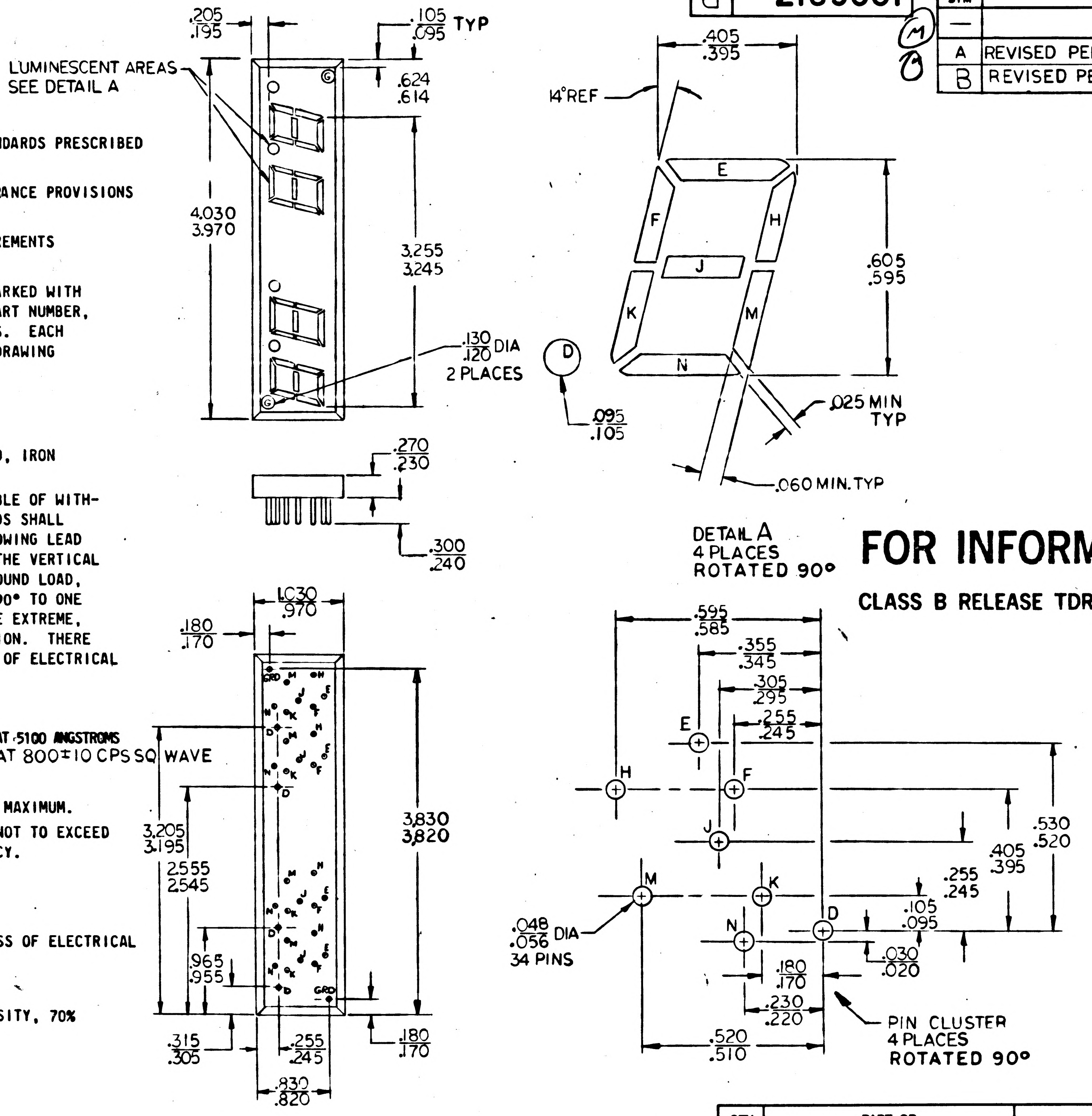
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01483	4/5/63	ECH /
B	REVISED PER TDRR 1632	6/19/63	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



DETAIL A
4 PLACES
ROTATED 90°

PIN CLUSTER
4 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN [illegible] DATE 3 MAY 63
CHECKED J. Ruggeri / H. Maynard 13 May 63
APPROVAL [illegible] 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL [illegible] 5/22/63
MIT APPROVAL [illegible] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY— ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006817
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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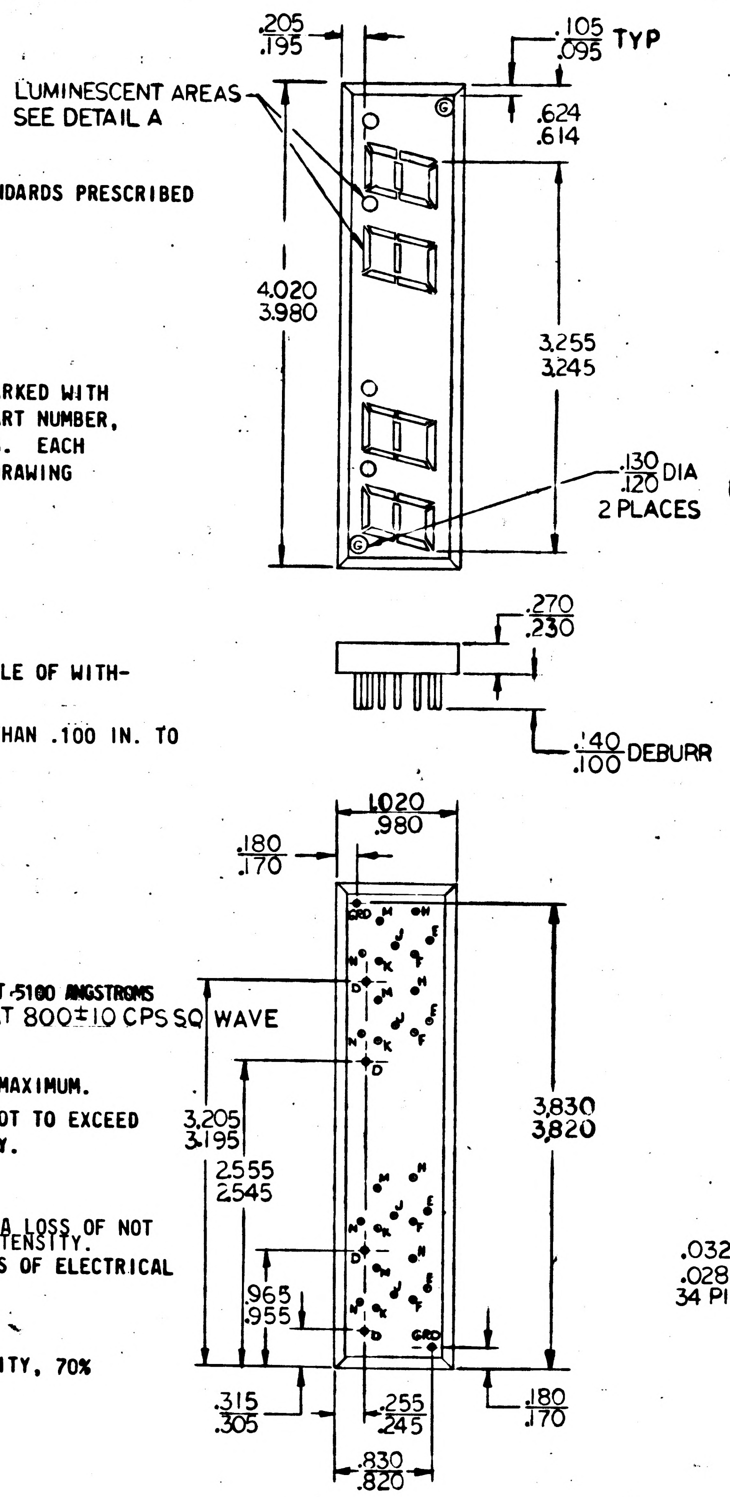
1006817 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01483	4/5/63	ECH /
B	REVISED PER TDRR 1632	4/18/63	L.E.L.
C	REVISED PER TDRR 02766	9/5/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.



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LUMINESCENT AREAS
SEE DETAIL A
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2 PLACES
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.140
.100 DEBURR
1.020
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3.195
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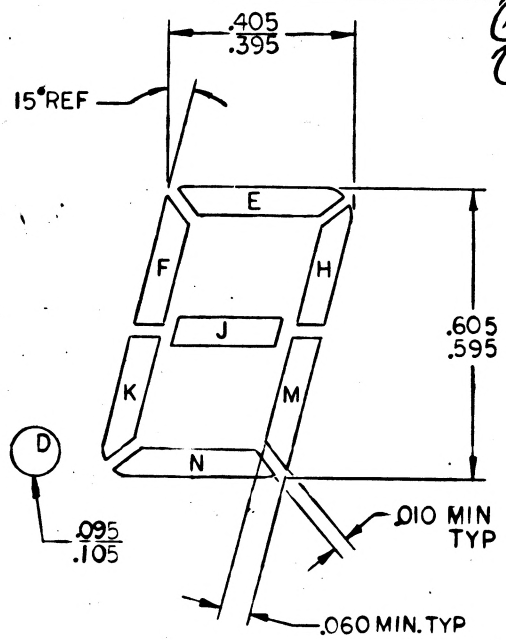

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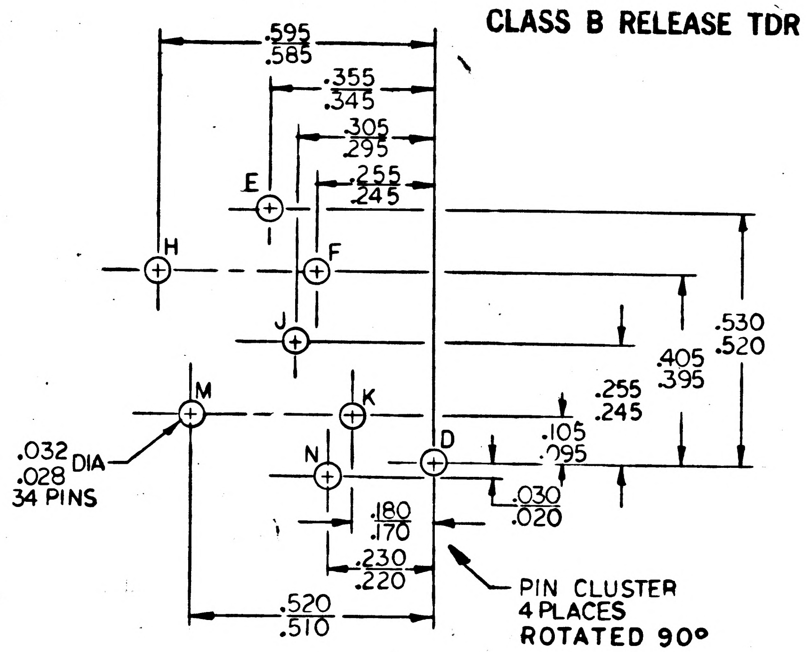
DETAIL A
4 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 **DATE** 5/22/63



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.520
.510

PIN CLUSTER
4 PLACES
ROTATED 90°

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 3 MAY 63
CHECKED J. Ruggeri / H Maynard 13 May 63
APPROVAL 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006817
SCALE NONE	WT	SHEET 1 OF 1

1006817

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006817 D

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01483	4/5/63	ECH /
B	REVISED PER TDRR 1632	4/19/63	L.E.L.
C	REVISED PER TDRR 02966	9/5/63	
D	REVISED PER TDRR 04187	10/24/63	

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION (100%):

A. MECHANICAL PROPERTIES:

(1) LEAD MATERIAL: BRASS, TIN PLATED

(2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

(3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).

B. ELECTRICAL CHARACTERISTICS:

(1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE

(2) POWER FACTOR: 0.25 MAXIMUM.

(3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

(4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.

3. DESIGN REQUIREMENTS:

A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.

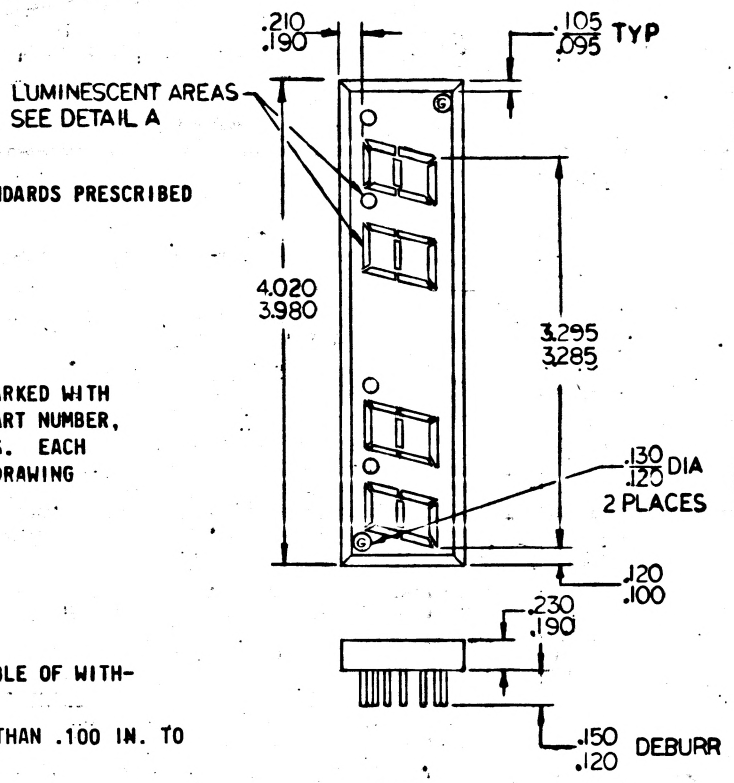
B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.

B. CONSTRUCTION:

(1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.

(2) INSULATION BOARD: XXXP PLASTIC.

(3) PROTECTIVE FRAME: ALUMINUM.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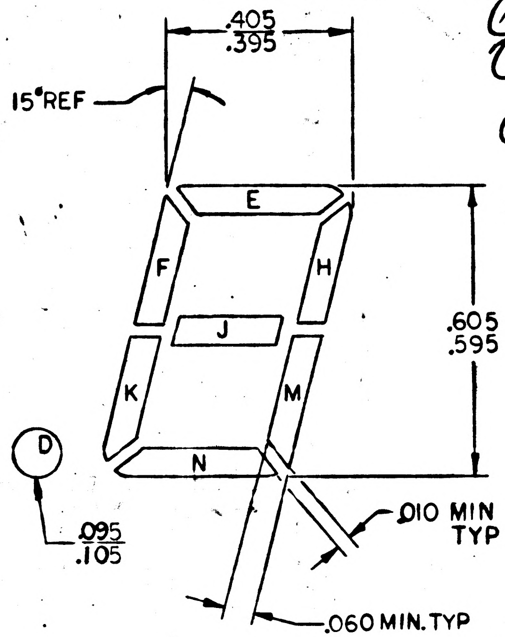
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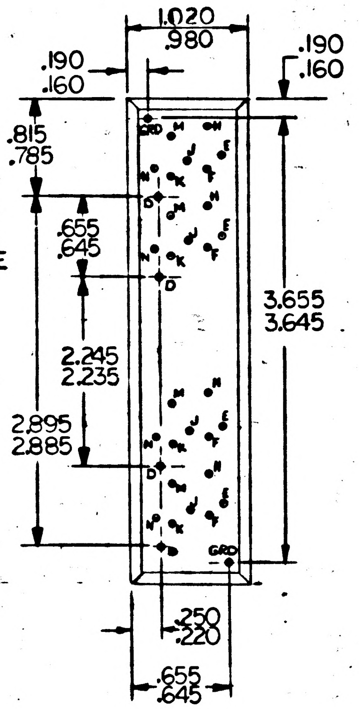
.060 MIN. TYP

DETAIL A
4 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/28/63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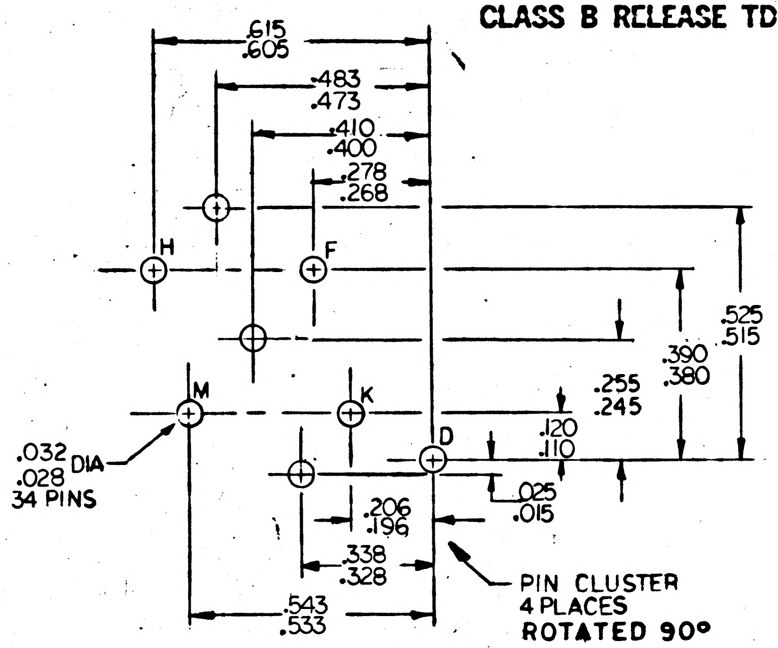
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.543 .533

PIN CLUSTER
4 PLACES
ROTATED 90°

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 13 MAY 63
CHECKED J. Ruggeri 13 May 63
APPROVAL 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006817
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006817 E

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

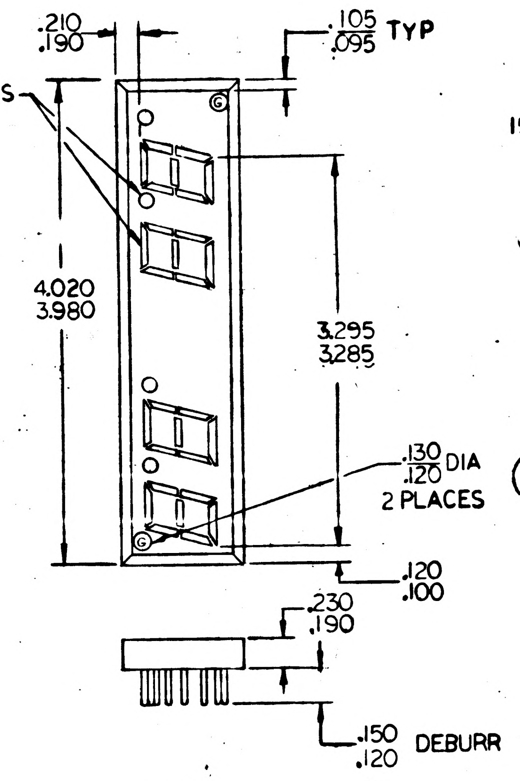
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01483	4/5/63	ECH / [illegible]
B	REVISED PER TDRR 1632	4/19/63	L.E.L.
C	REVISED PER TDRR 02766	9/5/63	[illegible]
D	REVISED PER TDRR 04187	10/24/63	WR.
E	REVISED PER TDRR 04401	5/26/63	WR.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. [illegible] PERFORMANCE AT 0°C TO +55°C.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER



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3.295
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2 PLACES
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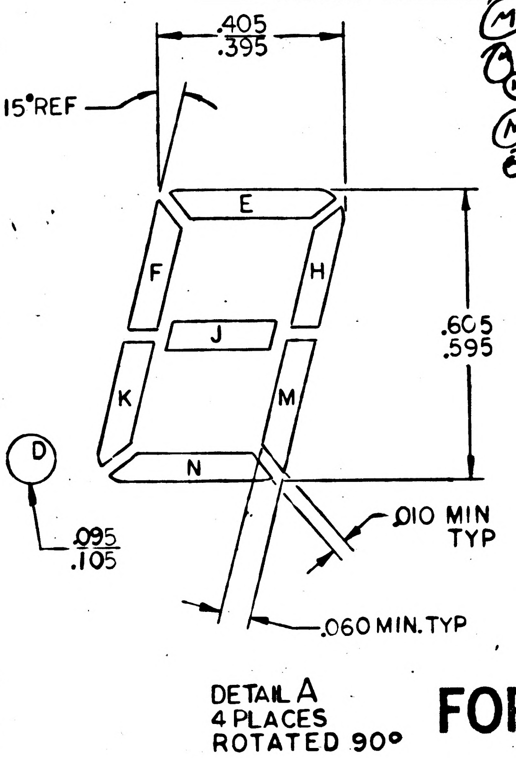

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TYP
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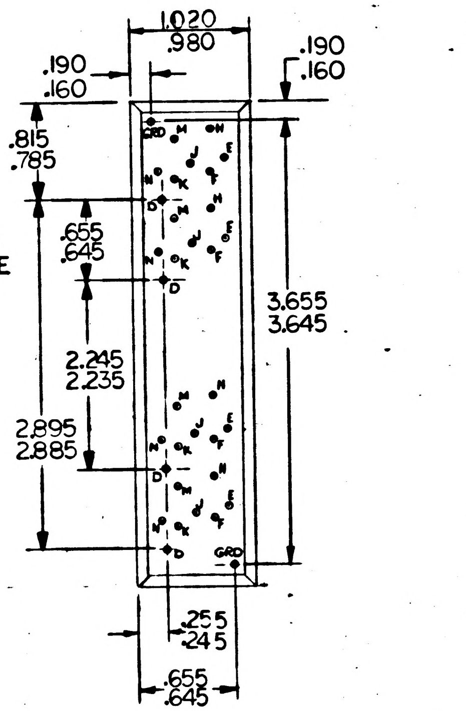
DETAIL A
4 PLACES
ROTATED 90°



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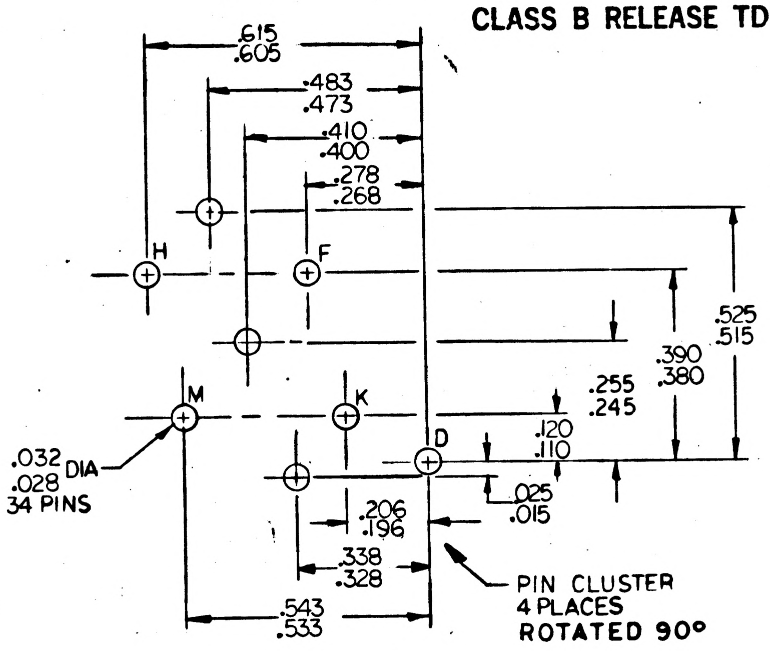

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PIN CLUSTER
4 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. M. Lamphi DATE 3 MAY 63
CHECKED J. Ruggeri / F. Maynard 13 May 63
APPROVAL [illegible] 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL [illegible] 5/22/63
MIT APPROVAL [illegible] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY— ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006817
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006817

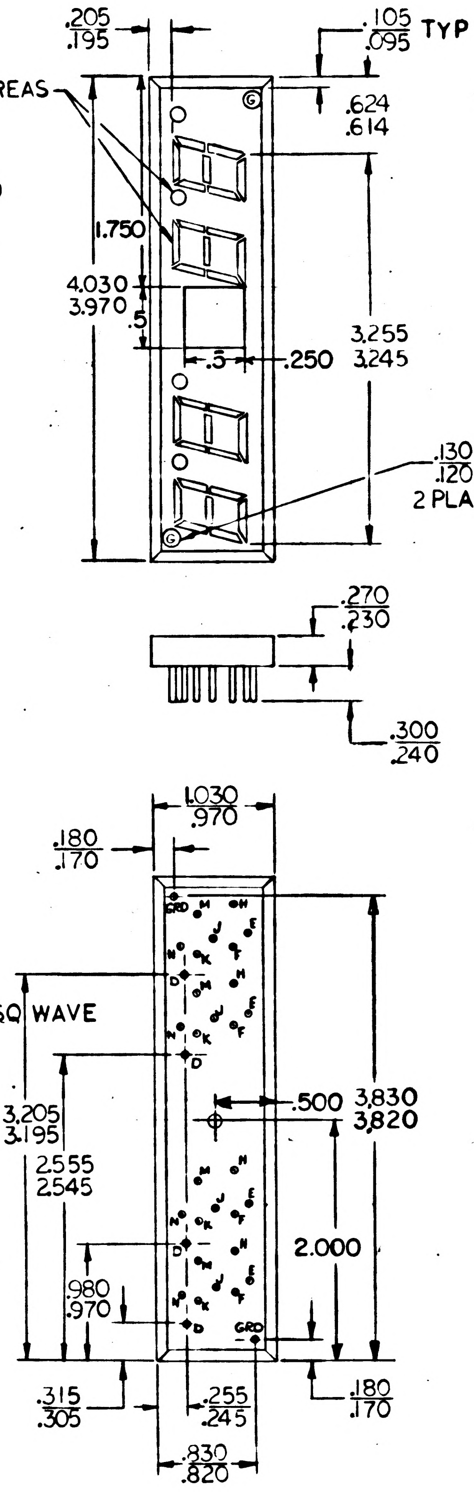
SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			
—			

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.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LUMINESCENT AREAS
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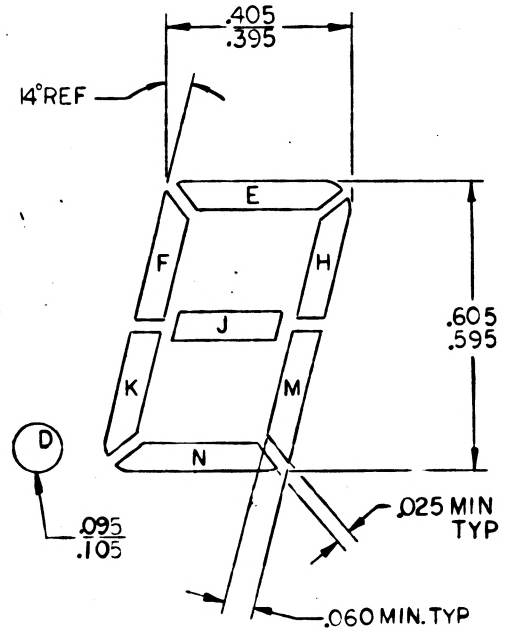
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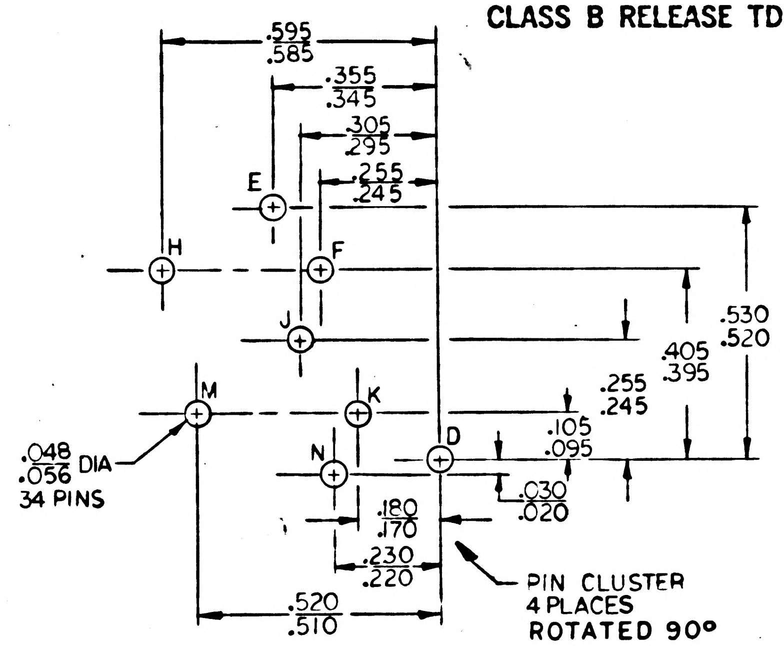
DETAIL A
4 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63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.056 DIA
34 PINS

PIN CLUSTER
4 PLACES
ROTATED 90°

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 3 MAY 63
CHECKED 13 May 63
APPROVAL 22 May 63
APPROVAL

NASA APPROVAL 5/22/63

MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006817
SCALE NONE
WT
SHEET 1 OF 1

1006817

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

8189001

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01484	6/5/63	

REVISIONS

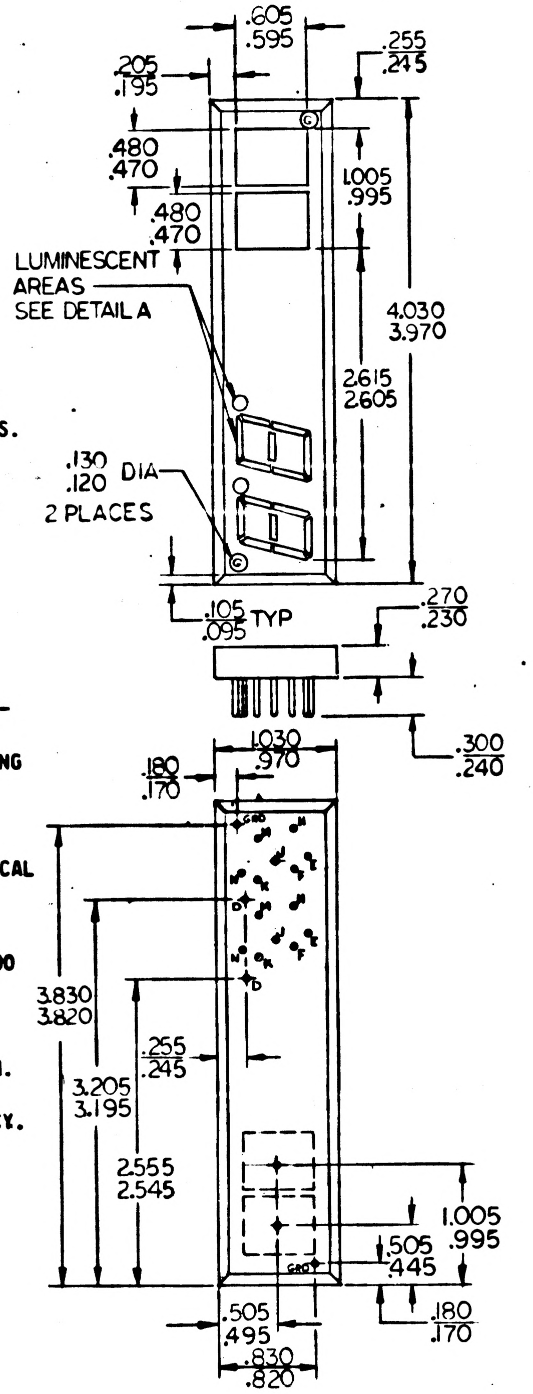
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10-FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS. SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER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LUMINESCENT AREAS SEE DETAIL A
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2 PLACES
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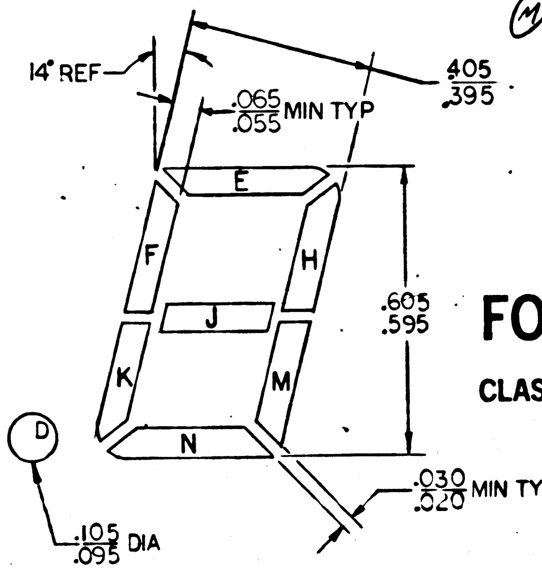
14° REF
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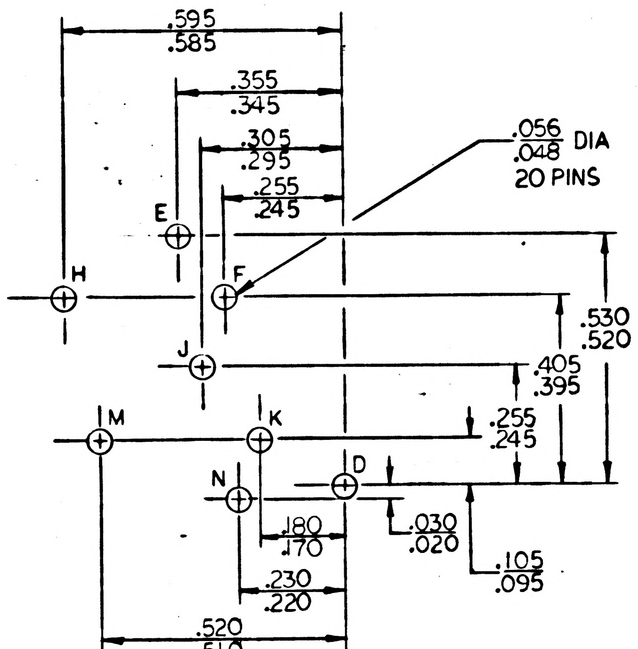
DETAIL A
2 REQD
ROTATED 90°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PIN CLUSTER
2 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 6/22/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 7 MAY 63
CHECKED W. J. Gifford 3 MAY 63
APPROVAL 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY— ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006818
SCALE NONE | WT | SHEET 1 OF 1

1006818

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 8189001

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01484	6/5/63	
B	REVISED PER TDRR 02966	9/5/63	

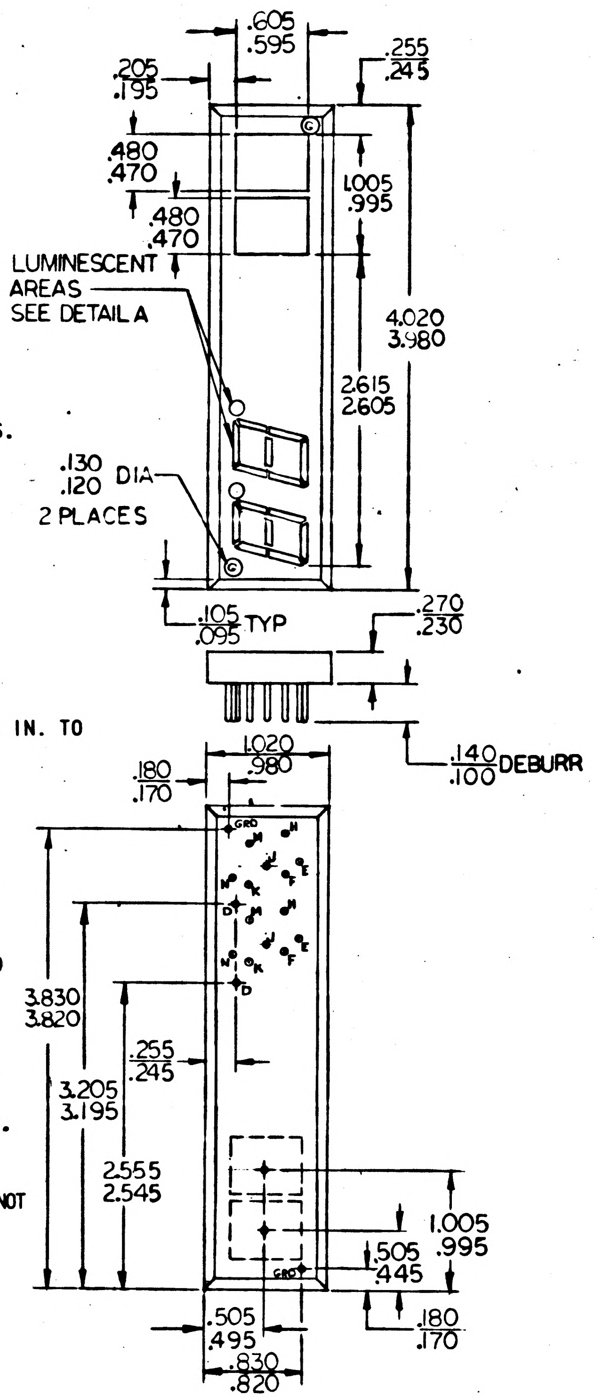
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10-FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS. SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM, WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.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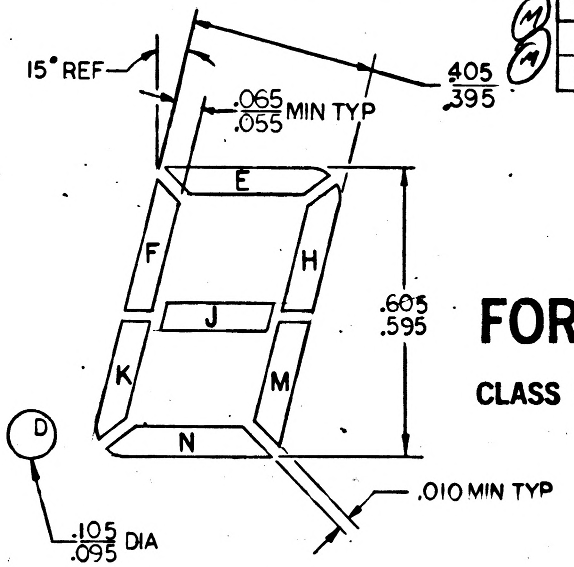
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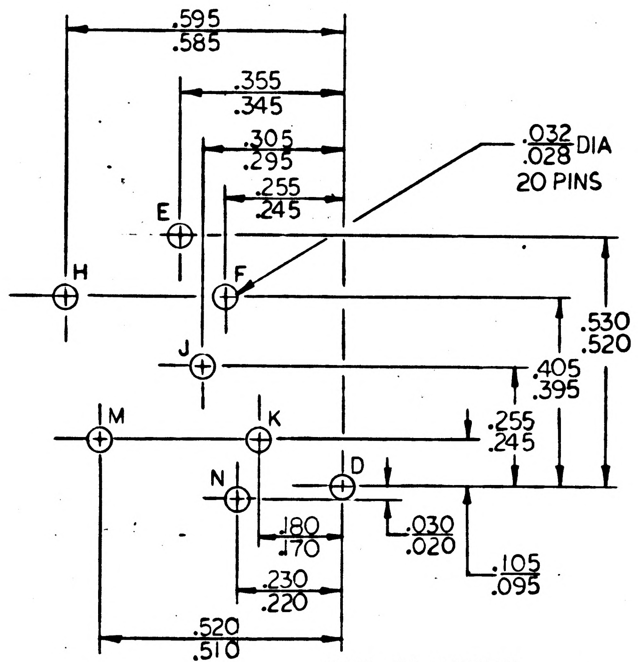
DETAIL A
2 REQD
ROTATED 90°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PIN CLUSTER
2 PLACES
ROTATED 90°

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R F M Knapp DATE 1 MAY 63
CHECKED W. J. Gifford / H. Maynard 3 MAY 63
APPROVAL F. T. Driscoll 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006818
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

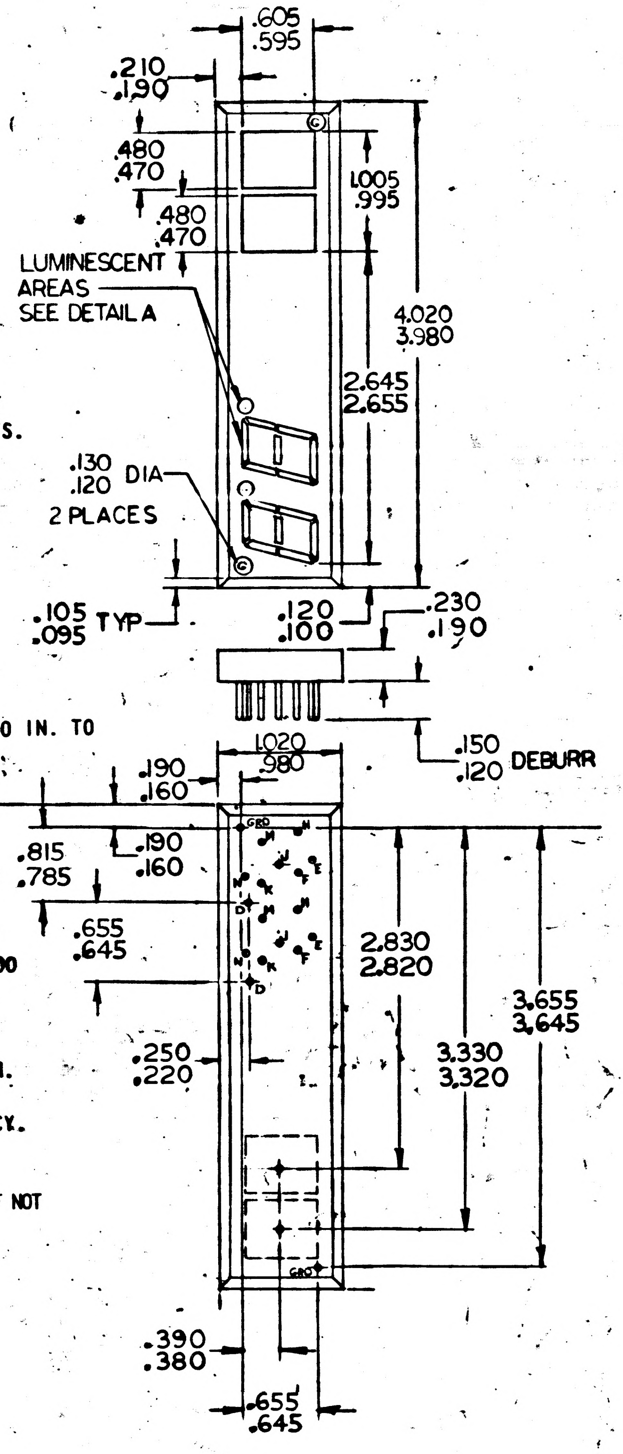
C 8189001

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01484	6/5/63	
B	REVISED PER TDRR 02966	9/5/63	
C	REVISED PER TDRR 04184		WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS. SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM, WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.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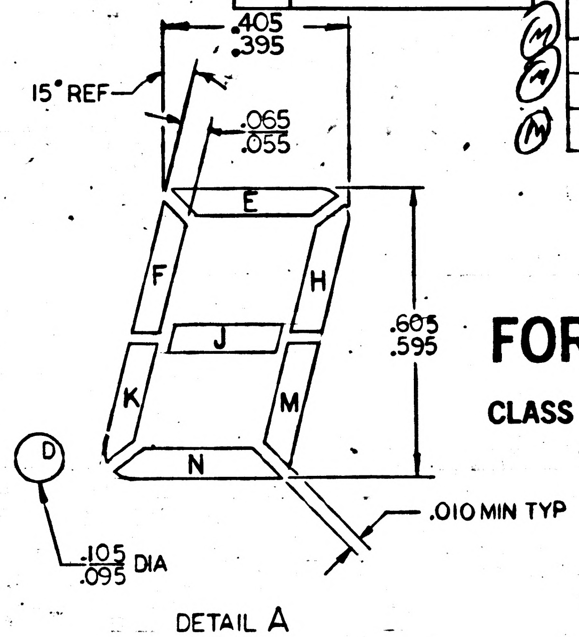
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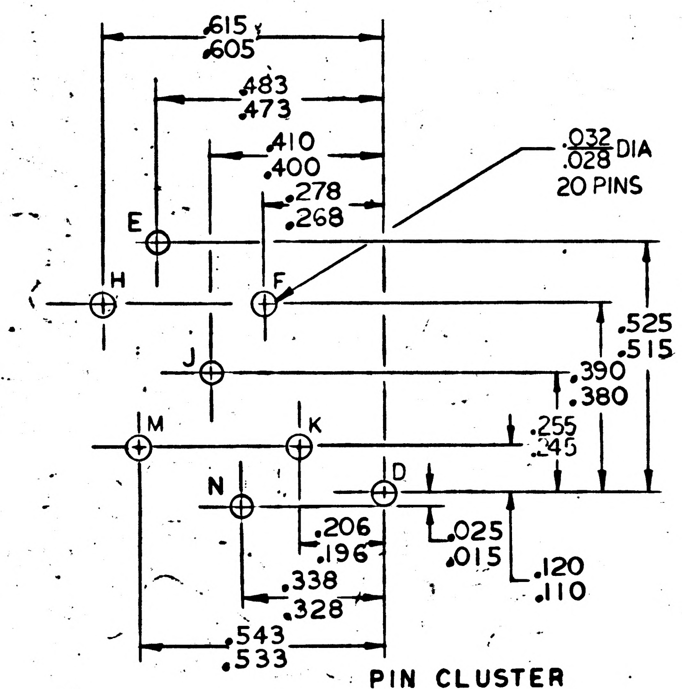
DETAIL A
2 REQD
ROTATED 90°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PIN CLUSTER
2 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 13 MAY 63
CHECKED W. J. Gifford 13 MAY 63
APPROVAL 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—
ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006818
SCALE NONE WT SHEET 1 OF 1

INCHES
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PHOTOGRAPHIC SCALE ONLY

D	8189001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01484	6/5/63	
B	REVISED PER TDRR 02966	9/5/63	
C	REVISED PER TDRR 04184.		WK
D	REVISED PER TDRR 04400	5 Nov 63	WK

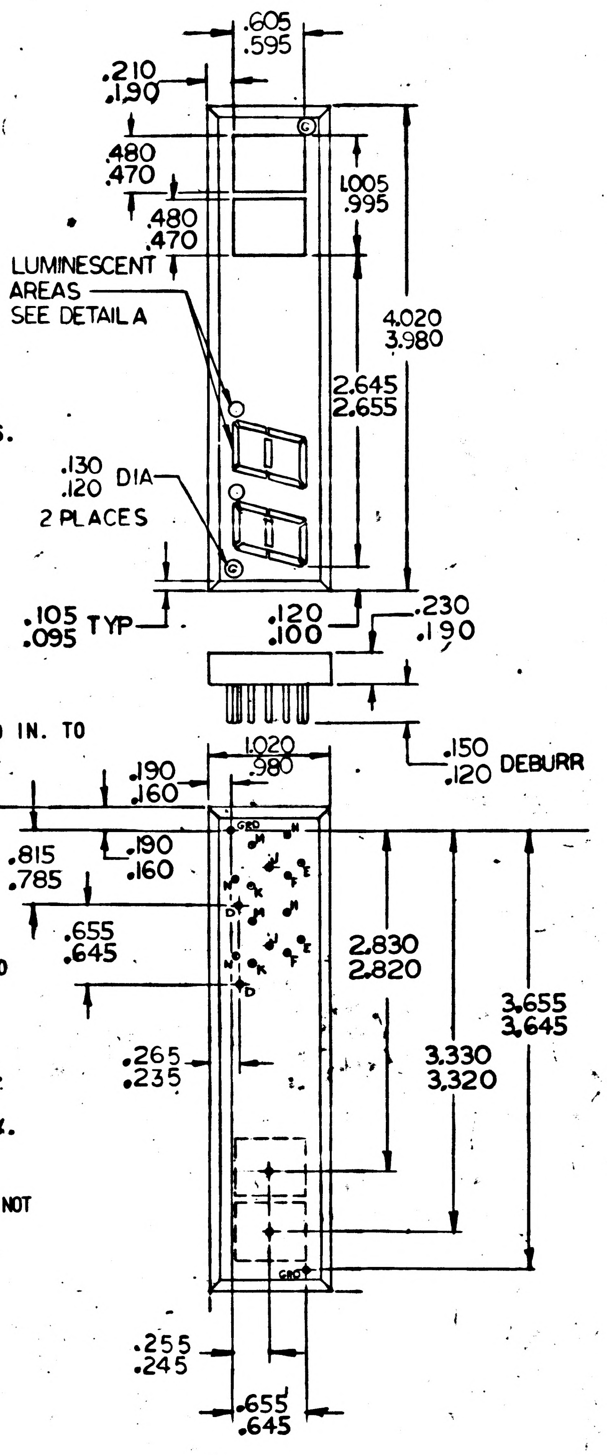
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10-FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS. SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM, WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.

     [illegible] ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.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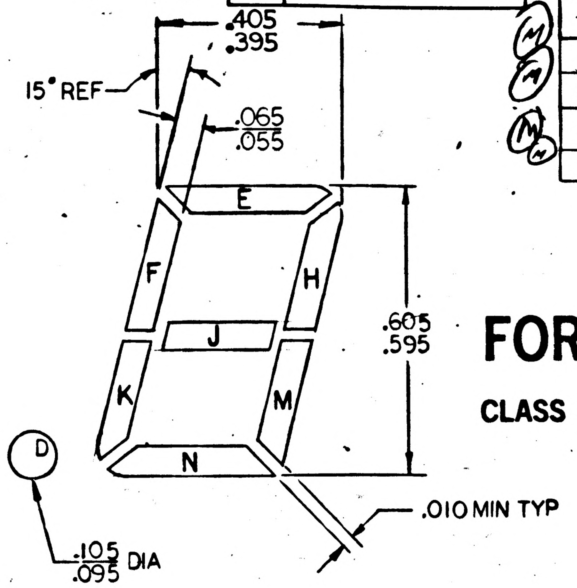
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DETAIL A
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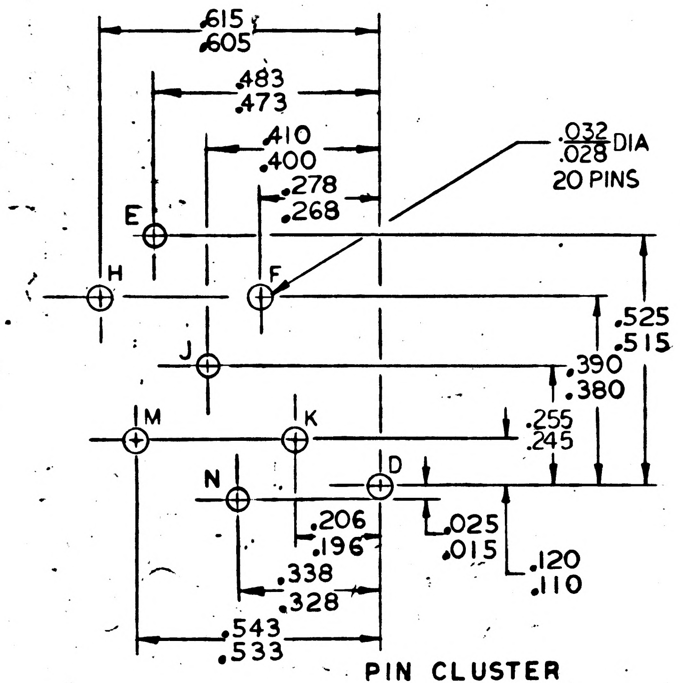
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63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PIN CLUSTER
2 PLACES
ROTATED 90°

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R F M Smith DATE 7 MAY 63
CHECKED W. J. Gifford / H. Maynard 13 MAY 63
APPROVAL F. T. Driscoll 22 May 63
APPROVAL Eldon C Hall 6/5/63
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—
ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006818
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES
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PHOTOGRAPHIC SCALE ONLY

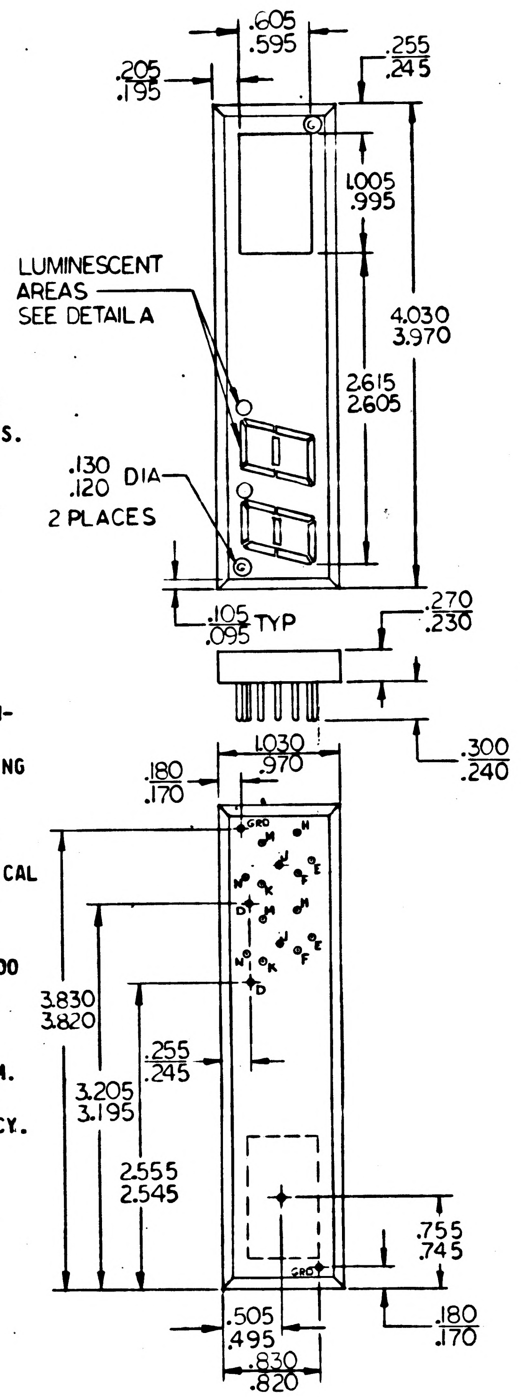
8189001

SYM	DESCRIPTION	DATE	APPROVAL
REVISIONS			
—			

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDOR SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10-FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS. SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.



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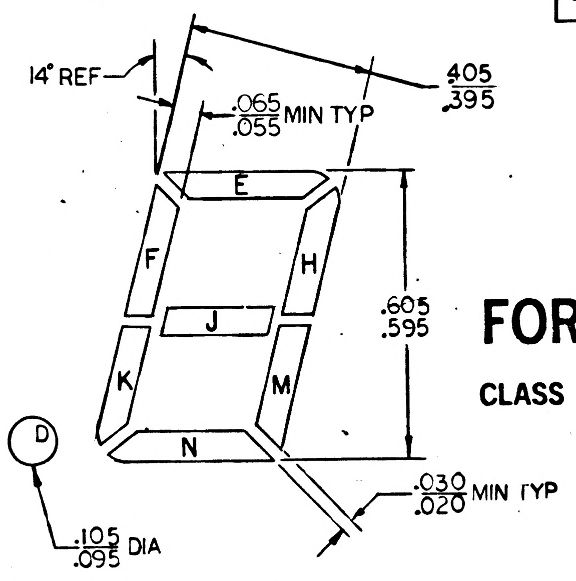

14° REF
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DETAIL A
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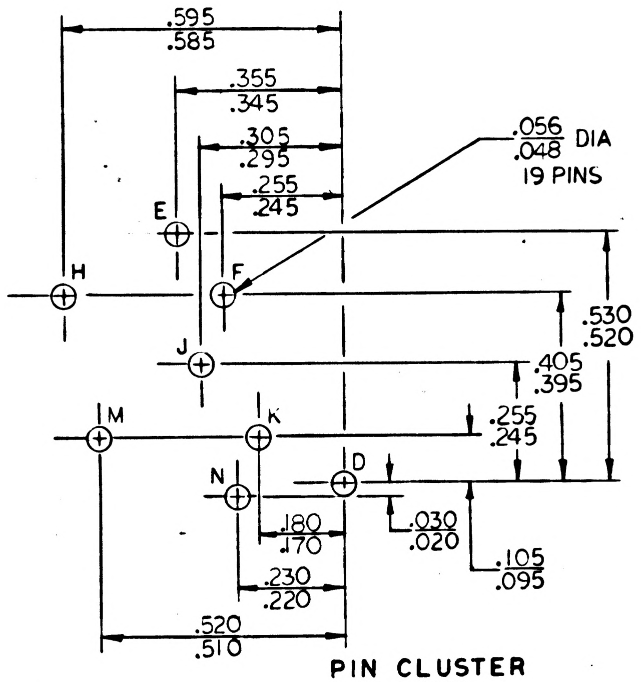

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PIN CLUSTER
2 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R F McKnight DATE 4 MAY 63
CHECKED W. J. Gifford / H. Maynard 13 MAY 63
APPROVAL F T Driscoll 22 May 63
APPROVAL
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006818
SCALE NONE WT SHEET 1 OF 1

1006818

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

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∀ 6189001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
(M) —			
A	REVISED PER TDRR 02966	9/5/63	

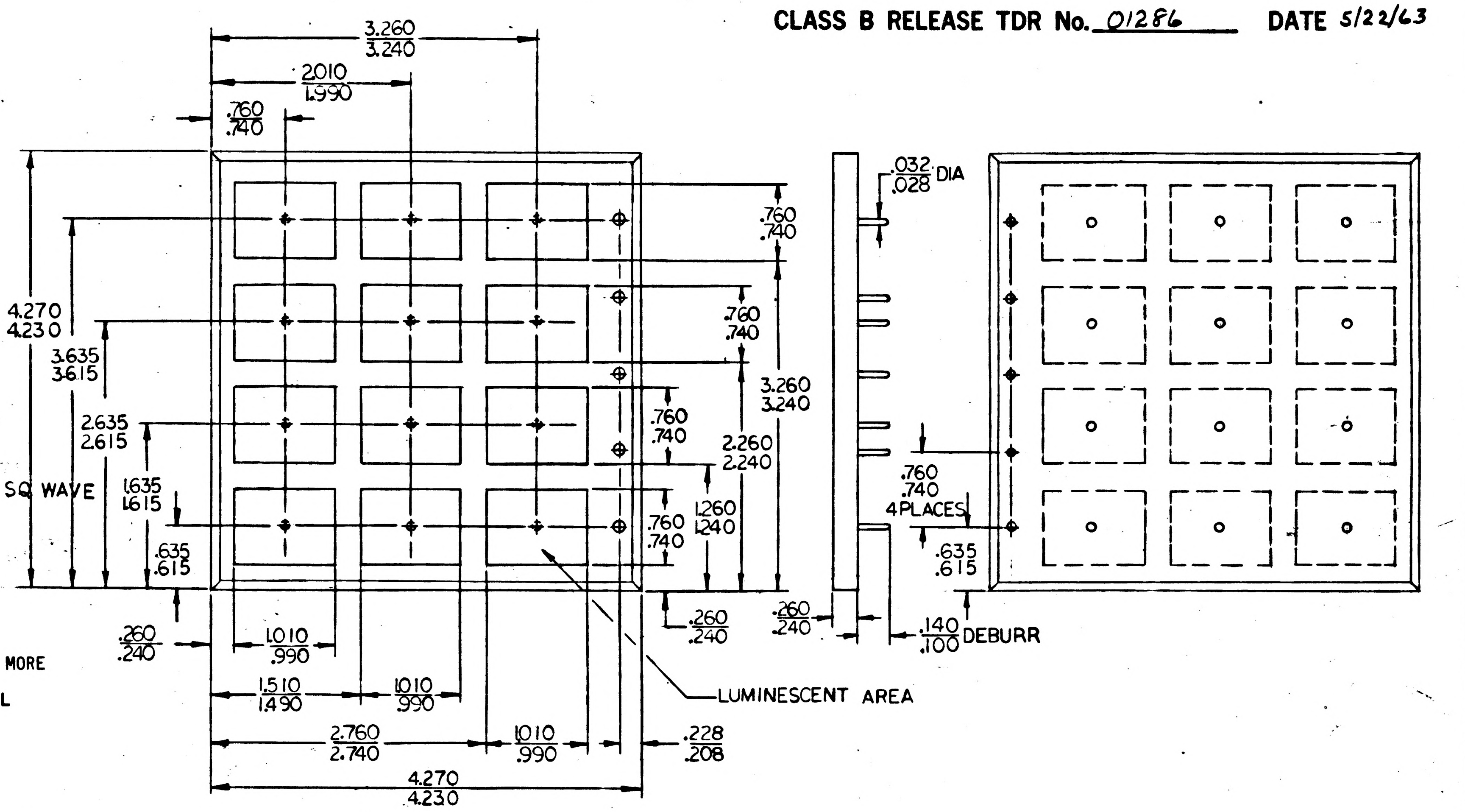
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NECTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63



MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R.M. Langl SYMS DATE 3 MAY 63
CHECKED J. Ruggi / H. Heynold 13 MAY 63
APPROVAL J.C. Driscoll 22 May 63
APPROVAL
NASA APPROVAL 5/22/63
MIT APPROVAL Nazel 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006819
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B 6189001

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02966	9/3/63	
B	REVISED PER TDRR 04183	10/21/63	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

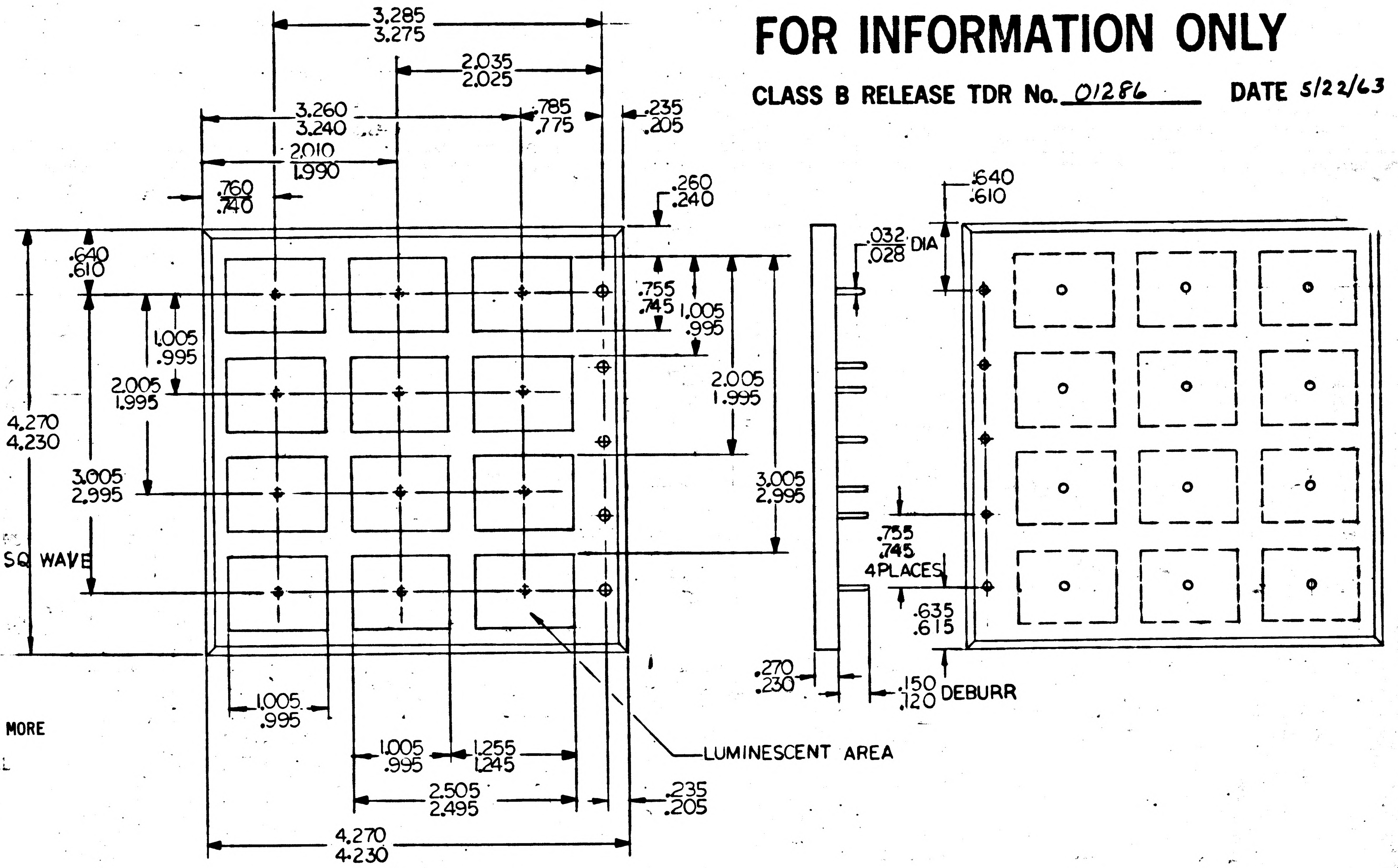
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. STORAGE LIFE: 1 YEAR [illegible] OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NECTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN MD 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 **DATE** 5/22/63



MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN ZFM Lang DATE 3 MAY 63
CHECKED J. Rugger / H. Maynard 13 MAY 63
APPROVAL J. F. Driscoll 22 May 63
APPROVAL
NASA APPROVAL 5/22/63
MIT APPROVAL L. Nagel 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—
ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006819
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

6189001

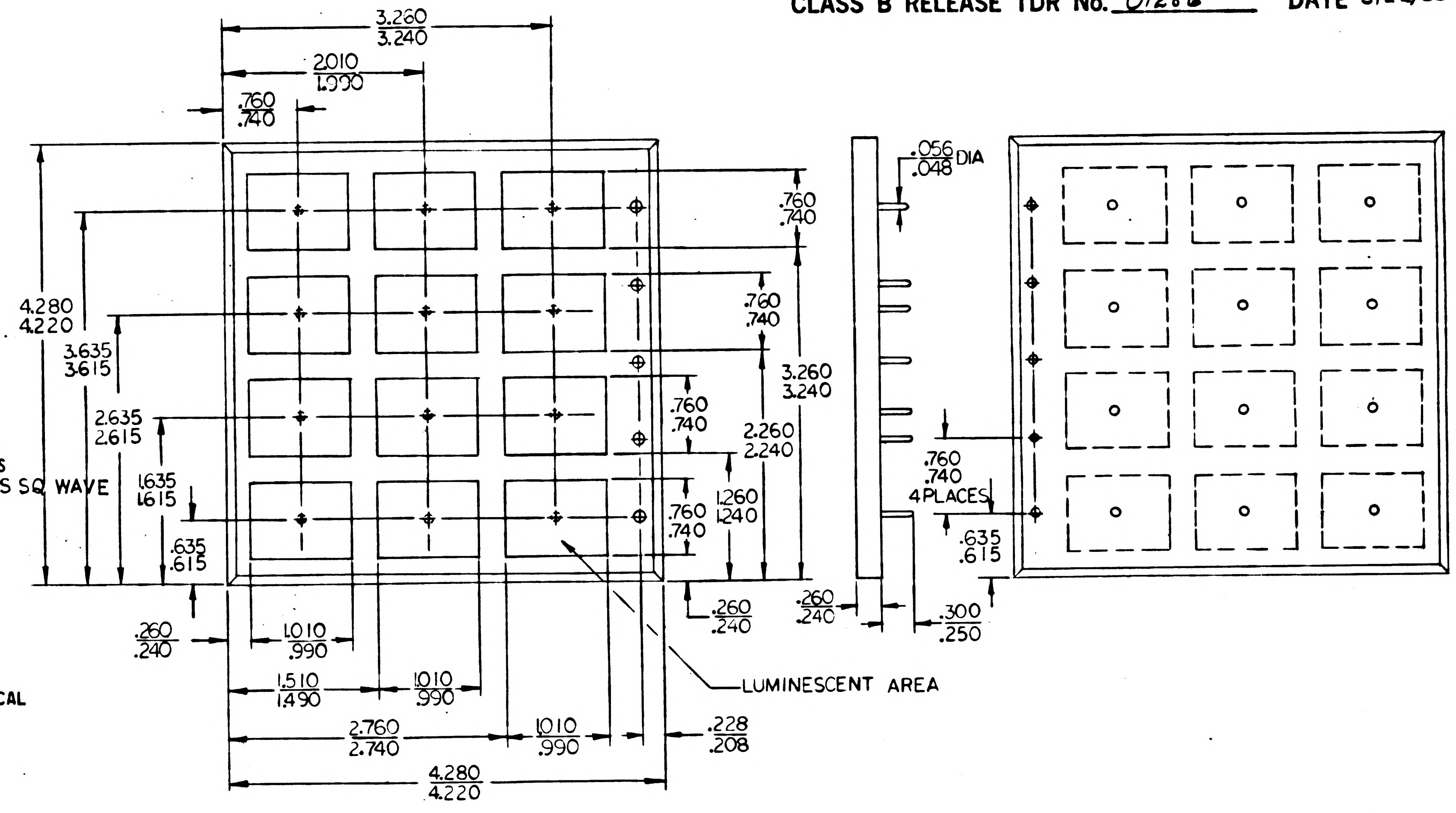
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. VENDORS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002056.
   - D. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: WELDABLE GOLD PLATED, IRON NICKEL ALLOY PER ND PS 1015405.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL. LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST TWICE. WITH THE LEAD IN THE VERTICAL AXIAL POSITION AND SUPPORTING A 2 POUND LOAD, BEND THE COMPONENT BODY IN A PLANE, 90° TO ONE SIDE, THEN 180° BACK TO THE OPPOSITE EXTREME, THEN 90° BACK TO THE STARTING POSITION. THERE SHALL BE NO PHYSICAL DAMAGE OR LOSS OF ELECTRICAL PERFORMANCE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10-FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10CPS SQ WAVE
     - (2) POWER FACTOR: 0.2 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +55°C.
   - C. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NECTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 3 MAY 63
CHECKED 13 MAY 63
APPROVAL 22 May 63
APPROVAL

NASA APPROVAL 5/22/63

MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006819

SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006820 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A PER TDRR 04298	10/30/63	W.K.

(M)

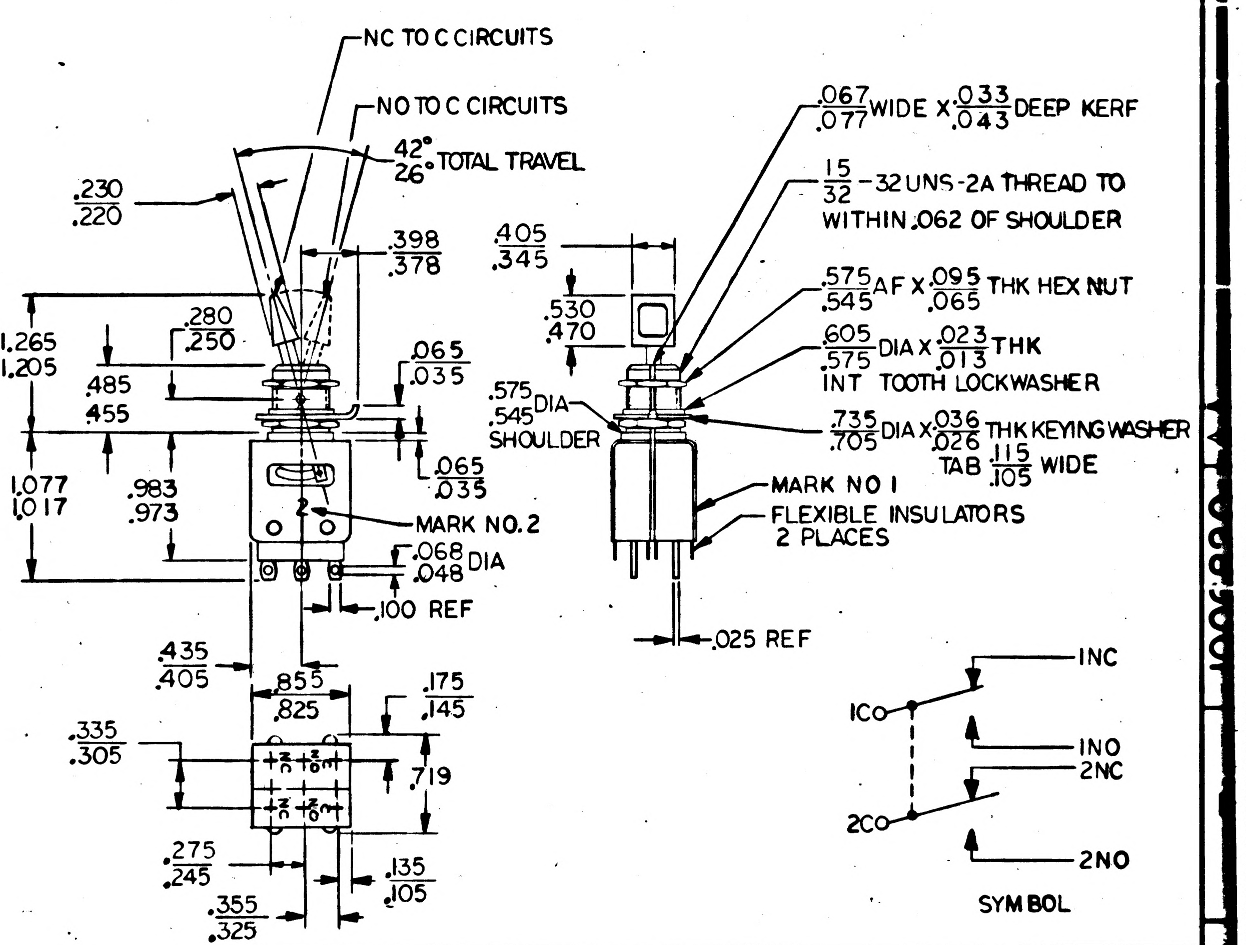
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCH SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-3950, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNITS SHALL BE MARKED PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, SWITCH NUMBER, TERMINAL IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: SHALL BE PLATED FOR SOLDERING. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: DOUBLE POLE, DOUBLE THROW.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS (10 MICROAMPERES MAXIMUM LEAKAGE).
     - (1) AT 65,000 FEET: 500 VOLTS RMS.
   - D. ACTUATING FORCE: ONE (1) TO FIVE (5) POUNDS.
   - E. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:
   - A. TEMPERATURE RANGE: -300°F TO +250°F.
   - B. CONTACT RATING:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
       - RESISTIVE: 5 AMPERES.
       - INDUCTIVE: 3 AMPERES.
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
       - RESISTIVE: 5 AMPERES.
       - INDUCTIVE: 3 AMPERES.
     - (3) INRUSH CURRENT: 24 AMPERES.
   - C. ENDURANCE: 25,000 CYCLES, MINIMUM.
   - D. STRENGTH OF ACTUATOR: 25 POUNDS.
   - E. STRENGTH OF TERMINALS: 5 POUNDS.
   - F. CONTACT VOLTAGE DROP: ONE (1) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - G. HANDLE: ALUMINUM.
   - H. SENSITIVE SWITCHES: SHALL BE HERMETICALLY SEALED.


NC TO C CIRCUITS
NO TO C CIRCUITS
42°/26° TOTAL TRAVEL
.230/.220
.398/.378
.405/.345
.530/.470
.280/.250
1.265/1.205
.485/.455
.065/.035
.575/.545 DIA SHOULDER
.065/.035
1.077/1.017
.983/.973
MARK NO. 2
.068/.048 DIA
.100 REF
.067/.077 WIDE X .033/.043 DEEP KERF
15/32 -32 UNS-2A THREAD TO WITHIN .062 OF SHOULDER
.575/.545 AF X .095/.065 THK HEX NUT
.605/.575 DIA X .023/.013 THK INT TOOTH LOCKWASHER
.735/.705 DIA X .036/.026 THK KEYING WASHER TAB .115/.105 WIDE
MARK NO 1
FLEXIBLE INSULATORS 2 PLACES
.025 REF
.435/.405
.855/.825
.175/.145
.335/.305
.719
.275/.245
.135/.105
.355/.325
INC
ICo
INO
2NC
2Co
2NO
SYMBOL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		DO NOT SCALE THIS DRAWING	DRAWN Tony Killeen DATE 4 APR 63 CHECKED Bernard A Gelberg 30 APR 63 APPROVAL APPROVAL Eldon C Hall 8 May 63	SWITCH, TOGGLE SPECIFICATION CONTROL DRAWING
		MATERIAL SEE NOTES		
		HEAT TREATMENT NONE	NASA APPROVAL 5/15/63	CODE IDENT NO. — SIZE C — NASA DRAWING NO. 1006820
		FINAL FINISH NONE	MIT APPROVAL W Kupfer 15 May 63	SCALE NONE — WT — SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B	1006820

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A PER TDRR 04298	10/30/63	W.R.
B	REVISED PER TDRR 12311	9/1/64	

Ⓜ Ⓜ

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

   B. SWITCH SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-3950, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

   C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404, CLASS 2.

   D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.

   E. MARKING: UNITS SHALL BE MARKED ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, SWITCH NUMBER, TERMINAL IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   A. TERMINALS: ~~SHALL BE PLATED FOR SOLDERING.~~ CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

   B. CONTACT ARRANGEMENT: PER TABLE ~~DOUBLE THROW.~~

   C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS (10 MICROAMPERES MAXIMUM LEAKAGE).

      (1) AT 65,000 FEET: 500 VOLTS RMS.

   D. ACTUATING FORCE: ONE (1) TO FIVE (5) POUNDS.

   E. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

   A. TEMPERATURE RANGE: -300°F TO +250°F.

   B. CONTACT RATING:

      (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
      RESISTIVE: 5 AMPERES.
      INDUCTIVE: 3 AMPERES.

      (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
      RESISTIVE: 5 AMPERES.
      INDUCTIVE: 3 AMPERES.

      (3) INRUSH CURRENT: 24 AMPERES.

   C. ENDURANCE: 25,000 CYCLES, MINIMUM.

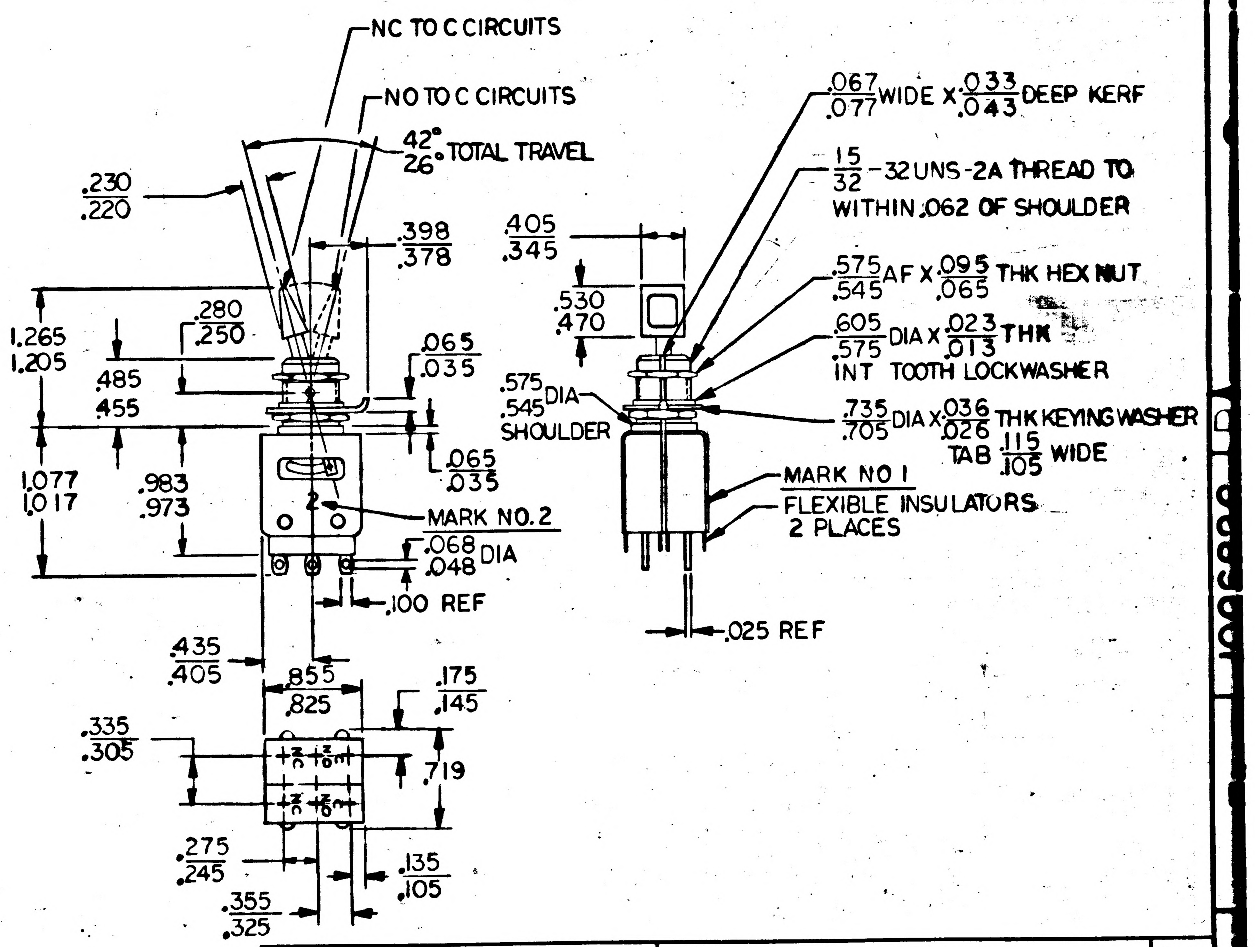
   D. STRENGTH OF ACTUATOR: 25 POUNDS.

   E. STRENGTH OF TERMINALS: 5 POUNDS.

   F. CONTACT VOLTAGE DROP: ONE (1) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.

   G. HANDLE: ~~ALUMINUM.~~

   H. SENSITIVE SWITCHES: SHALL BE HERMETICALLY SEALED.


NC TO C CIRCUITS
NO TO C CIRCUITS
42° / 26° TOTAL TRAVEL
.230 / .220
.398 / .378
.405 / .345
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.530 / .470
1.265 / 1.205
.485 / .455
.065 / .035
.575 / .545 DIA SHOULDER
.065 / .035
1.077 / 1.017
.983 / .973
2
MARK NO. 2
.068 / .048 DIA
.100 REF
.067 / .077 WIDE X .033 / .043 DEEP KERF
15/32 -32 UNS-2A THREAD TO WITHIN .062 OF SHOULDER
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.735 / .705 DIA X .036 / .026 THK KEYING WASHER TAB .115 / .105 WIDE
MARK NO 1
FLEXIBLE INSULATORS 2 PLACES
.025 REF
.435 / .405
.855 / .825
.175 / .145
.335 / .305
.719
.275 / .245
.135 / .105
.355 / .325

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Tom Hillson DATE 9 APR 63
CHECKED Bernard A Yelung 30 APR 63
APPROVAL
APPROVAL Eldon C Hall 8 May 63
NASA APPROVAL 5/15/63
MIT APPROVAL 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006820
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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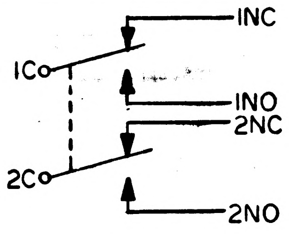
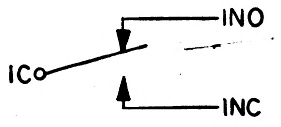
1006820 B

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	THIS SHEET ADDED PER TDRR 12311	9/1/64	

DASH NO.	CONTACT SWITCHING ARRANGEMENT	NO. OF SWITCHES	SCHEMATIC
1006820-000	DOUBLE POLE DOUBLE THROW	2	
1006820-001	SINGLE POLE DOUBLE THROW	1 + 1 (DUMMY)	

Ⓑ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN G. RICE DATE 8-28-64
CHECKED A. Marts 8-31-64
APPROVAL G. MAYO
APPROVAL

NASA APPROVAL 9/1/64

MIT APPROVAL 9/1/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006820

SCALE NONE WT SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SWITCH SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S- 6744 EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404, CLASS 2.

D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055, AS AMENDID HEREIN.

E. MARKING: UNITS SHALL BE MARKED ND1002019 , WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, SWITCH NUMBER, TERMINAL IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. TERMINALS: SHALL BE PLATED FOR SOLDERING.
CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

B. CONTACT ARRANGEMENT: PER TABLE ~~DOUBLE THROW~~

C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS (2 MILLIAMPS MAXIMUM LEAKAGE).

(1) AT 65,000 FEET: 300 VOLTS RMS. (2 MILLIAMPS MAXIMUM LEAKAGE)

D. ACTUATING FORCE: ONE-HALF (1/2) TO THREE (3) POUNDS.

E. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TEMPERATURE RANGE: -65°F TO +250°F.

B. CONTACT RATING:

(1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
RESISTIVE: 5 AMPERES.
INDUCTIVE: 3 AMPERES.

(2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
RESISTIVE: 5 AMPERES.
INDUCTIVE: 3 AMPERES.

(3) INRUSH CURRENT: 24 AMPERES.

C. ENDURANCE: 25,000 CYCLES, MINIMUM.

D. STRENGTH OF ACTUATOR: 25 POUNDS.

E. STRENGTH OF TERMINALS: 5 POUNDS.

F. CONTACT VOLTAGE DROP: ONE (1) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.

G. HANDLE: ALUMINUM, DULL SATIN ANODIZE

H. SENSITIVE SWITCHES: SHALL BE HERMETICALLY SEALED.

J. VIBRATION: PER ND 1002055, EXCEPT 5-2000 CPS AT 15 G, 0 TO PEAK. DURING VIBRATION THERE SHALL BE NO TRANSFER OF CONTACTS FROM ONE POSITION TO ANOTHER AND NO MOMENTARY OPENING OR CLOSING OF CONTACTS IN EXCESS OF 10 MICROSECONDS.

K. SHOCK: PER ND 1002055, EXCEPT 78 G HALF SINE WAVE SHOCK INPUT, 11 MILLISECOND PULSE DURATION, NON-OPERATING.

NO PARTS SHALL BREAK LOOSE FROM THE SWITCH ASSEMBLY AND THE SWITCH ASSEMBLY SHALL BE RETAINED IN ITS MOUNTED POSITION. DEFORMATION OF THE SWITCH ASSEMBLY & FAILURE TO OPERATE AFTER SHOCK TESTING ARE ALLOWABLE.

L. LIFE: PER ND 1002055, EXCEPT TEST SHALL CONSIST OF 25,000 ACTUATIONS PERFORMED AT AN ACTUATION CYCLING RATE OF 6 ACTUATIONS PER MINUTE. AFTER LIFE TEST THE SWITCH SHALL BE ELECTRICALLY AND MECHANICALLY FUNCTIONAL AND CONTACT RESISTANCE SHALL BE WITHIN THE LIMITS OF 500 MILLIOHMS MAXIMUM WHEN CHECKED UNDER ACTUAL LIFE TEST LOAD CONDITIONS.

M. AMBIENT PRESSURE RANGE: SEA LEVEL TO 10^{-4} MILLIMETERS OF MERCURY ABSOLUTE.

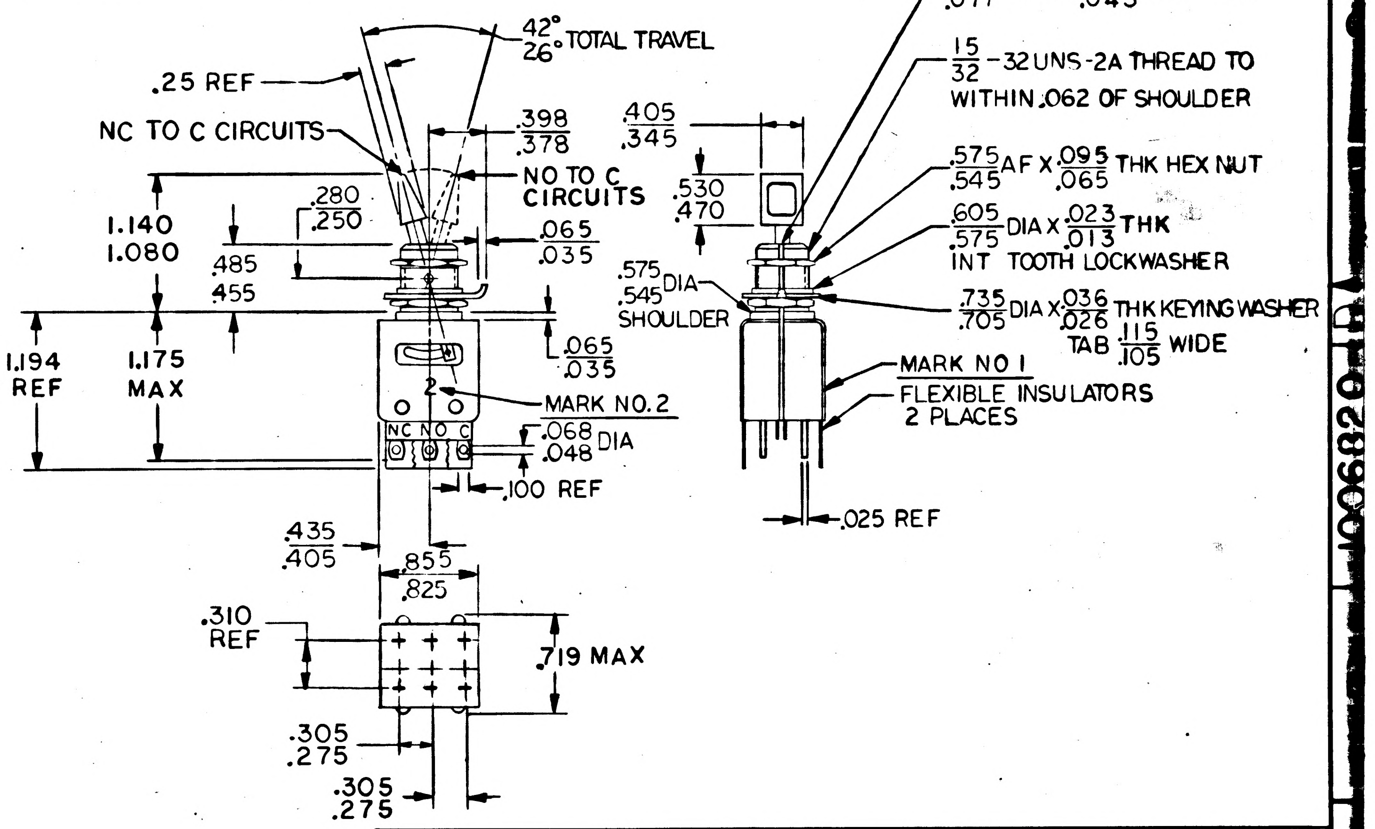
N. HIGH ALTITUDE OPERATION: SWITCHES SHALL BE CAPABLE OF OPERATION AT AN AMBIENT PRESSURE OF 10^{-4} MM HG ABSOLUTE FOR 4 DAYS.

P. OXYGEN ATMOSPHERE: SWITCH ASSEMBLY SHALL BE CAPABLE OF OPERATING IN AMBIENT ATMOSPHERE OF 100% OXYGEN AT PRESSURES VARYING FROM 10^{-4} MMHG ABSOLUTE TO 15 PSIA WITHOUT CAUSING EXPLOSION OR TOXIC CORROSIVE OUTGRASSING.

R. MATERIALS SHALL NOT EXHIBIT TOXIC OR CORROSIVE OUTGRASSING UNDER ANY OF THE ENVIRONMENTAL CONDITIONS.

S. SHOCK, OPERATING: PER ND 1002055, EXCEPT 50 G'S, 1/2 SINE WAVE SHOCK INPUT, 11 MSEC. PULSE DURATION, OPERATING. DURING OPERATING SHOCK TESTING, THERE SHALL BE NO TRANSFER OF CONTACTS FROM ONE POSITION TO ANOTHER & NO MOMENTARY OPENING OR CLOSING OF CONTACTS IN EXCESS OF 2 M SECONDS.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A PER TDRR 04298	10/30/63	WR
B	REVISED PER TDRR 12311	9/1/64	
C	REVISED PER TDRR 15513	1/26/65	WR
D	REVISED PER TDRR 15622	1/26/65	WR



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Tony Killeen DATE 9 APR 63
CHECKED A. Bernie A. Yelang 30 APR 63
APPROVAL
APPROVAL Eldon C Hall 8 May 63
NASA APPROVAL 5/15/63
MIT APPROVAL 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006820
SCALE NONE
WT
SHEET 1 OF 2

MASTER

4 3 2 1

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1006820 D

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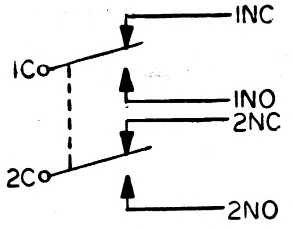
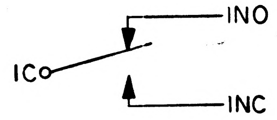
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	THIS SHEET ADDED PER TDRR 12311	9/1/64	
C	REVISED PER TDRR 15513	1/26/65	WH
D	REVISED PER TDRR 15622	1/26/65	WH

DASH NO.	CONTACT SWITCHING ARRANGEMENT	NO. OF SWITCHES	SCHEMATIC
1006820-000	DOUBLE POLE DOUBLE THROW	2	
1006820-001	SINGLE POLE DOUBLE THROW	1 + 1 (DUMMY)	
1006820-002	SAME AS	1006820-000	BASIC SWITCH SHALL BE PER DWG 1010901
1006820-003	SAME AS	1006820-001	

Ⓑ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MASTER

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN G. RICE DATE 8-28-64
CHECKED A Marks 8-31-64
APPROVAL G. MAYO
APPROVAL

NASA APPROVAL 9/1/64

MIT APPROVAL 9/1/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006820

SCALE NONE WT SHEET 2 OF 2

4 3 2 1

1006820

SYM	DESCRIPTION	DATE	APPROVAL
—			

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCH SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-3950, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNITS SHALL BE MARKED PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, SWITCH NUMBER, TERMINAL IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: ~~SHALL BE PLATED FOR SOLDERING.~~ A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: DOUBLE POLE, DOUBLE THROW.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS (10 MICROAMPERES MAXIMUM LEAKAGE).
     (1) AT 65,000 FEET: 500 VOLTS RMS.
   - D. ACTUATING FORCE: ONE (1) TO FIVE (5) POUNDS.
   - E. MARKING: PER PARAGRAPH 1 E.

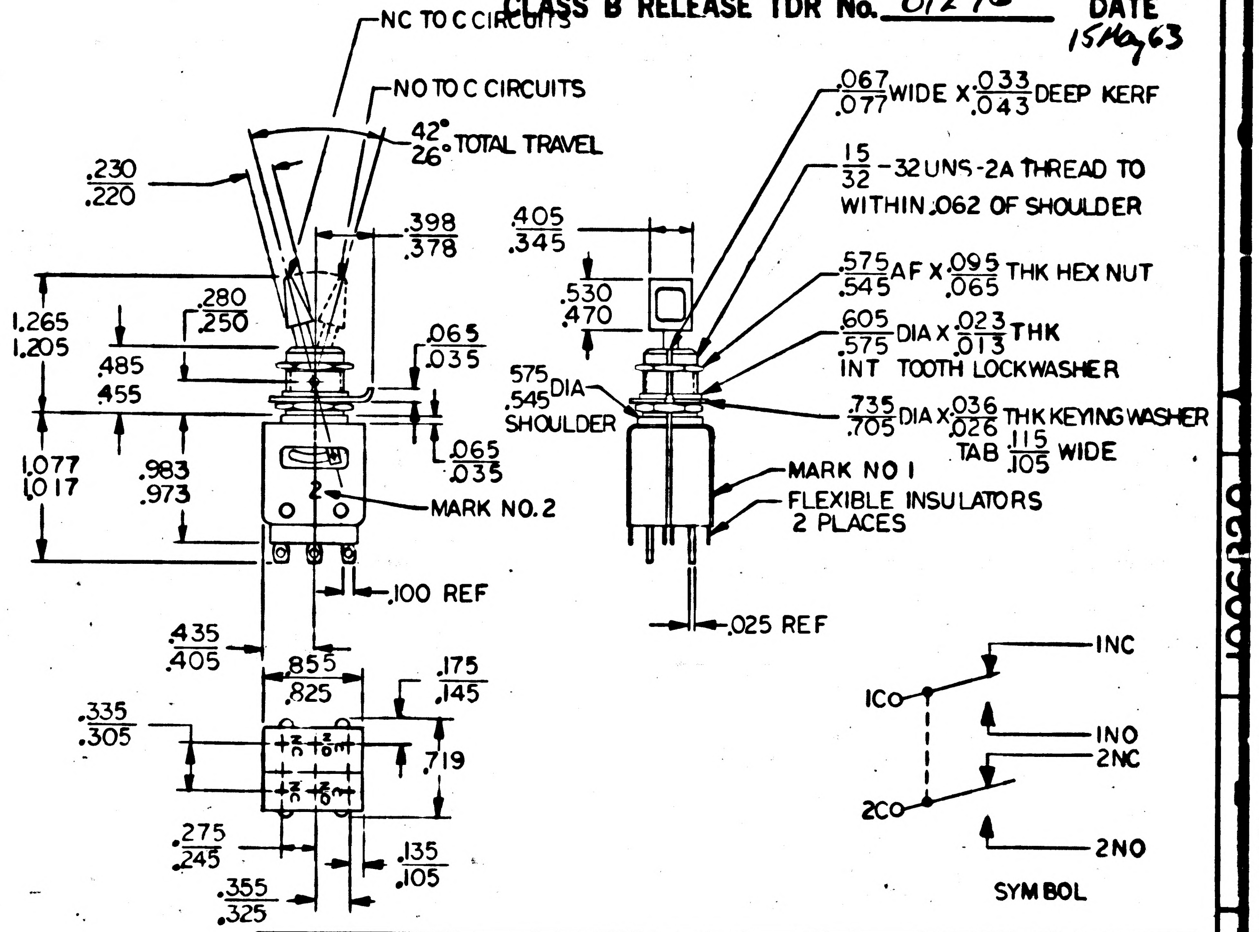
3. DESIGN:
   - A. TEMPERATURE RANGE: -300°F TO +250°F.
   - B. CONTACT RATING:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
       RESISTIVE: 5 AMPERES.
       INDUCTIVE: 3 AMPERES.
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
       RESISTIVE: 5 AMPERES.
       INDUCTIVE: 3 AMPERES.
     - (3) INRUSH CURRENT: 24 AMPERES.
   - C. ENDURANCE: 25,000 CYCLES, MINIMUM.
   - D. STRENGTH OF ACTUATOR: 25 POUNDS.
   - E. STRENGTH OF TERMINALS: 5 POUNDS.
   - F. CONTACT VOLTAGE DROP: ONE (1) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - G. HANDLE: ALUMINUM.
   - H. SENSITIVE SWITCHES: SHALL BE HERMETICALLY SEALED.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01276 **DATE** 15May63


NC TO C CIRCUITS
NO TO C CIRCUITS
42° / 26° TOTAL TRAVEL
.230 / .220
.398 / .378
.280 / .250
1.265 / 1.205
.485 / .455
.065 / .035
.065 / .035
1.077 / 1.017
.983 / .973
MARK NO. 2
.100 REF
.435 / .405
.855 / .825
.175 / .145
.335 / .305
.719
.275 / .245
.135 / .105
.355 / .325
.405 / .345
.530 / .470
.575 / .545 DIA SHOULDER
.067 / .077 WIDE X .033 / .043 DEEP KERF
15/32 -32 UNS-2A THREAD TO WITHIN .062 OF SHOULDER
.575 / .545 AF X .095 / .065 THK HEX NUT
.605 / .575 DIA X .023 / .013 THK INT TOOTH LOCKWASHER
.735 / .705 DIA X .036 / .026 THK KEYING WASHER TAB .115 / .105 WIDE
MARK NO 1
FLEXIBLE INSULATORS 2 PLACES
.025 REF
1NC
1CO
1NO
2NC
2CO
2NO
SYMBOL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Tony Killeen DATE 1 APR 63
CHECKED A. Yelang 30 APR 63
APPROVAL
APPROVAL Eldon C Hall 8 May 63
NASA APPROVAL 5/15/63
MIT APPROVAL 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006820
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006821

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-6743, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNITS SHALL BE MARKED PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

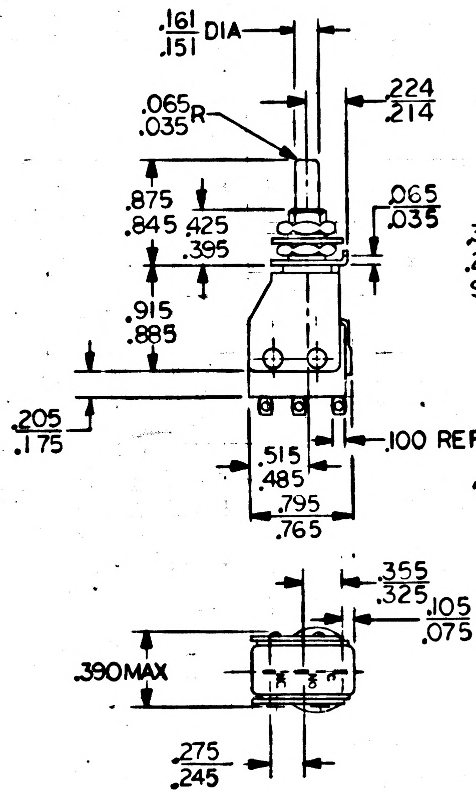
2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: SHALL BE PLATED FOR SOLDERING. CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: SINGLE POLE DOUBLE THROW.
   - C. INSULATION: 1000 VOLTS RMS, 60 CYCLES.
   - D. ACTUATING FORCE: 5 ± 1 OUNCES.
   - E. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:
   - A. TEMPERATURE RANGE: -300°F TO +250°F.
   - B. CONTACT RATINGS:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
       RESISTIVE: 5 AMPERES.
       INDUCTIVE: 3 AMPERES.
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
       RESISTIVE: 5 AMPERES.
       INDUCTIVE: 3 AMPERES.
     - (3) INRUSH CURRENT: 24 AMPERES.
   - C. MINIMUM OPERATING CYCLES: 25,000.
   - D. STRENGTH OF ACTUATOR: 25 POUNDS.
   - E. STRENGTH OF TERMINALS: 5 POUNDS.
   - F. CONTACT VOLTAGE DROP: ONE (1) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - G. SENSITIVE SWITCHES: SHALL BE HERMETICALLY SEALED.

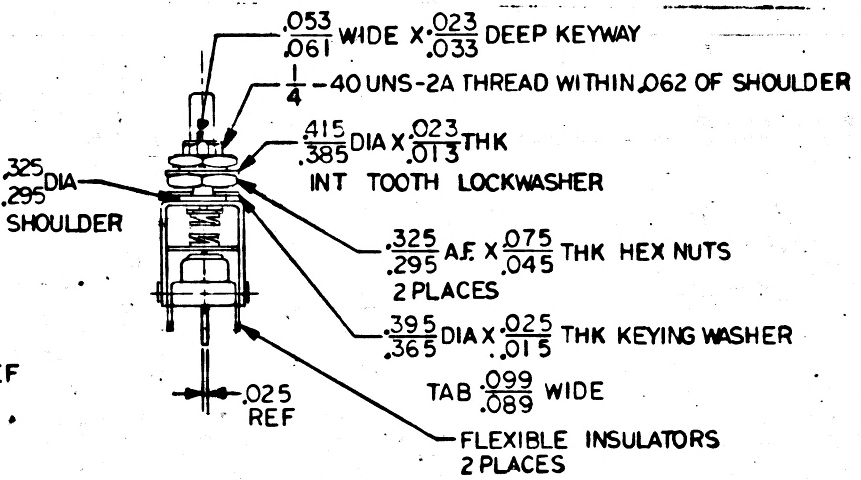
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY

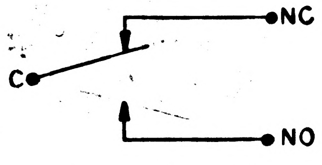
CLASS B RELEASE TDR No. 01276 DATE 15 May 63



.161/.151 DIA
.224/.214
.065/.035 R
.875/.845
.425/.395
.065/.035
.915/.885
.205/.175
.100 REF
.515/.485
.795/.765
.355/.325
.105/.075
.390 MAX
.275/.245



.053/.061 WIDE X .023/.033 DEEP KEYWAY
1/4-40 UNS-2A THREAD WITHIN .062 OF SHOULDER
.415/.385 DIA X .023/.013 THK
INT TOOTH LOCKWASHER
.325/.295 DIA
SHOULDER
.325/.295 A.F. X .075/.045 THK HEX NUTS
2 PLACES
.395/.365 DIA X .025/.015 THK KEYING WASHER
TAB .099/.089 WIDE
.025 REF
FLEXIBLE INSULATORS
2 PLACES



SYMBOL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 5 APR 63
CHECKED 30 APR 63
APPROVAL
APPROVAL Eldon C. Hall 8 May 63
NASA APPROVAL 5/10/63
MIT APPROVAL 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006821

SCALE NONE WT SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006826 A

REVISIONS 01768			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 04908	12/10/63	EPR

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: REELS OR SPOOLS AND UNIT PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, PART NUMBER, ITEM DESCRIPTION, LENGTH AND WIDTH, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND DATE OF EXPIRATION.
2. ACCEPTANCE AND INSPECTION: (SAMPLE)
   - A. MECHANICAL PROPERTIES:
     - (1) THICKNESS WITH ADHESIVE, LESS PROTECTIVE COVERING: 0.0075 PLUS OR MINUS 0.0005 INCH.
     - (2) LENGTH: 1010 FEET PLUS 1 FOOT MINUS ZERO.
3. DESIGN:
   - A. MECHANICAL PROPERTIES:
     - (1) ADHESIVE STRENGTH: 25 POUNDS PER SQUARE INCH MINIMUM.
     - (2) ELONGATION AT BREAK: 400 PERCENT.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) VOLTAGE STRENGTH: 400 VOLTS PER MIL MINIMUM.
     - (2) RESISTIVITY: 7×10^{12} OHMS PER CUBIC CENTIMETER.
     - (3) DIELECTRIC CONSTANT: 2.05 AT 1 KILOCYCLE.
   - C. THIS TAPE SHALL CONSIST OF A MYLAR BASE WITH AN ADHESIVE COATING ON ONE SIDE PROTECTED WITH A REMOVABLE PROTECTIVE COVERING.
   - D. STORAGE LIFE: THIS TAPE SHALL SHOW NO EVIDENCE OF DETERIORATION AFTER STORAGE FOR ONE YEAR MINIMUM AT 77 DEGREES FAHRENHEIT.

DASH NO.	WIDTH
-1	1.500 ± .005
-2	0.600 ± .005
-3	0.290 ± .010
-4	0.800 ± .005
-5	1.400 ± .005
-6	1.650 ± .010
-7	0.250 ± .005
-8	0.400 ± .010
-9	0.340 ± .010
-10	1.000 ± .010
-11	.700 ± .005
-12	.140 ± .010

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 19 June 63
CHECKED 19 June 63
APPROVAL
APPROVAL Eldon C Hall 24 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
PRESSURE SENSITIVE ADHESIVE
(MYLAR)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006826
SCALE NONE
WT
SHEET 1 OF 1

1006826 A

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006826

REVISIONS 01768			
SYM	DESCRIPTION	DATE	APPROVAL
—			

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: REELS OR SPOOLS AND UNIT PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, PART NUMBER, ITEM DESCRIPTION, LENGTH AND WIDTH, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER AND DATE OF EXPIRATION.

2. ACCEPTANCE AND INSPECTION: (SAMPLE)

   A. MECHANICAL PROPERTIES:

      (1) THICKNESS WITH ADHESIVE, LESS PROTECTIVE COVERING: 0.0075 PLUS OR MINUS 0.0005 INCH.

      (2) LENGTH: 1010 FEET PLUS 1 FOOT MINUS ZERO.

3. DESIGN:

   A. MECHANICAL PROPERTIES:

      (1) ADHESIVE STRENGTH: 25 POUNDS PER SQUARE INCH MINIMUM.

      (2) ELONGATION AT BREAK: 400 PERCENT.

   B. ELECTRICAL CHARACTERISTICS:

      (1) VOLTAGE STRENGTH: 400 VOLTS PER MIL MINIMUM.

      (2) RESISTIVITY: 7×10^{12} OHMS PER CUBIC CENTIMETER.

      (3) DIELECTRIC CONSTANT: 2.05 AT 1 KILOCYCLE.

   C. THIS TAPE SHALL CONSIST OF A MYLAR BASE WITH AN ADHESIVE COATING ON ONE SIDE PROTECTED WITH A REMOVABLE PROTECTIVE COVERING.

   D. STORAGE LIFE: THIS TAPE SHALL SHOW NO EVIDENCE OF DETERIORATION AFTER STORAGE FOR ONE YEAR MINIMUM AT 77 DEGREES FAHRENHEIT.

DASH NO.	WIDTH
-1	1.500 ± .005
-2	0.600 ± .005
-3	0.290 ± .010
-4	0.800 ± .005
-5	1.400 ± .005
-6	1.650 ± .010
-7	0.250 ± .005
-8	0.400 ± .010
-9	0.340 ± .010
-10	1.000 ± .010
-11	.700 ± .005

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [illegible] DATE 19 June 63
CHECKED [illegible] 19 June 63
APPROVAL
APPROVAL Elden C Hall 24 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
PRESSURE SENSITIVE ADHESIVE
(MYLAR)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006826
SCALE NONE | WT | SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006826

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1006827 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REPLACED BY REV B WITH CHANGES PER TDRR - 02738	8/21/63	DW

④

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. PART SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS, EXCEPTIONS OR SUBSTITUTIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 1.
   - D. PART SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A, IN BOTH INSTANCES. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19471 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.
   - F. MARKING: MARK EACH PART PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, DATE CODE, LOT CODE AND SERIAL NUMBER.
2. ACCEPTANCE AND INSPECTION
   - A. LEAD DATA: PER NASA DOCUMENT 1015402. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS: PER TABLE II.
     - (1) BREAKDOWN VOLTAGE; BV_{EBO}, BV_{CBO}, $LV_{CEO}(SUST)$
     - (2) CUTOFF CURRENT; I_{CBO}, I_{CEO}, I_{EBO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO; hFE_1, hFE_4
     - (4) SATURATION VOLTAGE; $V_{CE(sat)_1}$, $V_{BE(sat)_1}$
     - (5) VOLTAGE, BASE-EMITTER; V_{BE}
   - C. MARKING: SEE PARAGRAPH 1F.
3. DESIGN:

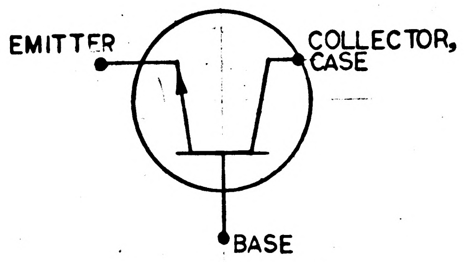
STORAGE TEMPERATURE (T_{stg}): -65° TO +200°C.
JUNCTION OPERATING TEMPERATURE (T_J): +200°C MAXIMUM.
ELECTRICAL RATINGS: PER TABLE I.
ELECTRICAL CHARACTERISTICS: PER TABLE II.
POWER DISSIPATION:
AT +100°C CASE TEMPERATURE: 40.0 WATTS.
THERMAL RESISTANCE (θ_{JC}): 2.5°C/WATT

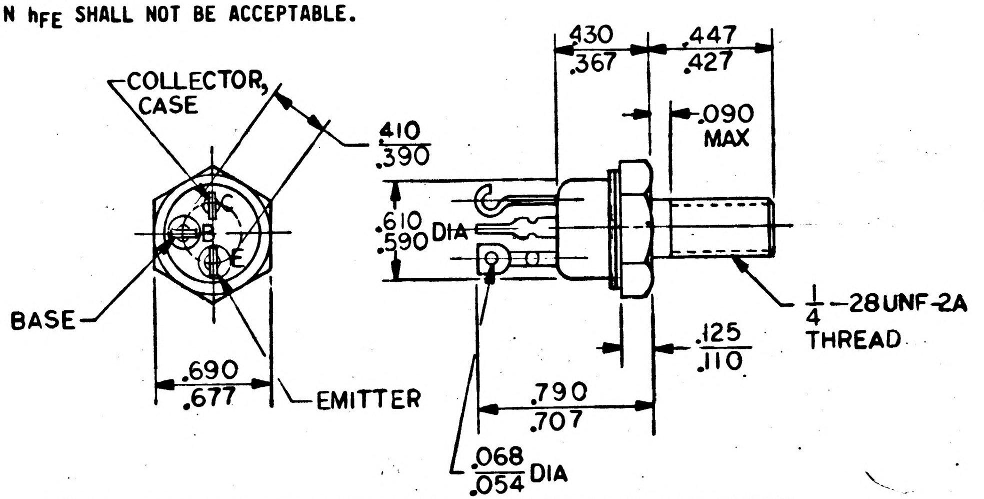
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

4. SPECIAL CONDITIONING (BY SUPPLIER):
   - A. BURN-IN: PARTS SHALL BE BURNED-IN AT THE FOLLOWING CONDITIONS:
     - (1) AMBIENT TEMPERATURE, T_C = +100° ± 5°C.
     - (2) COLLECTOR VOLTAGE, V_{CB} = +60 VOLTS DC, MINIMUM.
     - (3) POWER DISSIPATION: 20 WATTS ± 10 PERCENT (T_J = +150°C)
     - (4) TIME, t = 240 HOURS, MINIMUM.
   - B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:
     - (1) COLLECTOR CUTOFF CURRENT, I_{CBO}
     - (2) EMITTER CUTOFF CURRENT, I_{EBO}
     - (3) COLLECTOR CUTOFF CURRENT, I_{CEX}(+150°C)
     - (4) COLLECTOR SATURATION VOLTAGE, $V_{CE}(sat)_2$
     - (5) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_2
   - C. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL TRANSISTOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR HAVE CHANGED MORE THAN 10% IN h_{FE} SHALL NOT BE ACCEPTABLE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01275 **DATE** 15 May 63





Ⓐ REPLACED BY REV B WITH CHANGES

A	A
-	-
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN H. Prussian DATE 1 MAY 63
CHECKED W. J. Gifford 6 MAY 63
APPROVAL
APPROVAL Eldon C Hall 5-15-63
NASA APPROVAL 5/15/63
MIT APPROVAL 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, NPN, SILICON, POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006827
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006827 A

SYM	DESCRIPTION	DATE	APPROVAL
A	REPLACED BY REV B WITH CHANGES PER TDRR 02738	1/21/63	

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TABLE I

MANUFACTURER'S ABSOLUTE MAXIMUM RATINGS TC = +25°C

COLLECTOR CURRENT (I_C)	COLLECTOR VOLTAGE (V_{CB})	EMITTER VOLTAGE (V_{EB})	COLLECTOR VOLTAGE (V_{CE})	COLLECTOR POWER DISSIPATION	MANUFACTURER'S TYPE DESIGNATION
A	V_{DC}	V_{DC}	V_{DC}	W	
10	120	8	80	40	TO BE ASSIGNED

TABLE II

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS MIN	MAX	UNIT
BREAKDOWN VOLTAGE, COLLECTOR-BASE	I_C=10UA, I_E=0	BV_{CBO}	120	-	V_{DC}
BREAKDOWN VOLTAGE, EMITTER-BASE	I_E=10UA, I_C=0	BV_{EBO}	8	-	V_{DC}
BREAKDOWN VOLTAGE, COLLECTOR-EMITTER	I_C=10MA, I_B=0	BV_{CEO}	80	-	V_{DC}
SUSTAINING VOLTAGE, COLLECTOR-EMITTER	I_C=100MA, I_B=0 ▷1	LV_{CEO}	70	-	V_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CB}=60V, I_E=0	I_{CBO}	-	100	NA_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CE}=60V, V_{BE}=0.5V, T_C=+150°C	I_{CEX}	-	100	UA_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CE}=50V, I_B=0,	I_{CEO}	-	100	UA_{DC}
CUTOFF CURRENT, EMITTER	V_{EB}=8V, I_C=0,	I_{EBO}	-	10	UA_{DC}
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=10MA	hFE_1	10	-	-
	V_{CE}=5V, I_C=5A ▷1	hFE_2	20	60	-
	V_{CE}=5V, I_C=5A, T_C=-55°C ▷1	hFE_3	10	-	-
	V_{CE}=5V, I_C=10A ▷1	hFE4	15	-	-
SATURATION VOLTAGE, COLLECTOR-EMITTER	I_C=5A, I_B=500MA ▷1	$V_{CE}(sat)_1$	-	0.5	V_{DC}
	I_C=10A, I_B=1A ▷1	$V_{CE}(sat)_2$	-	1.5	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=5A, I_B=500MA ▷1	$V_{BE}(sat)_1$	-	1.2	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=10A, I_B=1A ▷1	$V_{BE}(sat)_2$	-	2.0	V_{DC}
VOLTAGE, BASE-EMITTER	V_{CE}=5V, I_C=5A ▷1	V_{BE}	-	1.2	V_{DC}
SMALL-SIGNAL, SHORT-CIRCUIT, FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=50MA, f=1KC	hfe	20	75	-
	V_{CE}=10V, I_C=1A, f=10MC	|hfe|	1.5	-	-
OUTPUT CAPACITANCE	V_{CB}=10V, I_C=0, f=1MC	Cob	-	350	pf

▷1 PULSE CONDITIONS: WIDTH $\leq$ 330 MICROSECONDS; DUTY CYCLE $\leq$ 2%.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01275 **DATE** 15 May 63

Ⓐ REPLACED BY REV B WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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DRAWN H. Lumier DATE 4 MAY 63
CHECKED W. J. Gifford A. Yelag 6 MAY 63
APPROVAL
APPROVAL Eldon C Hall 5-15-63
NASA APPROVAL 5/15/63
MIT APPROVAL W. Kupfer 15 May 63

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HOUSTON, TEXAS

TRANSISTOR,
NPN, SILICON, POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006827
SCALE NONE WT SHEET 2 OF 2

1006827

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006827 C

REVISIONS

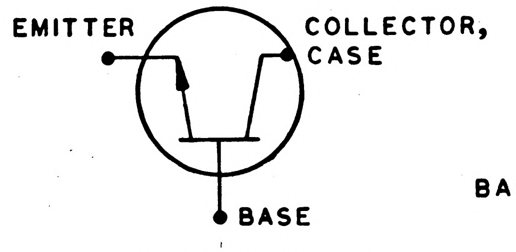
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A PER TDRR 02738 W. Maynard	8/21/63	
C	REVISED PER TDRR 04907	12/10/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THE PART SHALL MEET APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THE PART SHALL BE CAPABLE OF MEETING QUALIFICATION REQUIREMENTS OF ND1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A, IN BOTH INSTANCES.
2. ACCEPTANCE AND INSPECTION:
   - A. LEAD MATERIAL: IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH ND 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. DIMENSIONS: AS SPECIFIED HEREIN. SAMPLE SHALL BE IN ACCORDANCE WITH MIL-STD-105C, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.
   - C. ELECTRICAL CHARACTERISTICS: AS SPECIFIED IN TABLE I. THE FOLLOWING CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED.
     - (1) BREAKDOWN VOLTAGE: BV_{EBO}, BV_{CBO}, $LV_{CEO}(SUST)$
     - (2) CUTOFF CURRENT: I_{CBO}, I_{CEO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO: hFE_2, hFE_4
     - (4) SATURATION VOLTAGE: $V_{CE}(SAT)_1$, $V_{BE}(SAT)_1$
   - D. MARKING: SAMPLE PER MIL-STD-105C, LEVEL I, AQL OF 4.0 PERCENT.
     - (1) UNITS SHALL BE MARKED PER MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER, MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION AND LOT IDENTIFICATION.
     - (2) UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER, THE MANUFACTURER'S NAME, LOT NUMBER AND DATE OF MANUFACTURE.
   - E. EACH UNIT SHALL BE SUPPLIED WITH THE FOLLOWING HARDWARE: ONE NICKEL PLATED BRASS HEXAGON NUT, ONE MICA WASHER AND ONE PLASTIC BUSHING. HARDWARE CONFIGURATION SHALL BE AS SHOWN HEREIN. SAMPLE PER MIL-STD-105C, LEVEL I, AQL OF 4.0 PERCENT.
3. DESIGN:
   - A. ABSOLUTE MAXIMUM RATINGS:
     - (1) STORAGE TEMPERATURE (Tstg): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.
     - (2) JUNCTION OPERATING TEMPERATURE (T_J): PLUS 200 DEGREES CENTIGRADE.
     - (3) POWER DISSIPATION:
       - (a) AT PLUS 100 DEGREES CENTIGRADE CASE TEMPERATURE: 40.0 WATTS.
       - (b) THERMAL RESISTANCE (θ_{JC}): 2.5 DEGREES CENTIGRADE PER WATT.
     - (4) COLLECTOR TO EMITTER VOLTAGE (V_{CE}): 80 VOLTS DC.
     - (5) BASE TO EMITTER VOLTAGE (V_{BE}): 8 VOLTS DC.
     - (6) COLLECTOR TO BASE VOLTAGE(V_{CB}): 120 VOLTS DC.
     - (7) COLLECTOR CURRENT (I_C): 10 AMPERES.
   - B. MOUNTING: STUD SHALL BE CAPABLE OF WITHSTANDING A TORQUE OF 12 INCH-POUNDS MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

Ⓑ REPLACES REV A WITH CHANGES



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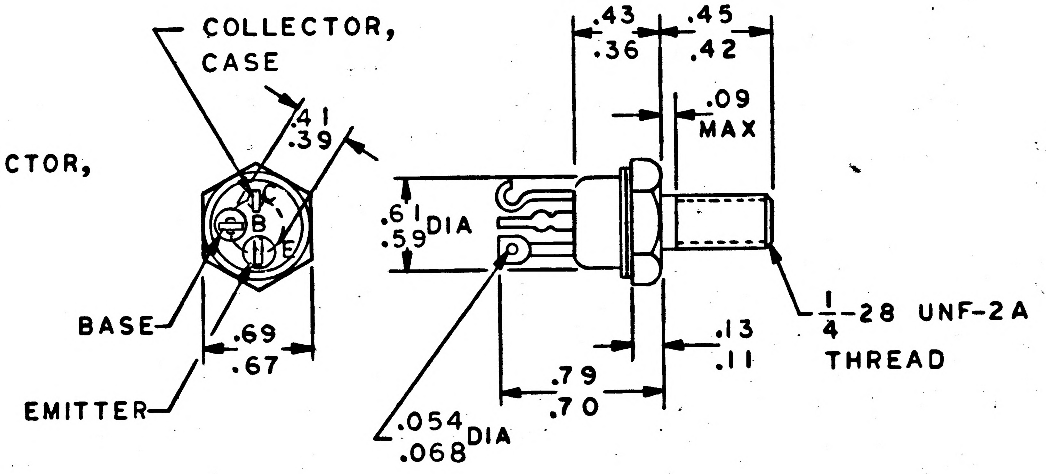

MASTER

C	B	
B	B	
SHEET 1	SHEET 2	
REVISION STATUS OF SHEETS		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 8 Aug 63
CHECKED J. Ruggeri / H. Maynard 8 Aug 63
APPROVAL
APPROVAL Eldon C Hall 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, NPN, SILICON, POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006827
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

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1006827 D

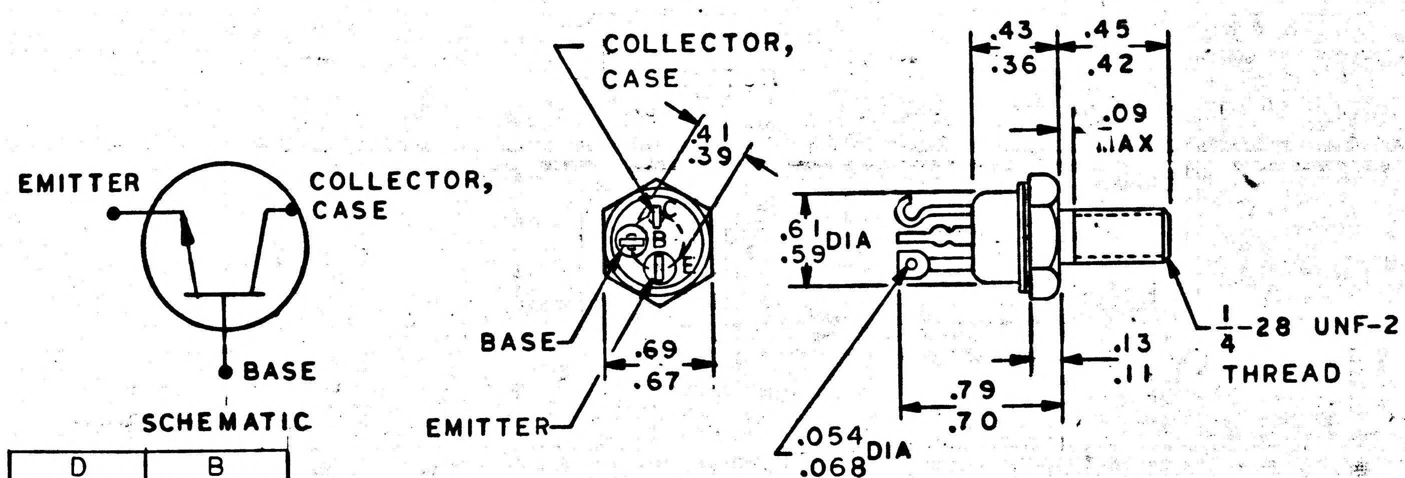
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A PER TDRR 02738 W. Maynard	8/21/63	
C	REVISED PER TDRR 04907	12/10/63	
D	REVISED PER TDRR 05283	27 Dec 63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THE PART SHALL MEET APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THE PART SHALL BE CAPABLE OF MEETING QUALIFICATION REQUIREMENTS OF ND1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A, IN BOTH INSTANCES.
2. ACCEPTANCE AND INSPECTION:
   - A. LEAD MATERIAL: IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH ND 1015402. EXCEPT FOR DIMENSIONS A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. DIMENSIONS: AS SPECIFIED HEREIN. SAMPLE SHALL BE IN ACCORDANCE WITH MIL-STD-105C, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.
   - C. ELECTRICAL CHARACTERISTICS: AS SPECIFIED IN TABLE I. THE FOLLOWING CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED.
     - (1) BREAKDOWN VOLTAGE: BV_{EBO}, BV_{CBO}, $LV_{CEO}(SUST)$
     - (2) CUTOFF CURRENT: I_{CBO}, I_{CEO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO: hFE_2, hFE_4
     - (4) SATURATION VOLTAGE: $V_{CE}(SAT)_1$, $V_{BE}(SAT)_1$
   - D. MARKING: SAMPLE PER MIL-STD-105C, LEVEL I, AQL OF 4.0 PERCENT.
     - (1) UNITS SHALL BE MARKED PER MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER, MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION AND LOT IDENTIFICATION.
     - (2) UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER, THE MANUFACTURER'S NAME, LOT NUMBER AND DATE OF MANUFACTURE.
   - E. EACH UNIT SHALL BE SUPPLIED WITH THE FOLLOWING HARDWARE: ONE NICKEL PLATED BRASS HEXAGON NUT, ONE MICA WASHER AND ONE PLASTIC BUSHING. HARDWARE CONFIGURATION SHALL BE AS SHOWN HEREIN. SAMPLE PER MIL-STD-105C, LEVEL I, AQL OF 4.0 PERCENT.
3. DESIGN:
   - A. ABSOLUTE MAXIMUM RATINGS:
     - (1) STORAGE TEMPERATURE (Tstg): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.
     - (2) JUNCTION OPERATING TEMPERATURE (T_J): PLUS 200 DEGREES CENTIGRADE.
     - (3) POWER DISSIPATION:
       - (a) AT PLUS 100 DEGREES CENTIGRADE CASE TEMPERATURE: 40.0 WATTS.
       - (b) THERMAL RESISTANCE (θ_{JC}): 2.5 DEGREES CENTIGRADE PER WATT.
     - (4) COLLECTOR TO EMITTER VOLTAGE (V_{CE}): 80 VOLTS DC.
     - (5) BASE TO EMITTER VOLTAGE (V_{BE}): 8 VOLTS DC.
     - (6) COLLECTOR TO BASE VOLTAGE(V_{CB}): 120 VOLTS DC.
     - (7) COLLECTOR CURRENT (I_C): 10 AMPERES.
   - B. MOUNTING: STUD SHALL BE CAPABLE OF WITHSTANDING A TORQUE OF 12 INCH-POUNDS MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

Ⓑ REPLACES REV A WITH CHANGES



D	B
C	B
B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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CHECKED J. Ruggeri / H. Maynard
APPROVAL
APPROVAL Eldon C Hall 8 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
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4 3 2 1

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1006827

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. PART SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS, EXCEPTIONS OR SUBSTITUTIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 1.

D. PART SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A, IN BOTH INSTANCES. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19471 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.

F. MARKING: MARK EACH PART PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, DATE CODE, LOT CODE AND SERIAL NUMBER.

2. ACCEPTANCE AND INSPECTION

A. LEAD DATA: PER NASA DOCUMENT 1015402. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

B. ELECTRICAL CHARACTERISTICS: PER TABLE II.

(1) BREAKDOWN VOLTAGE; BV_{EBO}, BV_{CBO}, $LV_{CEO}(SUST)$

(2) CUTOFF CURRENT; I_{CBO}, I_{CEO}, I_{EBO}

(3) STATIC FORWARD CURRENT TRANSFER RATIO; hFE_1, hFE_4

(4) SATURATION VOLTAGE; $V_{CE(sat)1}$, $V_{BE(sat)1}$

(5) VOLTAGE, BASE-EMITTER; V_{BE}

C. MARKING: SEE PARAGRAPH 1F.

3. DESIGN:

STORAGE TEMPERATURE (T_{stg}): -65° TO +200°C.

JUNCTION OPERATING TEMPERATURE (T_J): +200°C MAXIMUM.

ELECTRICAL RATINGS: PER TABLE I.

ELECTRICAL CHARACTERISTICS: PER TABLE II.

POWER DISSIPATION:

AT +100°C CASE TEMPERATURE: 40.0 WATTS.

THERMAL RESISTANCE (θ_{JC}): 2.5°C/WATT

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

4. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: PARTS SHALL BE BURNED-IN AT THE FOLLOWING CONDITIONS:

(1) AMBIENT TEMPERATURE, T_C = +100° ± 5°C.

(2) COLLECTOR VOLTAGE, V_{CB} = +60 VOLTS DC, MINIMUM.

(3) POWER DISSIPATION: 20 WATTS ± 10 PERCENT (T_J = +150°C)

(4) TIME, t = 240 HOURS, MINIMUM.

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:

(1) COLLECTOR CUTOFF CURRENT, I_{CBO}

(2) EMITTER CUTOFF CURRENT, I_{EBO}

(3) COLLECTOR CUTOFF CURRENT, $I_{CEX}(+150°C)$

(4) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)2}$

(5) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_2

C. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL TRANSISTOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR HAVE CHANGED MORE THAN 10% IN h_{FE} SHALL NOT BE ACCEPTABLE.

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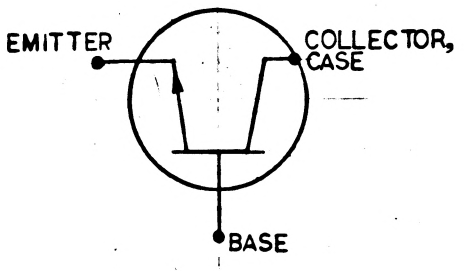

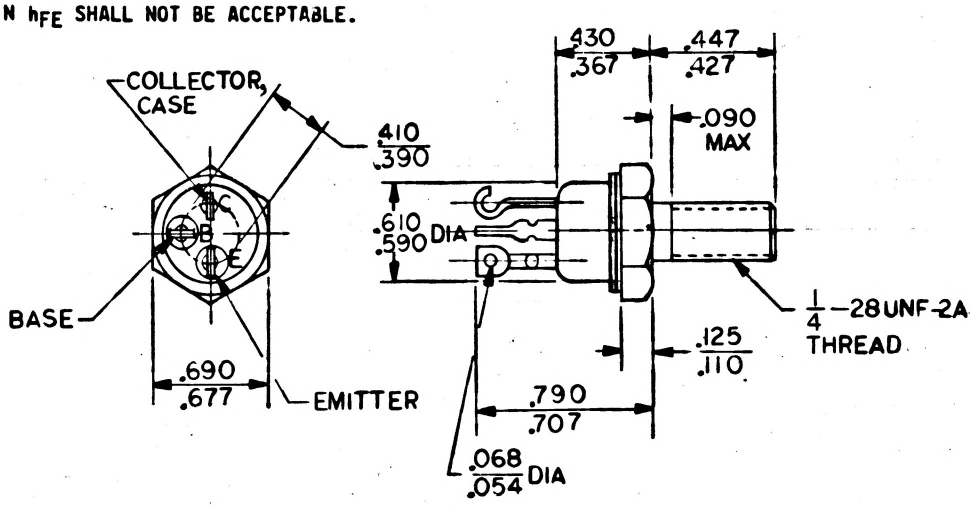

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SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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APPROVAL Eldon C Hall 5-15-63
NASA APPROVAL [illegible] 5/15/63
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SIZE C
NASA DRAWING NO. 1006827
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TABLE I

MANUFACTURER'S ABSOLUTE MAXIMUM RATINGS TC = +25°C					
COLLECTOR CURRENT (I_C)	COLLECTOR VOLTAGE (V_{CB})	EMITTER VOLTAGE (V_{EB})	COLLECTOR VOLTAGE (V_{CE})	COLLECTOR POWER DISSIPATION	MANUFACTURER'S TYPE DESIGNATION
A	V_{DC}	V_{DC}	V_{DC}	W	
10	120	8	80	40	TO BE ASSIGNED

TABLE II

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS MIN	MAX	UNIT
BREAKDOWN VOLTAGE, COLLECTOR-BASE	I_C=10UA, I_E=0	BV_{CBO}	120	-	V_{DC}
BREAKDOWN VOLTAGE, EMITTER-BASE	I_E=10UA, I_C=0	BV_{EBO}	8	-	V_{DC}
BREAKDOWN VOLTAGE, COLLECTOR-EMITTER	I_C=10MA, I_B=0	BV_{CEO}	80	-	V_{DC}
SUSTAINING VOLTAGE, COLLECTOR-EMITTER	I_C=100MA, I_B=0 [1]	LV_{CEO}	70	-	V_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CB}=60V, I_E=0	I_{CBO}	-	100	NA_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CE}=60V, V_{BE}=0.5V, T_C=+150°C	I_{CEX}	-	100	UA_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CE}=50V, I_B=0,	I_{CEO}	-	100	UA_{DC}
CUTOFF CURRENT, EMITTER	V_{EB}=8V, I_C=0,	I_{EBO}	-	10	UA_{DC}
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=10MA	hFE_1	10	-	-
	V_{CE}=5V, I_C=5A [1]	hFE_2	20	60	-
	V_{CE}=5V, I_C=5A, T_C=-55°C [1]	hFE_3	10	-	-
	V_{CE}=5V, I_C=10A [1]	hFE4	15	-	-
SATURATION VOLTAGE, COLLECTOR-EMITTER	I_C=5A, I_B=500MA [1]	$V_{CE}(sat)_1$	-	0.5	V_{DC}
	I_C=10A, I_B=1A [1]	$V_{CE}(sat)_2$	-	1.5	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=5A, I_B=500MA [1]	$V_{BE}(sat)_1$	-	1.2	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=10A, I_B=1A [1]	$V_{BE}(sat)_2$	-	2.0	V_{DC}
VOLTAGE, BASE-EMITTER	V_{CE}=5V, I_C=5A [1]	V_{BE}	-	1.2	V_{DC}
SMALL-SIGNAL, SHORT-CIRCUIT, FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=50MA, f=1KC	hfe	20	75	-
	V_{CE}=10V, I_C=1A, f=10MC	|hfe|	1.5	-	-
OUTPUT CAPACITANCE	V_{CB}=10V, I_C=0, f=1MC	Cob	-	350	pf

[1] PULSE CONDITIONS: WIDTH $\leq$ 330 MICROSECONDS; DUTY CYCLE $\leq$ 2%.

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CLASS B RELEASE TDR No. 01275 **DATE** 15 May 63

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HEAT TREATMENT NONE
FINAL FINISH NONE

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DWG. NO. CONTRACT

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CHECKED W. J. Gifford 6 MAY 63
APPROVAL
APPROVAL Eldon C Hall 5-15-63
NASA APPROVAL 5/15/63
MIT APPROVAL 15 May 63

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TRANSISTOR, NPN, SILICON, POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006827
SCALE NONE
WT
SHEET 2 OF 2

1006827

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1006829

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REPLACED BY REV B WITH CHANGES PER TDRR 02618	8/14/63	WK

(4)

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. PART SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS, EXCEPTIONS OR SUBSTITUTIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 1.

D. PART SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002051.

E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A, IN BOTH INSTANCES. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19471 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.

F. MARKING: MARK EACH PART PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, DATE CODE, LOT CODE AND SERIAL NUMBER.

2. ACCEPTANCE AND INSPECTION

A. LEAD DATA: PER NASA DOCUMENT 1015402. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

B. ELECTRICAL CHARACTERISTICS: PER TABLE II.

(1) BREAKDOWN VOLTAGE, BV_{CEO}

(2) BREAKDOWN VOLTAGE, BV_{CBO}

(3) COLLECTOR CUTOFF CURRENT, I_{CEX}

(4) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_1

(5) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)}$

(6) BASE SATURATION VOLTAGE, $V_{BE(sat)}$

C. MARKING: SEE PARAGRAPH 1F.

3. DESIGN:

STORAGE TEMPERATURE (T_{stg}): -65° TO +200°C.

JUNCTION OPERATING TEMPERATURE (T_J): +200°C MAXIMUM.

ELECTRICAL RATINGS: PER TABLE I.

ELECTRICAL CHARACTERISTICS: PER TABLE II.

POWER DISSIPATION, TOTAL:

AT +25°C CASE TEMPERATURE: 3.0 WATTS

THERMAL RESISTANCE (θ_{JC}): 58°C/WATT

AT +25°C AMBIENT TEMPERATURE: 800 MILLIWATTS

THERMAL RESISTANCE (θ_{JA}): 220°C/WATT

4. SPECIAL CONDITIONING (BY SUPPLIER):

A. BURN-IN: PARTS SHALL BE BURNED-IN AT THE FOLLOWING CONDITIONS:

(1) AMBIENT TEMPERATURE, T_A = +25° ± 5°C.

(2) COLLECTOR VOLTAGE, V_{CB} = -25 VOLTS DC, MINIMUM.

(3) POWER DISSIPATION: 365 MILLIWATTS ± 10 PERCENT (T_J = +105°C).

(4) TIME, t = 240 HOURS, MINIMUM.

B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:

(1) BREAKDOWN VOLTAGE, BV_{CEO}

(2) COLLECTOR CUTOFF CURRENT, I_{CEX}

(3) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)}$

(4) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_2

C. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL TRANSISTOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR HAVE CHANGED MORE THAN 10% IN hFE, SHALL NOT BE ACCEPTABLE.

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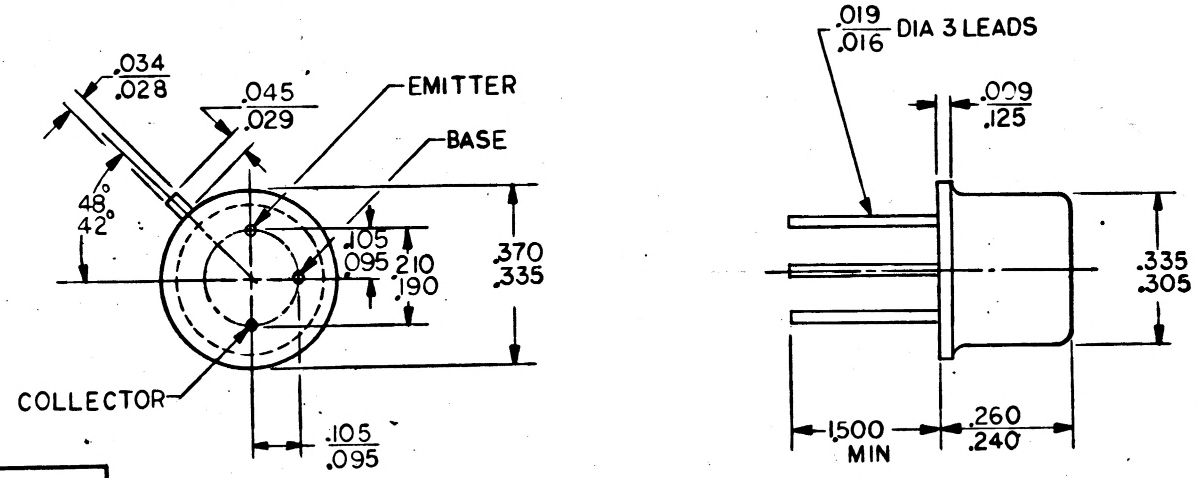

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SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

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FINAL FINISH NONE

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APPROVAL Eldon C Hall 5-15-63
NASA APPROVAL [illegible] 5/15/63
MIT APPROVAL W Kupfer 15 May 63

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SPECIFICATION CONTROL DRAWING

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SIZE C
NASA DRAWING NO. 1006829
SCALE NONE
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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CLASS B RELEASE TDR No. 01275 DATE 15 May 63

TABLE I

MANUFACTURER'S ABSOLUTE MAXIMUM RATINGS TC = +25°C					
COLLECTOR CURRENT (I_C)	COLLECTOR VOLTAGE (V_{CB})	EMITTER VOLTAGE (V_{EB})	COLLECTOR VOLTAGE (V_{CE})	COLLECTOR POWER DISSIPATION	MANUFACTURER'S TYPE DESIGNATION
MA	V_{DC}	V_{DC}	V_{DC}	W	
-800	-50	-5	-50	3.0	TO BE ASSIGNED

TABLE II

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)					
PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS		
			MINIMUM	MAXIMUM	UNIT
COLLECTOR-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{CEX}	-	-100	NADC
BASE-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{BEX}	-	-100	NADC
COLLECTOR-BASE BREAKDOWN VOLTAGE	I_C=-10UA, I_E= 0	BV_{CBO}	-50	-	VDC
COLLECTOR-EMITTER BREAKDOWN VOLTAGE	I_C=-100MA, I_B=0	BV_{CEO}	-50	-	VDC
EMITTER-BASE BREAKDOWN VOLTAGE	I_E=-100UA, I_C=0	BV_{EBO}	-5	-	VDC
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=-10V, I_C=-0.1MA	hFE_1	30	-	-
	V_{CE}=-10V, I_C=-150MA, ▷	hFE_2	75	225	-
	V_{CE}=-1V, I_C=-150MA ▷	hFE_3	30	-	-
	V_{CE}=-10V, I_C=-500MA ▷	hFE_4	40	-	-
COLLECTOR-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	V_{CE} (sat)	-	-0.4	VDC
	I_C=-500MA, I_B=-50MA		-	-1.2	VDC
BASE-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	V_{BE} (sat)	-	-1.3	VDC
	I_C=-500MA, I_B=-50MA		-	-1.8	VDC
OUTPUT CAPACITANCE	V_{CB}=-10V, I_E=0, f=100KC	Cob	-	25	pf
CURRENT GAIN BANDWIDTH PRODUCT	I_C=-50MA, V_{CE}=-10V, f=100MC	f_T	120	-	MC
DELAY TIME	CIRCUIT PER FIGURE 1	t_d	-	15	nSEC
RISE TIME	CIRCUIT PER FIGURE 1	t_r	-	45	nSEC
STORAGE TIME	CIRCUIT PER FIGURE 2	t_s	-	225	nSEC
FALL TIME	CIRCUIT PER FIGURE 2	t_f	-	45	nSEC

▷ PULSE CONDITIONS: WIDTH ≤ 300 USEC; DUTY CYCLE ≤ 2%.

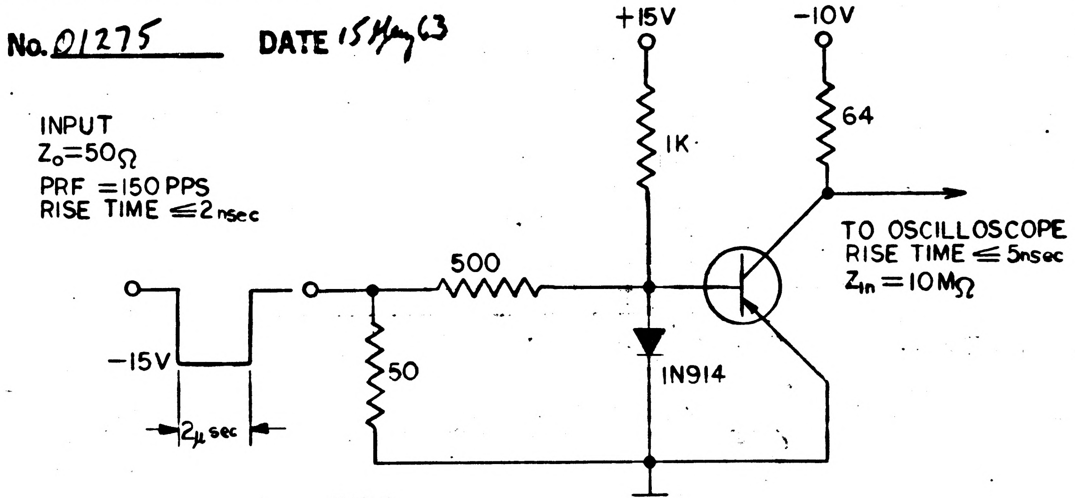

FIG. 1

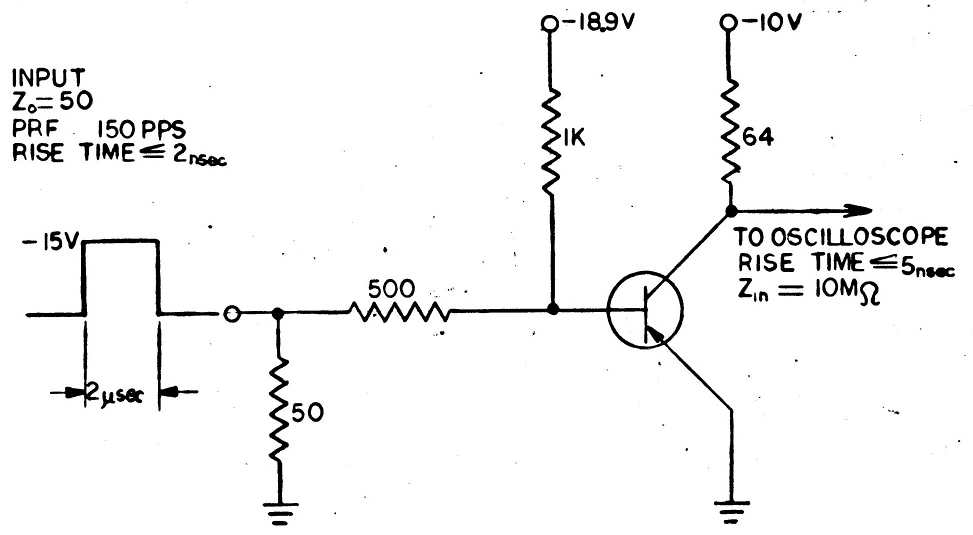

FIG. 2

Ⓐ REPLACED BY REV B WITH CHANGES

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LIST OF MATERIALS			

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DRAWN B Plumier DATE 1MAY63
CHECKED J. Ruggiero A Yelang 1MAY63
APPROVAL
APPROVAL Eldon C Hall 5-15-63
NASA APPROVAL 5/15/63
MIT APPROVAL W Kupfer 15 May 63

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TRANSISTOR, PNP, SILICON
(SWITCHING)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006829
SCALE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
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1006829

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1006829 B

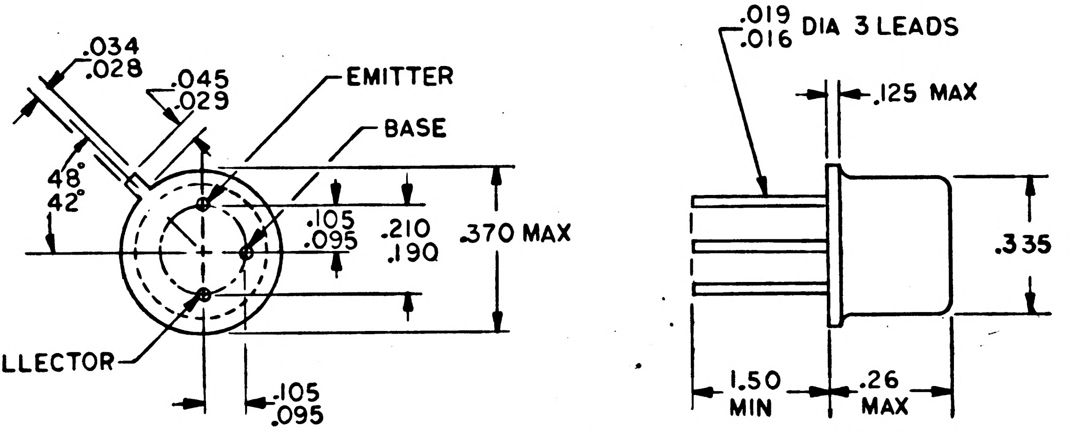
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGE AND UPGRADED TO CLASS A PER TDRR 02618. CHK J. Ruggeri APPD	8/14/63	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A IN BOTH INSTANCES. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19491 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:
   - A. LEAD MATERIAL: IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. DIMENSIONS: AS SPECIFIED HEREIN. SAMPLE PER MIL-STD-10 , INSPECTION LEVEL I, AQL OF 4.0 PERCENT.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I. 100 PERCENT INSPECTION.
     - (1) BREAKDOWN VOLTAGE, BV_{CEO}, BV_{CBO}, BV_{EBO}
     - (2) COLLECTOR CUTOFF CUTTENT, I_{CEX}, I_{CBO}, I_{CEO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_2, hFE_3, hFE_4
     - (4) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)1}$, $V_{BE(sat)1}$
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, TERMINAL IDENTIFICATION, LOT CODE IDENTIFICATION AND NASA DRAWING NUMBER AND REVISION LETTER. SAMPLE PER MIL-STD-10 , INSPECTION LEVEL I, AQL OF 4.0 PERCENT.

3. DESIGN:
   - A. ABSOLUTE MAXIMUM RATINGS:
     - (1) STORAGE TEMPERATURE (T_{stg}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.
     - (2) JUNCTION OPERATING TEMPERATURE (T_j): PLUS 200 DEGREES CENTIGRADE.
     - (3) POWER DISSIPATION (TOTAL):
       - (a) AT PLUS 25 DEGREES CENTIGRADE CASE TEMPERATURE: 3.0 WATTS. THERMAL RESISTANCE (θ_{JC}): 58 DEGREES CENTIGRADE PER WATT.
       - (b) AT PLUS 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE: 800 MILLIWATTS. THERMAL RESISTANCE (θ_{JA}): 220 DEGREES CENTIGRADE PER WATT.
     - (4) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): -50 VOLTS DC.
     - (5) BASE-EMITTER VOLTAGE (V_{BEO}): -5 VOLTS DC.
     - (6) COLLECTOR-BASE VOLTAGE (V_{CBO}): -50 VOLTS DC.
     - (7) COLLECTOR CURRENT (I_C): 800 MILLIAMPERES.
   - B. CONSTRUCTION: THE SEMICONDUCTOR MATERIAL SHALL BE PNP SILICON AND THE DEVICE SHALL BE HERMETICALLY SEALED IN A METAL CASE.



Ⓑ REPLACES REV A WITH CHANGE

MASTER

B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 31 July 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL Eldon C Hall 14 Aug 63
NASA APPROVAL W J Rhine 8-14-63
MIT APPROVAL [illegible] 14 Aug 63

MANNED SPACECRAFT CENTER
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006829
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGE AND UPGRADED TO CLASS A PER TDRR 02618 A. Maynard CHK J Ruggeri APPD	8/14/63	WK

TABLE I

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS		
			MINIMUM	MAXIMUM	UNIT
COLLECTOR-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{CEX}	-	-100	NADC
BASE-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{BEX}	-	-100	NADC
COLLECTOR-BASE BREAKDOWN VOLTAGE	I_C=-10UA, I_E= 0	BV_{CBO}	-50	-	VDC
COLLECTOR-EMITTER BREAKDOWN VOLTAGE	I_C=-100MA, I_B=0	BV_{CEO}	-50	-	VDC
EMITTER-BASE BREAKDOWN VOLTAGE	I_E=-100UA, I_C=0	BV_{EBO}	-5	-	VDC
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=-10V, I_C=-0.1MA	hFE_1	30	-	-
	V_{CE}=-10V, I_C=-150MA NOTE 1	hFE_2	75	225	-
	V_{CE}=-1V, I_C=-150MA NOTE 1	hFE_3	30	-	-
	V_{CE}=-10V, I_C=-500MA NOTE 1	hFE_4	40	-	-
COLLECTOR-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	$V_{CE(SAT)_1}$	-	-0.4	VDC
	I_C=-500MA, I_B=-50MA	$V_{CE(SAT)_2}$	-	-1.2	VDC
BASE-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	$V_{BE(SAT)_1}$	-	-1.3	VDC
	I_C=-500MA, I_B=-50MA	$V_{BE(SAT)_2}$	-	-1.8	VDC
OUTPUT CAPACITANCE	V_{CB}=-10V, I_E=0, f=100KC	Cob	-	25	pf
CURRENT GAIN BANDWIDTH PRODUCT	I_C=-50MA, V_{CE}=-10V, f=100MC	f_T	120	-	MC
DELAY TIME	CIRCUIT PER FIGURE 1	t_d	-	15	nSEC
RISE TIME	CIRCUIT PER FIGURE 1	t_r	-	45	nSEC
STORAGE TIME	CIRCUIT PER FIGURE 2	t_s	-	225	nSEC
FALL TIME	CIRCUIT PER FIGURE 2	t_f	-	45	nSEC
CUTOFF CURRENT, COLLECTOR	V_{CB}=40V, I_E=0	I_{CBO}	-	-20	NADC
CUTOFF CURRENT, COLLECTOR	V_{CE}=40V, I_B=0	I_{CEO}	-	-20	NADC

NOTE 1 PULSE CONDITIONS: WIDTH ≤ 300 USEC; DUTY CYCLE ≤ 2%.

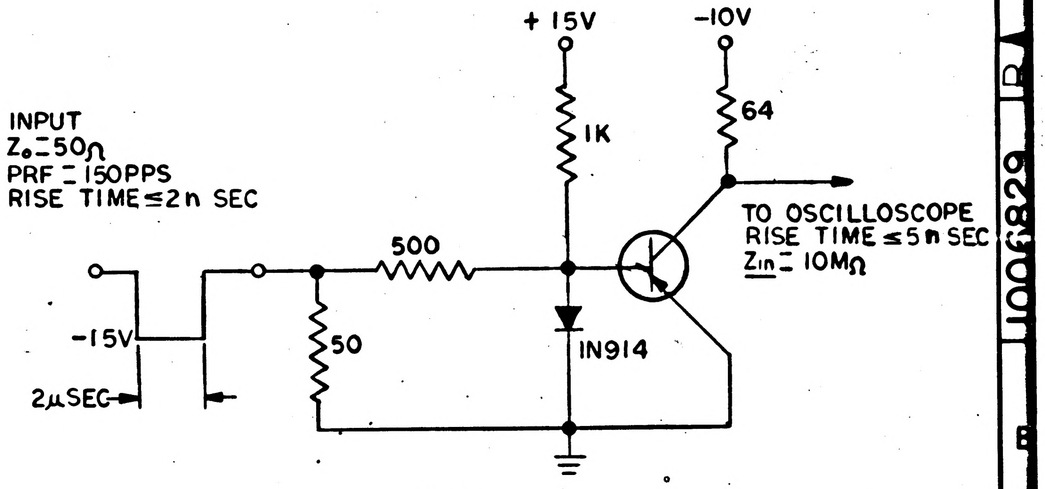

FIG. 1

Ⓑ REPLACES REV A WITH CHANGE

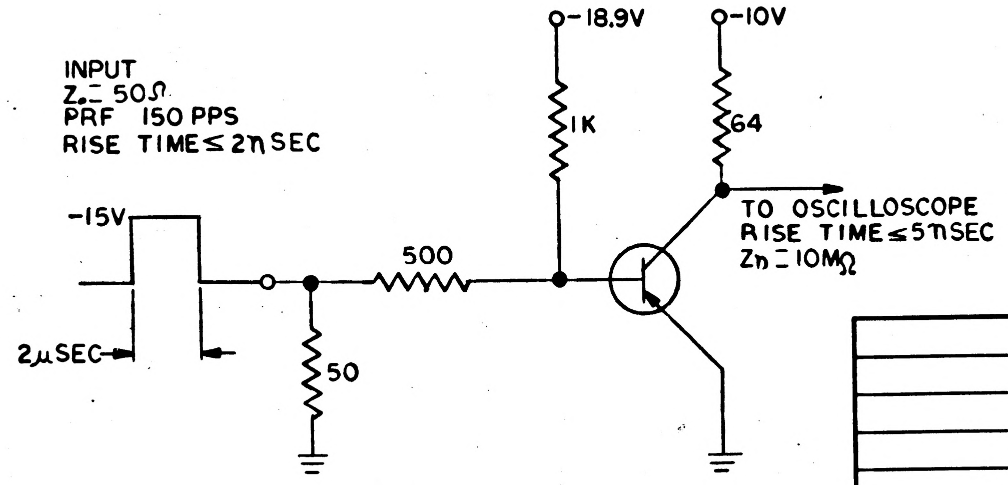

FIG. 2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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DWG. NO. CONTRACT
DRAWN R. Brunner DATE 3 Jan 63
CHECKED J. Ruggeri/A. Maynard
APPROVAL
APPROVAL Eldon C Hall 14 Aug 63
NASA APPROVAL W J Rhine 8-14-63
MIT APPROVAL 14 Aug 63

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SPECIFICATION CONTROL DRAWING

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SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
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C	1006829

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGE AND UPGRADED TO CLASS A PER TDRR 02618. H. Howard CHK J. Ruggeri APPD	8/14/63	W.W.
C	REVISED PER TDRR 04906	12/10/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN.
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   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002051.
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2. ACCEPTANCE AND INSPECTION:
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   - B. DIMENSIONS: AS SPECIFIED HEREIN. SAMPLE PER MIL-STD-10, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I. 100 PERCENT INSPECTION.
     - (1) BREAKDOWN VOLTAGE, BV_{CEO}, BV_{CBO}, BV_{EBO}
     - (2) COLLECTOR CUTOFF CUTTENT, I_{CEX}, I_{CBO}, I_{CEO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO, h_{FE_2}, h_{FE_3}, h_{FE_4}
     - (4) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)_1}$, $V_{BE(sat)_1}$
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, TERMINAL IDENTIFICATION, LOT CODE IDENTIFICATION AND NASA DRAWING NUMBER AND REVISION LETTER. SAMPLE PER MIL-STD-10, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.

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   - A. ABSOLUTE MAXIMUM RATINGS:
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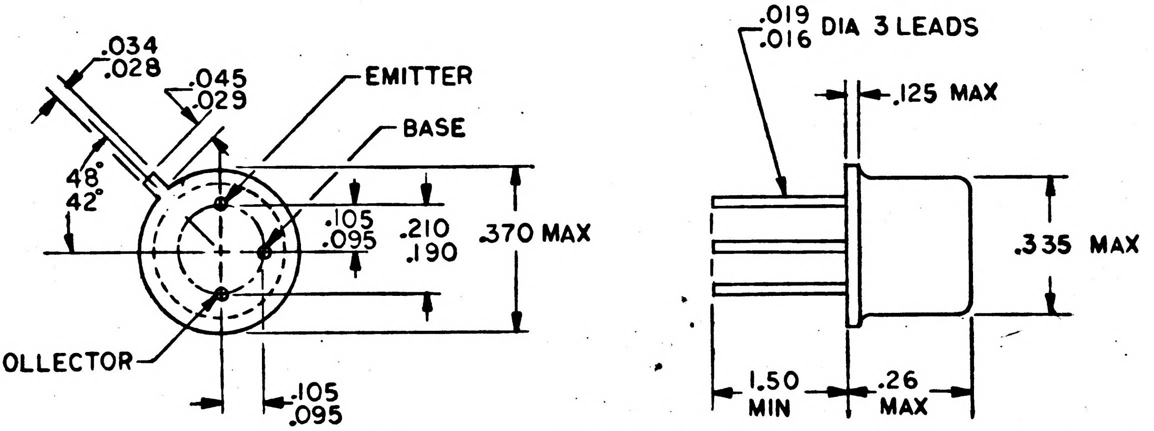
       - (a) AT PLUS 25 DEGREES CENTIGRADE CASE TEMPERATURE: 3.0 WATTS. THERMAL RESISTANCE (θ_{JC}): 58 DEGREES CENTIGRADE PER WATT.
       - (b) AT PLUS 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE: 800 MILLIWATTS. THERMAL RESISTANCE (θ_{JA}): 220 DEGREES CENTIGRADE PER WATT.
     - (4) COLLECTOR-EMITTER VOLTAGE (V_{CEO}):-50 VOLTS DC.
     - (5) BASE-EMITTER VOLTAGE (V_{BEO}): -5 VOLTS DC.
     - (6) COLLECTOR-BASE VOLTAGE (V_{CBO}):-50 VOLTS DC.
     - (7) COLLECTOR CURRENT (I_C): 800 MILLIAMPERES.
   - B. CONSTRUCTION: THE SEMICONDUCTOR MATERIAL SHALL BE PNP SILICON AND THE DEVICE SHALL BE HERMETICALLY SEALED IN A METAL CASE.



Ⓑ REPLACES REV A WITH CHANGE

MASTER

C	C
B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE, MASS.
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DRAWN H. Howard wm DATE 31 Jul 63
CHECKED J. Ruggeri 2 Aug 63
APPROVAL
APPROVAL Eldon C Hall 14 Aug 63
NASA APPROVAL W J Rhine 8-14-63
MIT APPROVAL W Kupfer 14 Aug 63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006829
SCALE NONE WT SHEET 1 OF 2

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGE AND URGRADED TO CLASS A PER TDRR 02618 A. Maynard CHK J Ruggeri APPD	8/14/63	WK
C	REVISED PER TDRR 04906	12/10/63	

TABLE I

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS MINIMUM	MAXIMUM	UNIT
COLLECTOR-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{CEX}	-	-100	NADC
BASE-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{BEX}	-	-100	NADC
COLLECTOR-BASE BREAKDOWN VOLTAGE	I_C=-10UA, I_E= 0	BV_{CBO}	-50	-	VDC
COLLECTOR-EMITTER BREAKDOWN VOLTAGE	I_C=-100MA, I_B=0	BV_{CEO}	-50	-	VDC
EMITTER-BASE BREAKDOWN VOLTAGE	I_E=-100UA, I_C=0	BV_{EBO}	-5	-	VDC
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=-10V, I_C=-0.1MA	hFE_1	30	-	-
	V_{CE}=-10V, I_C=-150MA NOTE 1	hFE_2	75	225	-
	V_{CE}=-1V, I_C=-150MA NOTE 1	hFE_3	30	-	-
	V_{CE}=-10V, I_C=-500MA NOTE 1	hFE_4	40	-	-
COLLECTOR-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	$V_{CE(SAT)_1}$	-	-0.4	VDC
	I_C=-500MA, I_B=-50MA	$V_{CE(SAT)_2}$	-	-1.2	VDC
BASE-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	$V_{BE(SAT)_1}$	-	-1.3	VDC
	I_C=-500MA, I_B=-50MA	$V_{BE(SAT)_2}$	-	-1.8	VDC
OUTPUT CAPACITANCE	V_{CB}=-10V, I_E=0, f=100KC	Cob	-	25	pf
CURRENT GAIN BANDWIDTH PRODUCT	I_C=-50MA, V_{CE}=-10V, f=100MC	f_T	120	-	MC
DELAY TIME	CIRCUIT PER FIGURE 1	t_d	-	15	nSEC
RISE TIME	CIRCUIT PER FIGURE 1	t_r	-	45	nSEC
STORAGE TIME	CIRCUIT PER FIGURE 2	t_s	-	225	nSEC
FALL TIME	CIRCUIT PER FIGURE 2	t_f	-	45	nSEC
CUTOFF CURRENT, COLLECTOR	V_{CB}=40V, I_E=0	I_{CBO}	-	-20	NADC
CUTOFF CURRENT, COLLECTOR	V_{CE}=40V, I_B=0	I_{CEO}	-	200	NADC

NOTE 1 PULSE CONDITIONS: WIDTH ≤ 300 USEC; DUTY CYCLE ≤ 2%.

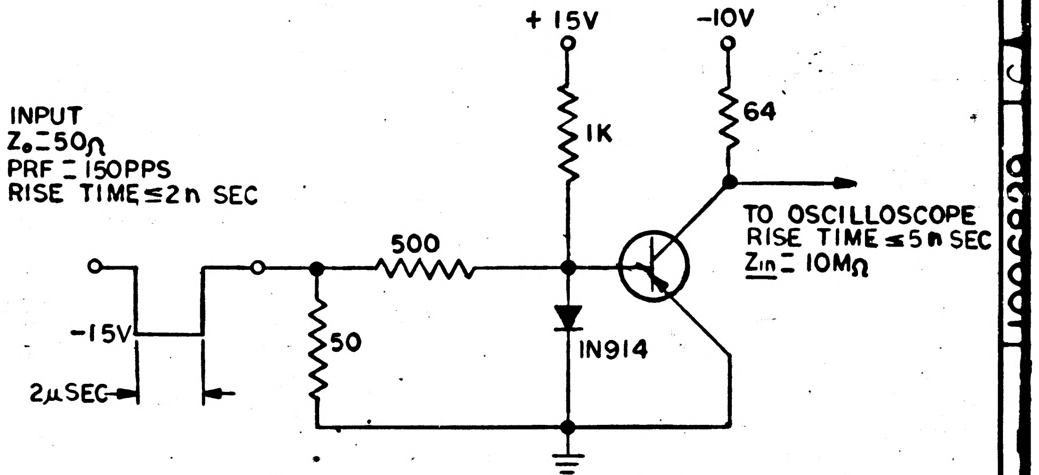

FIG. 1

Ⓑ REPLACES REV A WITH CHANGE

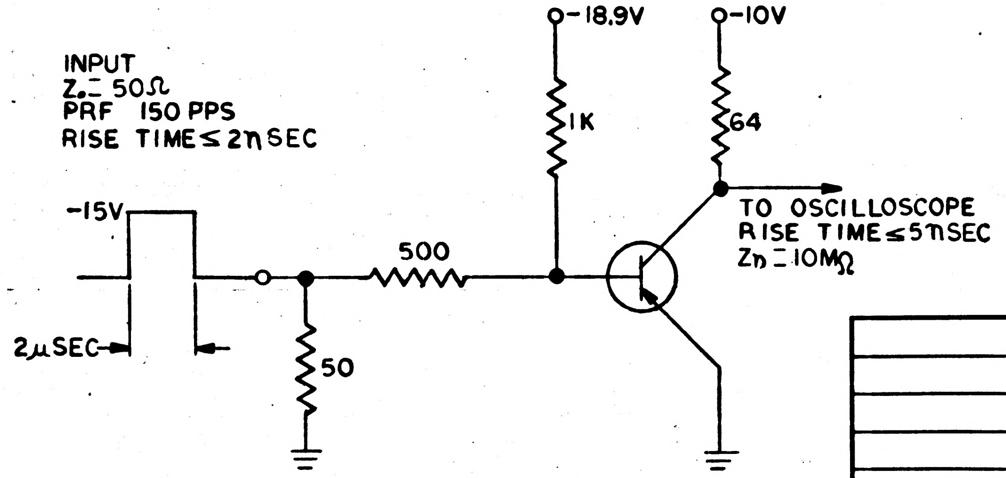

FIG. 2

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006829
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006829 D

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGE AND UPGRADED TO CLASS A PER TDRR 02618. CHK APPD	8/14/63	WW
C	REVISED PER TDRR 04906	12/16/63	
D	REVISED PER TDRR 05115	12/17/63	

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NOTES:

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C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 2.

D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002051.

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2. ACCEPTANCE AND INSPECTION:

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B. DIMENSIONS: AS SPECIFIED HEREIN. SAMPLE PER MIL-STD-10 , INSPECTION LEVEL I, AQL OF 4.0 PERCENT.

C. ELECTRICAL CHARACTERISTICS: PER TABLE I. 100 PERCENT INSPECTION.

(1) BREAKDOWN VOLTAGE, BV_{CEO}, BV_{CBO}, BV_{EBO}

(2) COLLECTOR CUTOFF CUTTENT, I_{CEX}, I_{CBO}, I_{CEO}

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D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, TERMINAL IDENTIFICATION, LOT CODE IDENTIFICATION AND NASA DRAWING NUMBER AND REVISION LETTER. SAMPLE PER MIL-STD-10, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.

3. DESIGN:

A. ABSOLUTE MAXIMUM RATINGS:

(1) STORAGE TEMPERATURE (T_{stg}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.

(2) JUNCTION OPERATING TEMPERATURE (T_j): PLUS 200 DEGREES CENTIGRADE.

(3) POWER DISSIPATION (TOTAL):

(a) AT PLUS 25 DEGREES CENTIGRADE CASE TEMPERATURE: 3.0 WATTS.
THERMAL RESISTANCE (θ_{JC}): 58 DEGREES CENTIGRADE PER WATT.

(b) AT PLUS 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE: 800 MILLIWATTS.
THERMAL RESISTANCE (θ_{JA}): 220 DEGREES CENTIGRADE PER WATT.

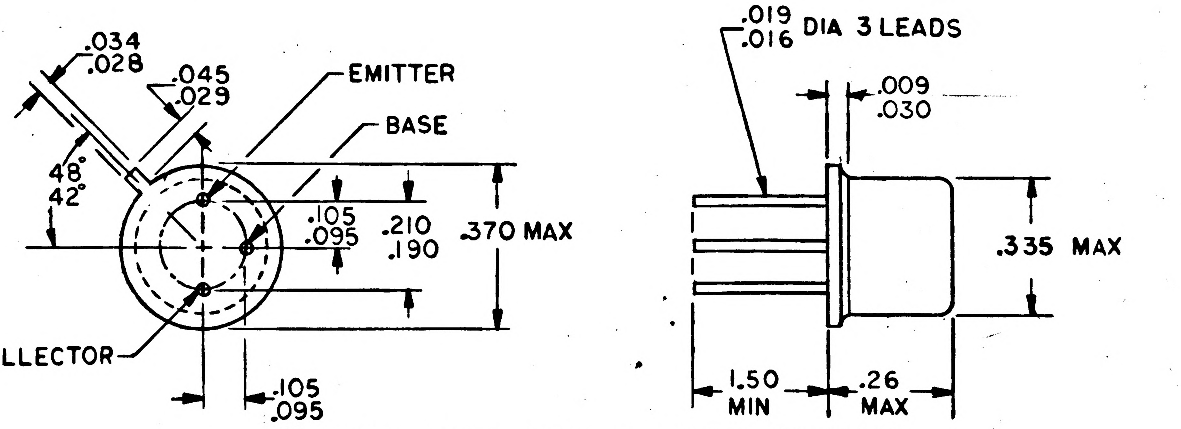
(4) COLLECTOR-EMITTER VOLTAGE (V_{CEO}):-50 VOLTS DC.

(5) BASE-EMITTER VOLTAGE (V_{BEO}): -5 VOLTS DC.

(6) COLLECTOR-BASE VOLTAGE (V_{CBO}):-50 VOLTS DC.

(7) COLLECTOR CURRENT (I_C): 800 MILLIAMPERES.

B. CONSTRUCTION: THE SEMICONDUCTOR MATERIAL SHALL BE PNP SILICON AND THE DEVICE SHALL BE HERMETICALLY SEALED IN A METAL CASE.



Ⓑ REPLACES REV A WITH CHANGE

D	C
C	C
B	B
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGE AND URGRADED TO CLASS A PER TDRR 02618 A. Maynard CHK J Ruggeri APPD	8/14/63	WK
C	REVISED PER TDRR 04906	12/10/63	PPK
D	REVISED PER TDRR 06012	2/4/64	PPK WK

TABLE I

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)					
PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS		
			MINIMUM	MAXIMUM	UNIT
COLLECTOR-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{CEX}	-	-100	NADC
BASE-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{BEX}	-	-100	NADC
COLLECTOR-BASE BREAKDOWN VOLTAGE	I_C=-10UA, I_E= 0	BV_{CBO}	-50	-	VDC
COLLECTOR-EMITTER BREAKDOWN VOLTAGE	I_C=-100MA, I_B=0 NOTE 1	BV_{CEO}	-50	-	VDC
EMITTER-BASE BREAKDOWN VOLTAGE	I_E=-100UA, I_C=0	BV_{EBO}	-5	-	VDC
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=-10V, I_C=-0.1MA	hFE_1	30	-	-
	V_{CE}=-10V, I_C=-150MA NOTE 1	hFE_2	75	225	-
	V_{CE}=-1V, I_C=-150MA NOTE 1	hFE_3	30	-	-
	V_{CE}=-10V, I_C=-500MA NOTE 1	hFE_4	40	-	-
COLLECTOR-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	$V_{CE(SAT)_1}$	-	-0.4	VDC
	I_C=-500MA, I_B=-50MA	$V_{CE(SAT)_2}$	-	-1.2	VDC
BASE-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	$V_{BE(SAT)_1}$	-	-1.3	VDC
	I_C=-500MA, I_B=-50MA	$V_{BE(SAT)_2}$	-	-1.8	VDC
OUTPUT CAPACITANCE	V_{CB}=-10V, I_E=0, f=100KC	Cob	-	25	pf
CURRENT GAIN BANDWIDTH PRODUCT	I_C=-50MA, V_{CE}=-10V, f=100MC	f_T	120	-	MC
DELAY TIME	CIRCUIT PER FIGURE 1	t_d	-	15	nSEC
RISE TIME	CIRCUIT PER FIGURE 1	t_r	-	45	nSEC
STORAGE TIME	CIRCUIT PER FIGURE 2	t_s	-	225	nSEC
FALL TIME	CIRCUIT PER FIGURE 2	t_f	-	45	nSEC
CUTOFF CURRENT, COLLECTOR	V_{CB}=40V, I_E=0	I_{CBO}	-	-20	NADC
CUTOFF CURRENT, COLLECTOR	V_{CE}=40V, I_B=0	I_{CEO}	-	200	NADC

NOTE 1 PULSE CONDITIONS: WIDTH ≤ 300 USEC; DUTY CYCLE ≤ 2%.

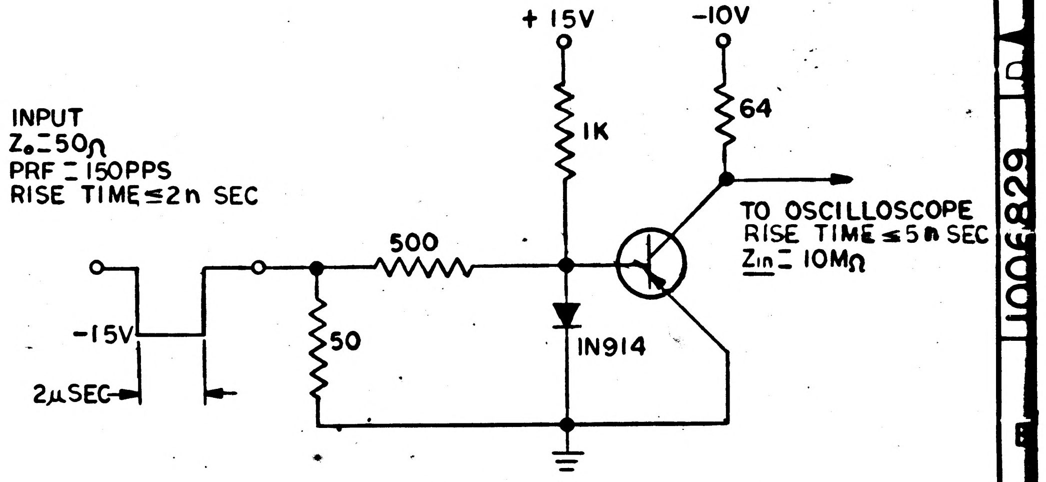

FIG. 1

Ⓑ REPLACES REV A WITH CHANGE

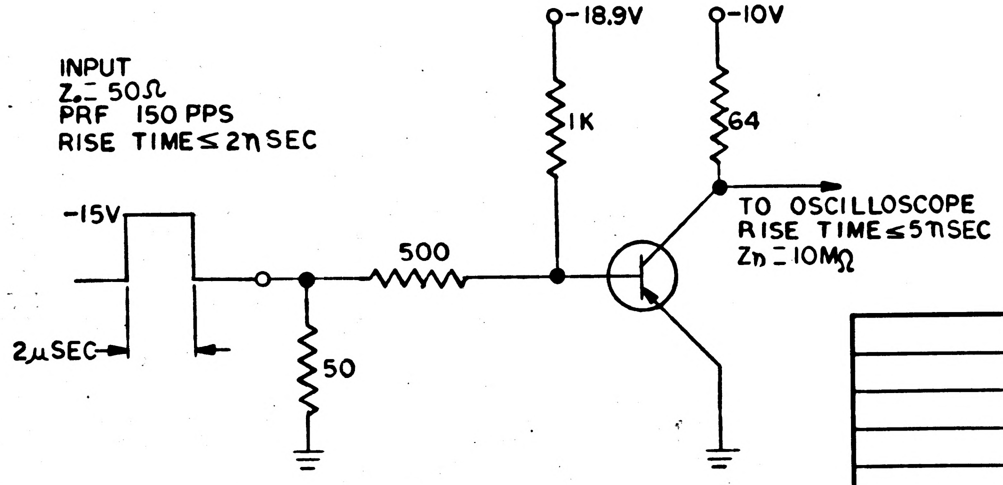

FIG. 2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

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1006829 E

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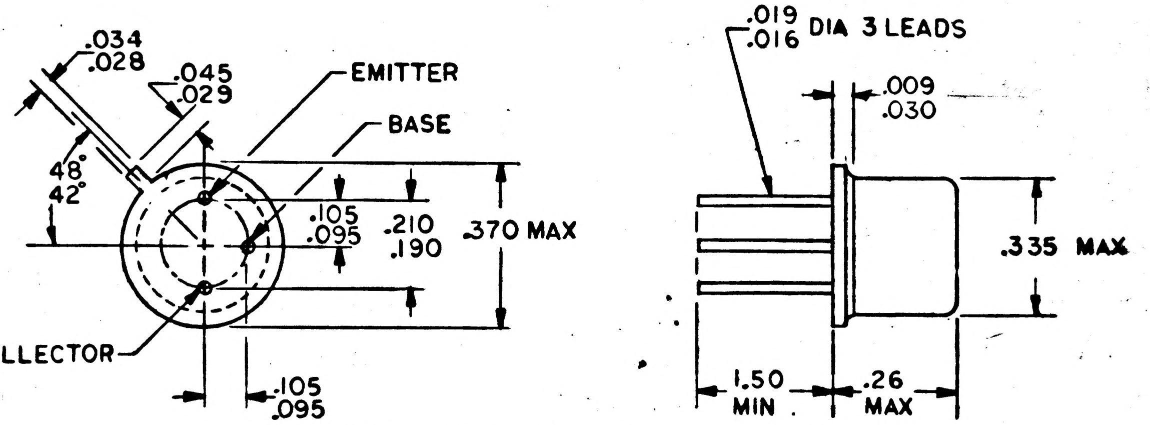
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGE AND UPGRADED TO CLASS A PER TDRR 02618. Howard CHK J. Ruggeri APPD	8/14/63	WH
C	REVISED PER TDRR 04906	12/16/63	
D	REVISED PER TDRR 05115	12/17/63	
E	REVISED PER TDRR 06012	2/4/64	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS AND EXCEPTIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A IN BOTH INSTANCES. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19491 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:
   - A. LEAD MATERIAL: IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. DIMENSIONS: AS SPECIFIED HEREIN. SAMPLE PER MIL-STD-10, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I. 100 PERCENT INSPECTION.
     - (1) BREAKDOWN VOLTAGE, BV_{CEO}, BV_{CBO}, BV_{EBO}
     - (2) COLLECTOR CUTOFF CUTTENT, I_{CEX}, I_{CBO}, I_{CEO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_2, hFE_3, hFE_4
     - (4) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)_1}$, $V_{BE(sat)_1}$
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, TERMINAL IDENTIFICATION, LOT CODE IDENTIFICATION AND NASA DRAWING NUMBER AND REVISION LETTER. SAMPLE PER MIL-STD-10, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.

3. DESIGN:
   - A. ABSOLUTE MAXIMUM RATINGS:
     - (1) STORAGE TEMPERATURE (T_{stg}): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.
     - (2) JUNCTION OPERATING TEMPERATURE (T_j): PLUS 200 DEGREES CENTIGRADE.
     - (3) POWER DISSIPATION (TOTAL):
       - (a) AT PLUS 25 DEGREES CENTIGRADE CASE TEMPERATURE: 3.0 WATTS. THERMAL RESISTANCE (θ_{JC}): 58 DEGREES CENTIGRADE PER WATT.
       - (b) AT PLUS 25 DEGREES CENTIGRADE AMBIENT TEMPERATURE: 800 MILLIWATTS. THERMAL RESISTANCE (θ_{JA}): 220 DEGREES CENTIGRADE PER WATT.
     - (4) COLLECTOR-EMITTER VOLTAGE (V_{CEO}): -50 VOLTS DC.
     - (5) BASE-EMITTER VOLTAGE (V_{BEO}): -5 VOLTS DC.
     - (6) COLLECTOR-BASE VOLTAGE (V_{CBO}): -50 VOLTS DC.
     - (7) COLLECTOR CURRENT (I_C): 800 MILLIAMPERES.
   - B. CONSTRUCTION: THE SEMICONDUCTOR MATERIAL SHALL BE PNP SILICON AND THE DEVICE SHALL BE HERMETICALLY SEALED IN A METAL CASE.



Ⓑ REPLACES REV A WITH CHANGE

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E	D
D	C
C	C
B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

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APPROVAL
APPROVAL Eldon C. Hall 14 Aug 63
NASA APPROVAL W. J. [illegible] 8-14-63
MIT APPROVAL W. [illegible] 14 Aug 63

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—	C	1006829
SCALE NONE	WT	SHEET 1 OF 2

INCHES
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REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. PART SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS, EXCEPTIONS OR SUBSTITUTIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 1.
   - D. PART SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A, IN BOTH INSTANCES. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19471 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.
   - F. MARKING: MARK EACH PART PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, DATE CODE, LOT CODE AND SERIAL NUMBER.
2. ACCEPTANCE AND INSPECTION
   - A. LEAD DATA: PER NASA DOCUMENT 1015402. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS: PER TABLE II.
     - (1) BREAKDOWN VOLTAGE, BV_{CEO}
     - (2) BREAKDOWN VOLTAGE, BV_{CBO}
     - (3) COLLECTOR CUTOFF CURRENT, I_{CEX}
     - (4) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_1
     - (5) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)}$
     - (6) BASE SATURATION VOLTAGE, $V_{BE(sat)}$
   - C. MARKING: SEE PARAGRAPH 1F.
3. DESIGN:

STORAGE TEMPERATURE (T_{stg}): -65° TO +200°C.
JUNCTION OPERATING TEMPERATURE (T_J): +200°C MAXIMUM.
ELECTRICAL RATINGS: PER TABLE I.
ELECTRICAL CHARACTERISTICS: PER TABLE II.
POWER DISSIPATION, TOTAL:
AT +25°C CASE TEMPERATURE: 3.0 WATTS
THERMAL RESISTANCE (θ_{JC}): 58°C/WATT
AT +25°C AMBIENT TEMPERATURE: 800 MILLIWATTS
THERMAL RESISTANCE (θ_{JA}): 220°C/WATT

4. SPECIAL CONDITIONING (BY SUPPLIER):
   - A. BURN-IN: PARTS SHALL BE BURNED-IN AT THE FOLLOWING CONDITIONS:
     - (1) AMBIENT TEMPERATURE, T_A = +25° ± 5°C.
     - (2) COLLECTOR VOLTAGE, V_{CB} = -25 VOLTS DC, MINIMUM.
     - (3) POWER DISSIPATION: 365 MILLIWATTS ± 10 PERCENT (T_J = +105°C).
     - (4) TIME, t = 240 HOURS, MINIMUM.
   - B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:
     - (1) BREAKDOWN VOLTAGE, BV_{CEO}
     - (2) COLLECTOR CUTOFF CURRENT, I_{CEX}
     - (3) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)}$
     - (4) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_2
   - C. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL TRANSISTOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR HAVE CHANGED MORE THAN 10% IN hFE, SHALL NOT BE ACCEPTABLE.

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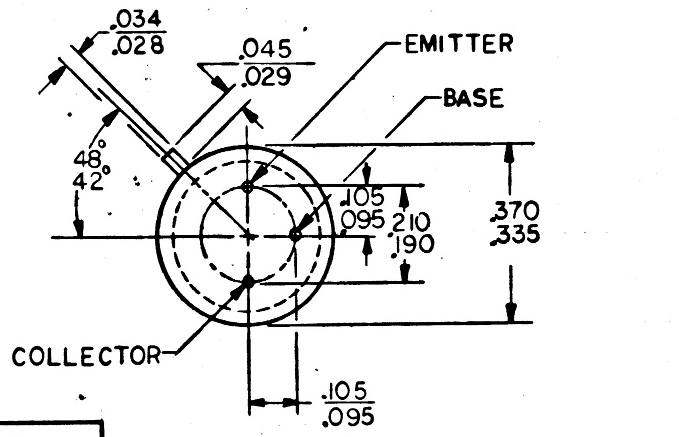

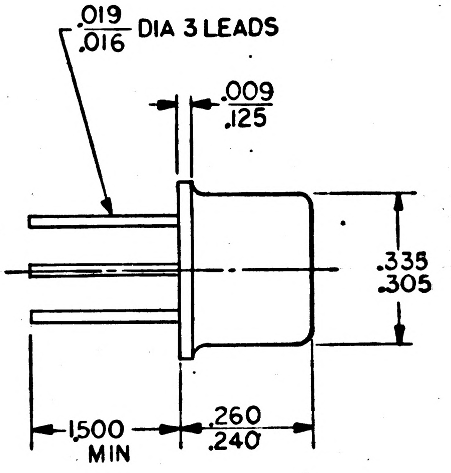

-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

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NASA APPROVAL 5/15/63
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SYM	DESCRIPTION	DATE	APPROVAL
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TABLE I

MANUFACTURER'S ABSOLUTE MAXIMUM RATINGS TC = +25°C					
COLLECTOR CURRENT (I_C)	COLLECTOR VOLTAGE (V_{CB})	EMITTER VOLTAGE (V_{EB})	COLLECTOR VOLTAGE (V_{CE})	COLLECTOR POWER DISSIPATION	MANUFACTURER'S TYPE DESIGNATION
MA	V_{DC}	V_{DC}	V_{DC}	W	
-800	-50	-5	-50	3.0	TO BE ASSIGNED

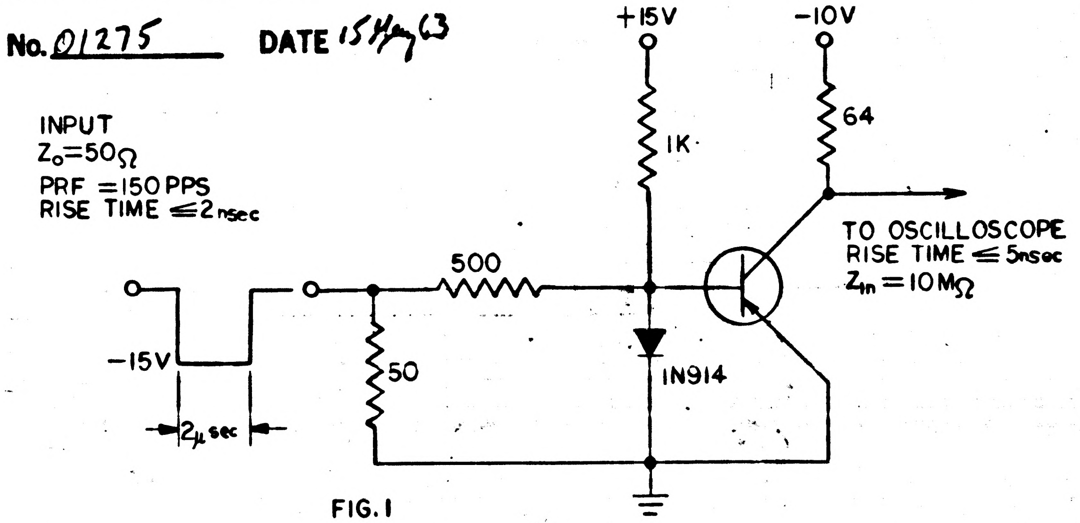

FIG. 1

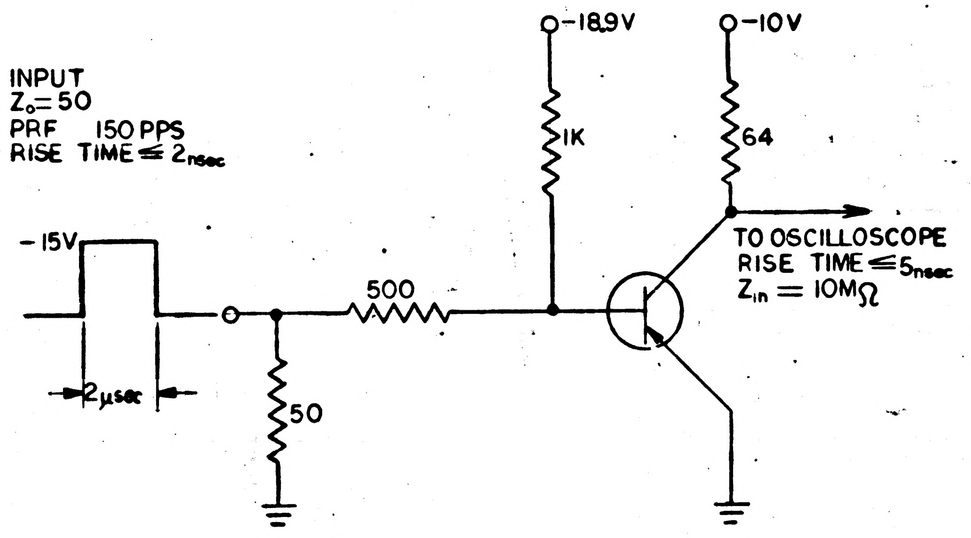

FIG. 2

TABLE II

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)					
PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS MINIMUM	MAXIMUM	UNIT
COLLECTOR-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{CEX}	-	-100	NADC
BASE-EMITTER CUTOFF CURRENT	V_{CE}=-25V, V_{BE}=-0.5V	I_{BEX}	-	-100	NADC
COLLECTOR-BASE BREAKDOWN VOLTAGE	I_C=-10UA, I_E= 0	BV_{CBO}	-50	-	VDC
COLLECTOR-EMITTER BREAKDOWN VOLTAGE	I_C=-100MA, I_B=0	BV_{CEO}	-50	-	VDC
EMITTER-BASE BREAKDOWN VOLTAGE	I_E=-100UA, I_C=0	BV_{EBO}	-5	-	VDC
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=-10V, I_C=-0.1MA	hFE_1	30	-	-
	V_{CE}=-10V, I_C=-150MA, ▷	hFE_2	75	225	-
	V_{CE}=-1V, I_C=-150MA ▷	hFE_3	30	-	-
	V_{CE}=-10V, I_C=-500MA ▷	hFE_4	40	-	-
COLLECTOR-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	V_{CE} (sat)	-	-0.4	VDC
	I_C=-500MA, I_B=-50MA		-	-1.2	VDC
BASE-EMITTER SATURATION VOLTAGE	I_C=-150MA, I_B=-15MA	V_{BE} (sat)	-	-1.3	VDC
	I_C=-500MA, I_B=-50MA		-	-1.8	VDC
OUTPUT CAPACITANCE	V_{CB}=-10V, I_E=0, f=100KC	Cob	-	25	pf
CURRENT GAIN BANDWIDTH PRODUCT	I_C=-50MA, V_{CE}=-10V, f=100MC	f_T	120	-	MC
DELAY TIME	CIRCUIT PER FIGURE 1	t_d	-	15	nSEC
RISE TIME	CIRCUIT PER FIGURE 1	t_r	-	45	nSEC
STORAGE TIME	CIRCUIT PER FIGURE 2	t_s	-	225	nSEC
FALL TIME	CIRCUIT PER FIGURE 2	t_f	-	45	nSEC

▷ PULSE CONDITIONS: WIDTH ≤ 300 USEC; DUTY CYCLE ≤ 2%.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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MATERIAL
HEAT TREATMENT
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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Cummins DATE 1 MAY 63
CHECKED J. Ruggiero A. Gelroy 6 MAY 63
APPROVAL
APPROVAL Eldon C. Hall 5-15-63
NASA APPROVAL [illegible] 5/15/63
MIT APPROVAL W Kupfer 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, PNP, SILICON (SWITCHING)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. - 1006829
SCALE
WT
SHEET 2 OF 2

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1006829

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

A 1006830

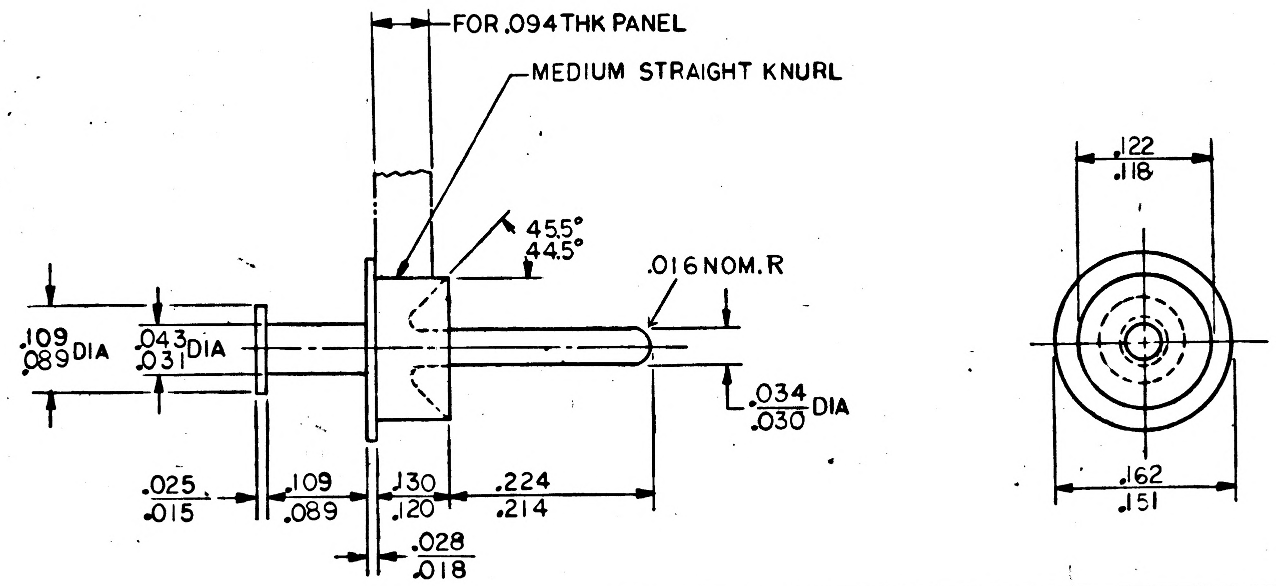
REVISIONS TDRR 01163

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 02592	8/14/63	WK

Ⓜ

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.
2. DESIGN REQUIREMENTS:
   - A. MATERIAL: BRASS PER QQ-B-626, COMPOSITION 22, 1/2 HARD.
   - B. FINISH: GOLD PLATED PER MIL-G-45204, TYPE II, CLASS 1.



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

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DRAWN H. Prunier DATE 30 APR 63
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APPROVAL W.B. Turner 5/7/63
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL W. Cupples 9 May 63

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TERMINAL, STUD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006830
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006830

REVISIONS TDRR 01163			
SYM	DESCRIPTION	DATE	APPROVAL

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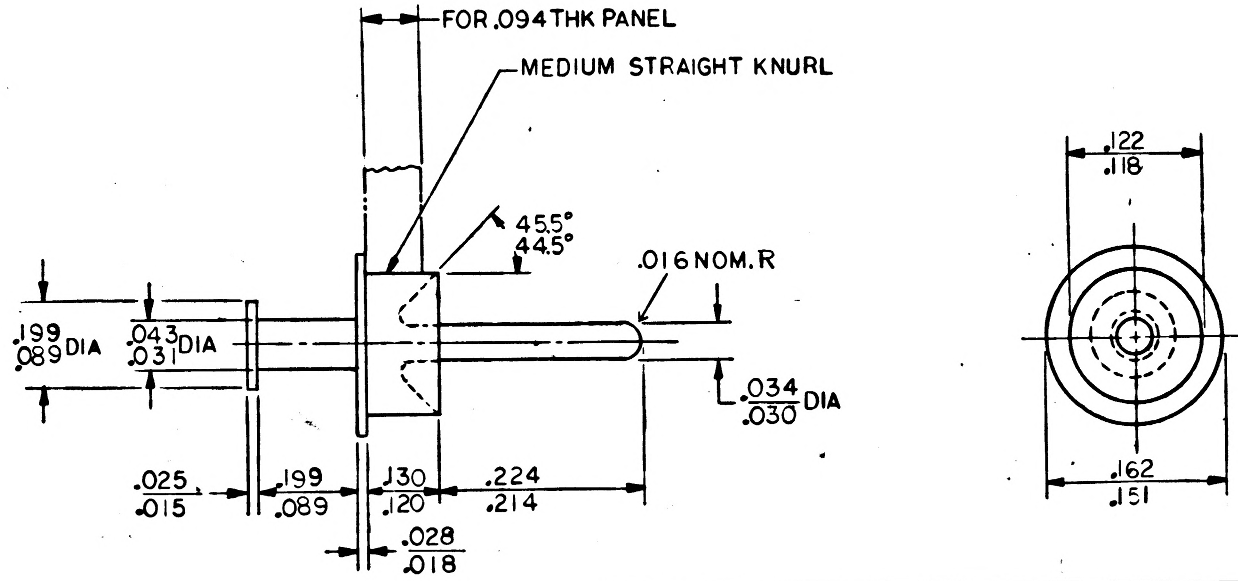
REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.
2. DESIGN REQUIREMENTS:
   A. MATERIAL: BRASS PER QQ-B-626, COMPOSITION 22, 1/2 HARD.
   B. FINISH: GOLD PLATED PER MIL-G-45204, TYPE II, CLASS 1.



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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MATERIAL SEE NOTES
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FINAL FINISH NONE

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CHECKED D. Lindell / A. Maynard 7 MAY 63
APPROVAL W.B. Turner 5/7/63
APPROVAL
NASA APPROVAL Jack Barnes
MIT APPROVAL W. Cuffer 9 May 63

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TERMINAL, STUD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006830
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INCHES
0 1 2
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1006832

REVISIONS TDRR 01901

SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, LOT OR SERIAL NUMBER, ITEM NAME, NASA DRAWING NUMBER, REVISION LETTER AND DATE OF MANUFACTURE OR CODING.
2. DESIGN:
   - A. MATERIAL: SHALL BE A TWO PART, ROOM TEMPERATURE CURING LOW EXOTHERM SEMI-FLEXIBLE EPOXY RESIN.
   - B. THIS MATERIAL, WHEN CURED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, SHALL EXHIBIT THE FOLLOWING PROPERTIES:
     - (1) VOLUME RESISTIVITY PER ASTM D-257 TEST METHOD: 10^{12} MINIMUM.
     - (2) DISSIPATION FACTOR (1000 CYCLES AT 23°C) PER ASTM D-150 TEST METHOD: 0.075 MAX.
     - (3) DIELECTRIC CONSTANT (1000 CYCLES AT 23°C) PER ASTM D-150 TEST METHOD: 4.3 MIN.
     - (4) ELECTRIC STRENGTH PER ASTM D-149 TEST METHOD: 400 VOLTS/MIL MINIMUM.
     - (5) HARDNESS (DUROMETER SHORE D): 70 MINIMUM.
     - (6) MOISTURE ABSORPTION (PERCENT OF WEIGHT GAIN) PER MIL-I-16923-C, TYPE C TEST METHOD: 0.5 MAXIMUM.
     - (7) SPECIFIC GRAVITY: 1.05 TO 1.17.
     - (8) INITIAL VISCOSITY AT 23°C: 5700 CPS
   - C. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F, SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.W. R. Wheeler DATE 11 June 63
CHECKED J. Ruggiero / A. Maynard 11 JUNE 63
APPROVAL A. C. Smith 6-28-63
APPROVAL
NASA APPROVAL W J Rhine 7-2-63
MIT APPROVAL D Hoag 7/2/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

EPOXY RESIN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006832
SCALE NONE
WT
SHEET 1 OF 1

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006832

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006834

REVISIONS TDRR 01451			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, REVISION LETTER AND DATE OF MANUFACTURE.
2. ACCEPTANCE AND INSPECTION:
   - A. PROPERTIES:
     - (1) COLOR - WHITE TO CREAM.
     - (2) VISCOSITY AT 77°F - 50,000 CENTISTOKES.
     - (3) SPECIFIC GRAVITY AT 77°F - 1.13
3. DESIGN:
   - A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES AFTER BEING CATALYZED WITH STANNOUS OCTOATE.
     - (1) HARDNESS - DUROMETER SHORE A, ASTM D676: 35 MINIMUM.
     - (2) TENSILE STRENGTH, PSI, ASTM D412: 300 MINIMUM.
     - (3) ELONGATION PERCENT ASTM D412: 100 MINIMUM.
     - (4) DIELECTRIC STRENGTH, VOLTS PER MIL (1/16 INCH THICK SPECIMEN) ASTM D149: 550 TYPICAL, 450 MINIMUM.
   - B. STORAGE AND SHELF LIFE: SHOULD BE STORED AT TEMPERATURES BELOW 70 DEGREES F. THE AS RECEIVED MATERIAL WHEN STORED UNDER THESE CONDITIONS SHALL HAVE A SHELF LIFE OF AT LEAST FOUR (4) MONTHS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.D. R. Wheeler DATE 6 May 63
CHECKED J. [illegible] H. Maynard 17 MAY 63
APPROVAL S. C. Smith 5-31-63
APPROVAL
NASA APPROVAL W. J. [illegible] 6-5-63
MIT APPROVAL D. Hoag 6/5/63

MANNED SPACECRAFT CENTER
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COMPOUND, SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
	C	1006834	
SCALE NONE	WT		SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006835

REVISIONS TDRR 01451

SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, REVISION LETTER AND DATE OF MANUFACTURE.
2. DESIGN:
   - A. MATERIAL: STANNOUS OCTOATE - TIN OCTOATE WITH STANNOUS TIN CONCENTRATE OF 28 PERCENT.
   - B. CAPABILITIES: THIS MATERIAL SHALL BE SUITABLE FOR USE AS A CURING AGENT FOR EPOXY RESIN.
   - C. SHELF LIFE: WHEN STORED AT 70°F THE AS PURCHASED MATERIAL SHALL HAVE A SHELF LIFE OF NOT LESS THAN 4 MONTHS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN DATE 18 May 63
CHECKED 21 MAY 63
APPROVAL 5-31-63
APPROVAL
NASA APPROVAL 6-5-63
MIT APPROVAL 6/18/63

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STANNOUS OCTOATE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006835
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006835

1006836

REVISIONS TDRR 01451

SYM	DESCRIPTION	DATE	APPROVAL

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   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, REVISION LETTER AND DATE OF MANUFACTURE.
2. DESIGN:
   - A. MATERIAL: SHALL BE A LOW VISCOSITY, GENERAL PURPOSE CASTING RESIN.
   - B. COLOR: NORMALLY BLACK. OTHER COLORS WHEN SPECIFIED ON PURCHASE ORDER.
   - C. THIS MATERIAL, WHEN CURED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS SHALL EXHIBIT THE FOLLOWING PROPERTIES:
     - (1) TENSILE STRENGTH, PSI: 7000 MIN
     - (2) COMPRESSIVE STRENGTH, PSI: 14,000 MIN
     - (3) FLEXURAL STRENGTH, PSI: 12,000 MIN
     - (4) IZOD IMPACT, FOOT-LB/IN OF NOTCH: 0.2 MIN
     - (5) THERMAL EXPANSION COEFFICIENT PER °C: 25 X 10^{-6} MAX
     - (6) WATER ABSORPTION (7 DAYS AT 25°C): 0.15 PERCENT MAX
     - (7) VOLUME RESISTIVITY (OHM-CM) -25°C: 4 X 10^{16} MIN
     - (8) DIELECTRIC CONSTANT, TO 10^{10} CPS: 4.2 MIN
     - (9) DISSIPATION FACTOR, - TO 10^{8} CPS: 0.01 MAX
       - TO 10^{10} CPS: 0.02 MAX
     - (10) DIELECTRIC STRENGTH (VOLTS/MIL): 440 MIN
   - D. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F, SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.
3. QUANTITIES: AS SPECIFIED ON PURCHASE ORDER.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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FRACTIONS ± DECIMALS ± ANGLES ±
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FINAL FINISH

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DWG. NO. CONTRACT

DRAWN Ray Wheeler DATE 18 May 63
CHECKED J. Logan / H. Maynard 22 MAY 63
APPROVAL S. C. Smith 5-31-63
APPROVAL

NASA APPROVAL W J Rhine 6-5-63

MIT APPROVAL D. Hazel 6/5/63

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EPOXY RESIN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO 1006836

SCALE NONE
WT
SHEET 1 OF 1

INCHES
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PHOTOGRAPHIC SCALE ONLY

1006836

4 3 2 1

1006837

REVISIONS 02360			
SYM	DESCRIPTION	DATE	APPROVAL

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NOTES:

1. GENERAL REQUIREMENTS:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
    - C. CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, NET CONTENTS, DATE OF MANUFACTURE, PLUS NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLE):
    - A. MECHANICAL PROPERTIES AT 25° CENTIGRADE.
        - (1) SPECIFIC GRAVITY: 1.002 - 1.007.
        - (2) VISCOSITY: 60 - 70 CENTIPOISE WHEN MEASURED ON A BROOKFIELD VISCOSIMETER USING A NO. 1 SPINDLE AT 10 RPM.
        - (3) COLOR: CLEAR AMBER.
3. DESIGN REQUIREMENTS:
    - A. STORAGE LIFE: 1 YEAR MINIMUM WHEN STORED IN CLOSED CONTAINERS AT ROOM TEMPERATURE.
    - B. THIS MATERIAL SHALL BE FURNISHED IN THE QUANTITIES SPECIFIED IN THE PURCHASE ORDER.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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	LIST OF MATERIALS		

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MIT INSTRUMENTATION LAB
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DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 18 May 63
CHECKED J. Rogers / H. Weisgerber 11 June 63
APPROVAL L. E. Smith 7-31-63
APPROVAL
NASA APPROVAL W. J. Rhine 7-31-63
MIT APPROVAL L. Wolfe 7/31/63

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HOUSTON, TEXAS

CURING AGENT, AMINE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006837
SCALE NONE	WT	SHEET 1 OF 1

4 3 2 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006837

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1006838 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REPLACED BY REV B WITH CHANGES PER TDRR 01637	4/19/63	T.E.K.

REQUIREMENTS:

GENERAL:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 CLASS 2.
UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.
UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491 LEVEL A IN BOTH INSTANCES.

INSPECTION & ACCEPTANCE:

LEAD DATA: LEADS SHALL BE IRON-NICKEL ALLOY (DUMET) PER ND 1015401 CERTIFICATION OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

MARKING: UNIT PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL AND TYPE DESIGNATION. THE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER SHALL ALSO BE INCLUDED. THE DIODES SHALL BE MARKED ONLY WITH COLOR CODED IDENTIFYING BANDS IN ACCORDANCE WITH MIL-S-19500 AND MIL-STD-174.

ELECTRICAL SPECIFICATIONS PER TABLE I.
ZENER VOLTAGE (V_Z)
ZENER IMPEDANCE (Z_{ZT})

DESIGN REQUIREMENTS:

MAXIMUM RATINGS:

ZENER CURRENT: 60 ma DC

POWER DISSIPATION: 400 MILLIWATTS (SEE DERATING CURVE)

STORAGE TEMPERATURE: -65°C TO +150°C

TEMPERATURE COEFFICIENT: .002%/°C WITH A ZENER CURRENT OF 7.5 ma.

SPECIAL CONDITIONING BY SUPPLIER:

UNITS SHALL BE BURNED IN FOR 240 HOURS AT THE FOLLOWING CONDITIONS:

1. AMBIENT TEMPERATURE 100°C ±5°C.
2. POWER DISSIPATION: 50% OF THE 100°C CASE TEMPERATURE RATING.

UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN IN SHALL NOT BE SHIPPED.

THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN IN.

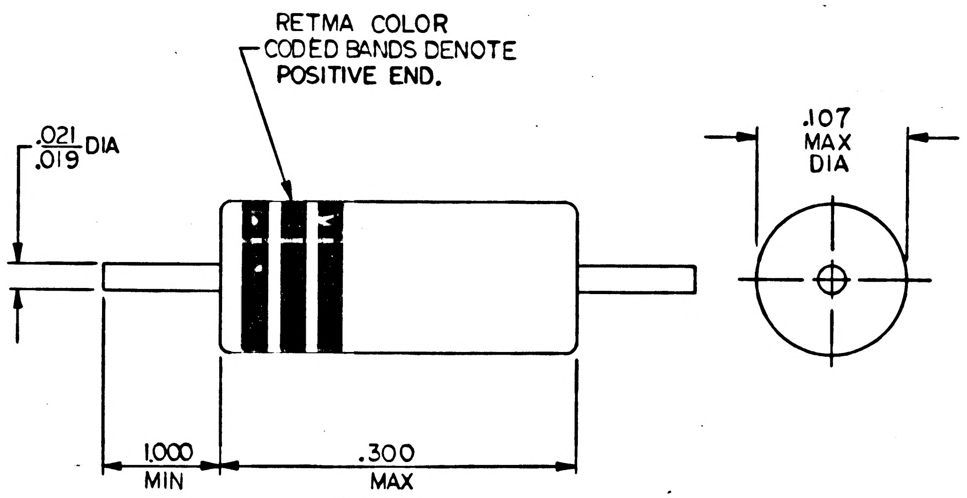
1. ZENER VOLTAGE (V_Z)
2. DYNAMIC IMPEDANCE (Z_ZT)
3. LEAKAGE CURRENT (I_R)

PARAMETRIC CHANGE LIMITS:

1. ZENER VOLTAGE: ±.05% OF INITIAL MEASURED VALUE
2. DYNAMIC IMPEDANCE: ±5% OF INITIAL MEASURED VALUE
3. LEAKAGE CURRENT: SHALL NOT EXCEED 100% OF INITIAL MEASURED VALUE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01450 DATE 6/5/63



Ⓐ REPLACED BY REV B WITH CHANGES

A	A
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
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DWG. NO. CONTRACT
DRAWN R. Kane DATE 10 Aug. 63
CHECKED [illegible] 3 June 63
APPROVAL
APPROVAL Eldon C Hall 3 June 63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL L. Wafel 6/5/63

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SEMICONDUCTOR DEVICE, DIODE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006838
SCALE NONE WT SHEET 1 OF 2

INCHES 0 1 2
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1006838 A Ⓜ

REVISIONS

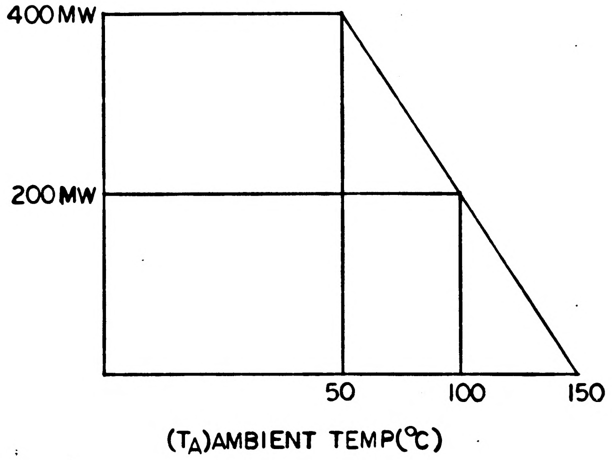
SYM	DESCRIPTION	DATE	APPROVAL
A	REPLACED BY REV B WITH CHANGES PER TDRR 01637	4/19/63	T.E.T.

TABLE I

ELECTRICAL CHARACTERISTICS AT AMBIENT TEMPERATURE = 25°C (UNLESS OTHERWISE SPECIFIED)					
PARAMETER	CONDITIONS	SYMBOL	SPECIFICATION LIMITS		
			MIN	MAX	UNITS
ZENER VOLTAGE	I_{ZT} = 7.5 MA	V_Z	5.9	6.5	VOLTS
ZENER IMPEDANCE	I_{ZT} = 7.5 MA	Z_{ZT}	-	10	OHMS
ZENER IMPEDANCE	I_{ZK} = 1 MA	Z_{ZK}		200	OHMS
LEAKAGE CURRENT	V_Z = 5.0 VOLTS	I_R		100	ua

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01450 DATE 6/5/6



DERATING CURVE

Ⓐ REPLACED BY REV B WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTES

HEAT TREATMENT NONE

FINAL FINISH NONE

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DRAWN R. Kane DATE 10 May 63
CHECKED 3 June 63
APPROVAL
APPROVAL Eldon C Hall 3 June 63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL L. Nafel 6/5/6

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SEMICONDUCTOR DEVICE, DIODE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006838

SCALE NONE WT SHEET 2 OF 2

MASTER

INCHES
0 1 2
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1006838 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN AND UPGRADED TO CLASS "A" WITH CHANGES PER TDRR 1637	6/19/63	E.E.L.

REQUIREMENTS:

1. GENERAL:

   A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.

   B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.

   C. UNITS SHALL MEET ALL QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002054 UNLESS MODIFIED OR AMMENDED BY SECTION 3 OF THIS DRAWING.

   D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A.

   E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. INSPECTION & ACCEPTANCE:

   A. MECHANICAL REQUIREMENTS:

      (1) LEAD DATA: LEADS SHALL BE IRON-NICKEL ALLOY (DUMET) PER ND 1015401. CERTIFICATION OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (2) MARKING: UNIT PACKAGES SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, AND LOT CODE IDENTIFICATION. THE DIODES SHALL BE MARKED ONLY WITH COLOR CODED IDENTIFYING BANDS IN ACCORDANCE WITH MIL-S-19500 AND MIL-STD-174.

   B. ELECTRICAL CHARACTERISTICS PER TABLE I:

      (1) ZENER VOLTAGE (V_Z)

      (2) ZENER IMPEDANCE (Z_{ZT}) (Z_{ZK})

      (3) LEAKAGE CURRENT (I_{R_1}) (I_{R_2})

3. DESIGN REQUIREMENTS:

   A. MAXIMUM RATINGS:

      (1) POWER DISSIPATION: 400 MILLIWATTS (SEE DERATING CURVE).

      (2) STORAGE TEMPERATURE: -65°C TO +150°C.

      (3) OPERATING TEMPERATURE: -65°C TO +125°C (AT 7.5 MA).

      (4) TEMPERATURE COEFFICIENT: .002%/°C WITH A ZENER CURRENT OF 7.5 ma OVER THE TEMPERATURE RANGE OF -55°C TO +100°C.

      (5) ENCLOSURE: GLASS, HERMETICALLY SEALED.

4. SPECIAL CONDITIONING BY SUPPLIER:

   A. UNITS SHALL BE BURNED IN FOR 240 HOURS AT THE FOLLOWING CONDITIONS:

      (1) AMBIENT TEMPERATURE 100°C ± 5°C AT ZENER CURRENT OF 15 MA.

   B. THE MANUFACTURER SHALL RECORD THE ELECTRICAL CHARACTERISTICS PER TABLE I PRIOR TO AND FOLLOWING BURN IN. DATA SHALL BE SUPPLIED WITH THE PARTS.

   C. PARAMETRIC CHANGE LIMITS:

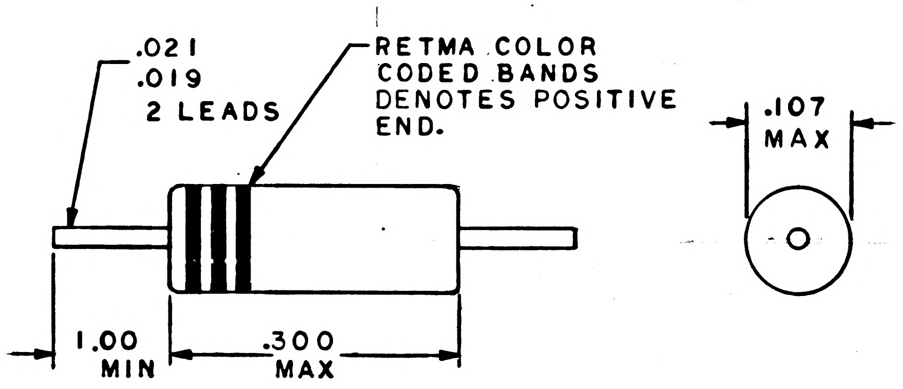
      (1) ZENER VOLTAGE: ± .1% OF INITIAL MEASURED VALUE.

      (2) DYNAMIC IMPEDANCE: ± 10% OF INITIAL MEASURED VALUE.

      (3) LEAKAGE CURRENT: SHALL NOT EXCEED 100% OF INITIAL MEASURED VALUE.

   D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN IN SHALL NOT BE SHIPPED.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.



Ⓑ REPLACES REV A WITH CHANGES

B	B
A	A
-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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DRAWN C. Crespi DATE 11 June 63
CHECKED 11 June 63
APPROVAL 6/19/63
APPROVAL Eldon C Hall 19 June 63
NASA APPROVAL 6/19/63
MIT APPROVAL 6/19/63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006838
SCALE NONE
WT
SHEET 1 OF 2

1006838

INCHES
0 1 2
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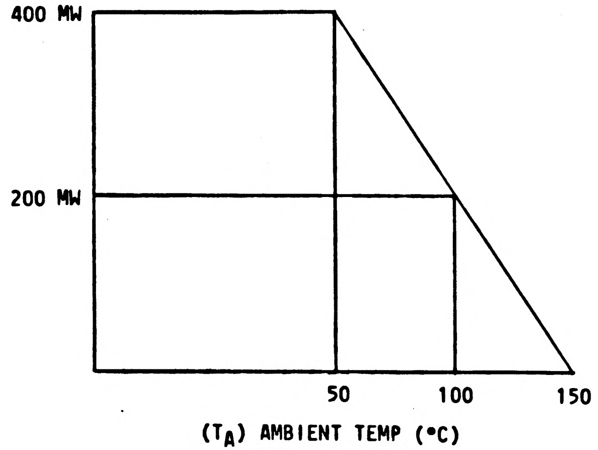
B 1006838

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN AND UPGRADED TO CLASS "A" WITH CHANGES PER TDRR 1637	4/19/63	

TABLE I

ELECTRICAL CHARACTERISTICS AT AMBIENT TEMPERATURE = 29°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITIONS	SYMBOL	SPECIFICATION LIMITS		
			MIN	MAX	UNITS
ZENER VOLTAGE	I_{ZT} = 7.5 MA	V_Z	5.9	6.5	VOLTS
ZENER IMPEDANCE	I_{ZT} = 7.5 MA	Z_{ZT}	-	10	OHMS
ZENER IMPEDANCE	I_{ZK} = 1 MA	Z_{ZK}	–	150	OHMS
LEAKAGE CURRENT	V_Z = 5.0 VOLTS	I_{R1}	–	100	ua
LEAKAGE CURRENT	V_Z = 3.0 VOLTS @ 100°C	I_{R2}	—	200	ua



DERATING CURVE

Ⓑ REPLACES REV A WITH CHANGES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
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DRAWN C. Crespi DATE 11 June 63
CHECKED 11 June 63
APPROVAL 6/18/63
APPROVAL Eldon C Hall 11 June 63
NASA APPROVAL 6/17/63
MIT APPROVAL 6/13/63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006838
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

C	1006838

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

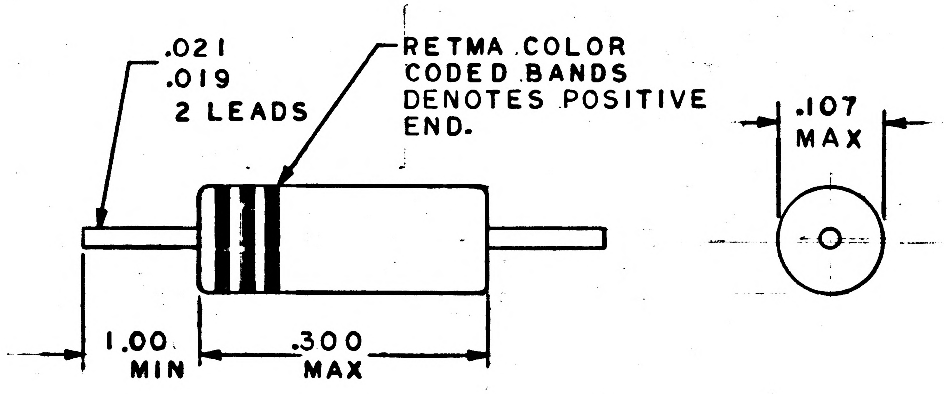
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN AND UPGRADED TO CLASS "A" WITH CHANGES PER TDRR 1637	4/8/63	K.E.K.
C	REVISED PER TDRR 04905	12/10/6	[illegible]

REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002054.
   - D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A.
   - E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. INSPECTION & ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD DATA: LEADS SHALL BE IRON-NICKEL ALLOY (DUMET) PER ND 1015401. CERTIFICATION OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (2) MARKING: UNIT PACKAGES SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, AND LOT CODE IDENTIFICATION. THE DIODES SHALL BE MARKED ONLY WITH COLOR CODED IDENTIFYING BANDS IN ACCORDANCE WITH MIL-S-19500 AND MIL-STD-174.
   - B. ELECTRICAL CHARACTERISTICS PER TABLE I:
     - (1) ZENER VOLTAGE (V_Z)
     - (2) ZENER IMPEDANCE (Z_{ZT}) (Z_{ZK})
     - (3) LEAKAGE CURRENT (I_{R_1}) (I_{R_2})
3. DESIGN REQUIREMENTS:
   - A. MAXIMUM RATINGS:
     - (1) POWER DISSIPATION: 400 MILLIWATTS (SEE DERATING CURVE).
     - (2) STORAGE TEMPERATURE: -65°C TO +150°C.
     - (3) OPERATING TEMPERATURE: -65°C TO +125°C (AT 7.5 MA).
     - (4) TEMPERATURE COEFFICIENT: ±.002%/°C WITH A ZENER CURRENT OF 7.5 ma OVER THE TEMPERATURE RANGE OF -55°C TO +100°C. TREF = 25°C
     - (5) ENCLOSURE: GLASS, HERMETICALLY SEALED.
4. SPECIAL CONDITIONING BY SUPPLIER:
   - A. UNITS SHALL BE BURNED IN FOR 240 HOURS AT THE FOLLOWING CONDITIONS:
     - (1) AMBIENT TEMPERATURE 100°C ± 5°C AT ZENER CURRENT OF 15 MA.
   - B. THE MANUFACTURER SHALL RECORD THE ELECTRICAL CHARACTERISTICS PER TABLE I PRIOR TO AND FOLLOWING BURN IN. DATA SHALL BE SUPPLIED WITH THE PARTS.
   - C. PARAMETRIC CHANGE LIMITS:
     - (1) ZENER VOLTAGE: ±1.0% OF INITIAL MEASURED VALUE.
     - (2) DYNAMIC IMPEDANCE: (Z_{ZK}) ± 10% OF INITIAL MEASURED VALUE. (Z_{ZT}) ± 10% OF INITIAL MEASURED VALUE OR 1 OHM WHICH EVER IS GREATER.
     - (3) LEAKAGE CURRENT: SHALL NOT EXCEED 100% OF INITIAL MEASURED VALUE OR 10 MICROAMPERES, WHICHEVER IS GREATER.
   - D. UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN IN SHALL NOT BE SHIPPED.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.



Ⓑ REPLACES REV A WITH CHANGES

C	C
B	B
A	A
-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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CHECKED J. Ruggeri / A. Maynard 11 June 63
APPROVAL [illegible] 6/19/63
APPROVAL Eldon C Hall 19 June 63
NASA APPROVAL [illegible] 6/19/63
MIT APPROVAL [illegible] 6/19/63

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SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006838
SCALE NONE	WT	SHEET 1 OF 2

INCHES
0 1 2
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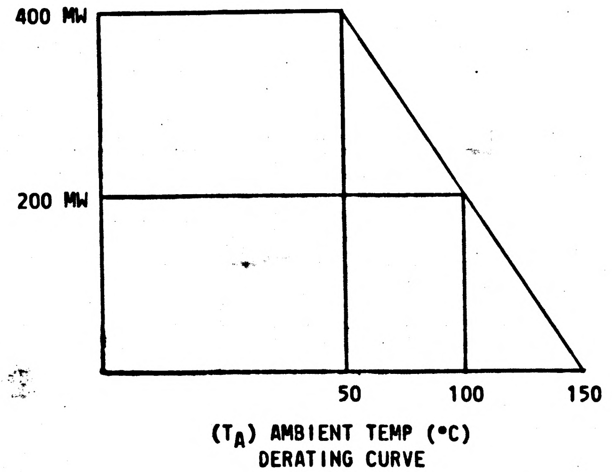
REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN AND UPGRADED TO CLASS "A" WITH CHANGES PER TDRR 1637	4/19/63	L.E.L.
C	REVISED PER TDRR 04905	12/10/63	

TABLE I

ELECTRICAL CHARACTERISTICS AT AMBIENT TEMPERATURE = 25°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITIONS	SYMBOL	SPECIFICATION LIMITS MIN	MAX	UNITS
ZENER VOLTAGE	I_{ZT} = 7.5 MA	V_Z	5.9	6.5	VOLTS
ZENER IMPEDANCE	I_{ZT} = 7.5 MA	Z_{ZT}	–	10	OHMS
ZENER IMPEDANCE	I_{ZK} = 1 MA	Z_{ZK}	–	150	OHMS
LEAKAGE CURRENT	V_Z = 5.0 VOLTS	I_{R1}	–	10	ua
LEAKAGE CURRENT	V_Z = 3.0 VOLTS @ 100°C	I_{R2}	–	100	ua



DERATING CURVE

MASTER

(B) REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
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DRAWN C. Crespi DATE 1 Aug 63
CHECKED J. Ruggiero / H. Magnar 11 JUNE 63
APPROVAL 6/18/63
APPROVAL Eldon C Hall 11 June 63
NASA APPROVAL 6/17/63
MIT APPROVAL L.E. Larson 6/19/63

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SEMICONDUCTOR DEVICE, DIODE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006838
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
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1006838

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			

REQUIREMENTS:

GENERAL:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 CLASS 2.
UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.
UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491 LEVEL A IN BOTH INSTANCES.

INSPECTION & ACCEPTANCE:

LEAD DATA: LEADS SHALL BE IRON-NICKEL ALLOY (DUMET) PER ND 1015401 CERTIFICATION OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

MARKING: UNIT PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL AND TYPE DESIGNATION. THE NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER SHALL ALSO BE INCLUDED. THE DIODES SHALL BE MARKED ONLY WITH COLOR CODED IDENTIFYING BANDS IN ACCORDANCE WITH MIL-S-19500 AND MIL-STD-174.

ELECTRICAL SPECIFICATIONS PER TABLE I.
ZENER VOLTAGE (V_Z)
ZENER IMPEDANCE (Z_{ZT})

DESIGN REQUIREMENTS:

MAXIMUM RATINGS:

ZENER CURRENT: 60 ma DC

POWER DISSIPATION: 400 MILLIWATTS (SEE DERATING CURVE)

STORAGE TEMPERATURE: -65°C TO +150°C

TEMPERATURE COEFFICIENT: .002%/°C WITH A ZENER CURRENT OF 7.5 ma.

SPECIAL CONDITIONING BY SUPPLIER:

UNITS SHALL BE BURNED IN FOR 240 HOURS AT THE FOLLOWING CONDITIONS:
1. AMBIENT TEMPERATURE 100°C ±5°C.
2. POWER DISSIPATION: 50% OF THE 100°C CASE TEMPERATURE RATING.

UNITS WHICH FAIL TO MEET ALL INITIAL REQUIREMENTS OR WHICH EXCEED THE SPECIFIED LIMITS FOR PARAMETRIC CHANGES FOLLOWING BURN IN SHALL NOT BE SHIPPED.

THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN IN.
1. ZENER VOLTAGE (V_Z)
2. DYNAMIC IMPEDANCE (Z_{ZT})
3. LEAKAGE CURRENT (I_R)

PARAMETRIC CHANGE LIMITS:
1. ZENER VOLTAGE: ±.05% OF INITIAL MEASURED VALUE
2. DYNAMIC IMPEDANCE: ±5% OF INITIAL MEASURED VALUE
3. LEAKAGE CURRENT: SHALL NOT EXCEED 100% OF INITIAL MEASURED VALUE.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

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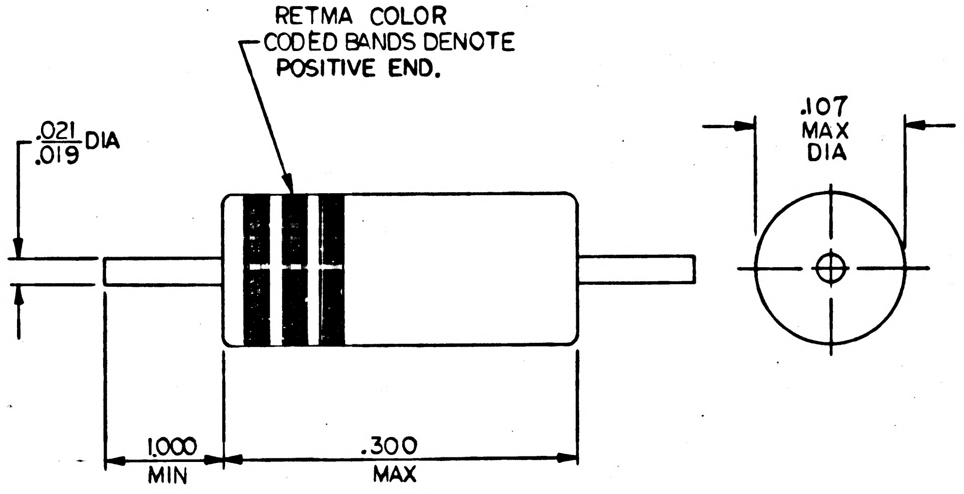
CLASS B RELEASE TDR No. 01450 DATE 6/5/63



SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. Kane DATE 13 May 63
CHECKED 3 June 63
APPROVAL
APPROVAL Eldon C Hall 3 June 63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL L. Nafe 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006838
SCALE NONE WT SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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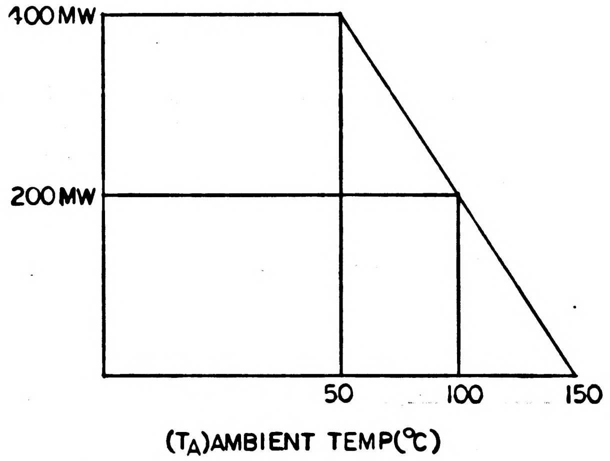
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

TABLE I

ELECTRICAL CHARACTERISTICS AT AMBIENT TEMPERATURE = 25°C (UNLESS OTHERWISE SPECIFIED)					
PARAMETER	CONDITIONS	SYMBOL	SPECIFICATION LIMITS		
			MIN	MAX	UNITS
ZENER VOLTAGE	I_{ZT} = 7.5 MA	V_Z	5.9	6.5	VOLTS
ZENER IMPEDANCE	I_{ZT} = 7.5 MA	Z_{ZT}	-	10	OHMS
ZENER IMPEDANCE	I_{ZK} = 1 MA	Z_{ZK}		200	OHMS
LEAKAGE CURRENT	V_Z = 5.0 VOLTS	I_R		100	ua



DERATING CURVE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01450 DATE 6/5/63

MASTER

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APPLICATION	

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
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DWG. NO. CONTRACT

DRAWN R. Kane DATE 10 May 63
CHECKED 3 June 63
APPROVAL
APPROVAL Eldon C Hall 3 June 63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006838
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006844

SYM	DESCRIPTION	DATE	APPROVAL
—			

REVISIONS

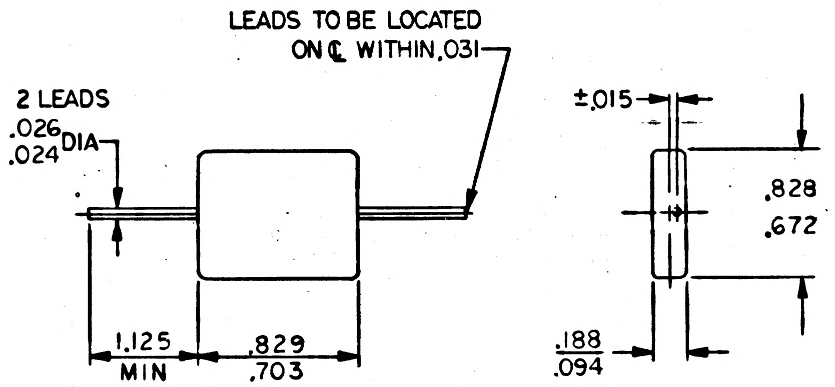
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-11272/2, TYPE CY30C , EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. PACKAGING AND PACKING: LEVEL C (COMMERCIAL PRACTICE): UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED WITH THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
   - E. MARKING: EACH CAPACITOR SHALL BE MARKED PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, AND PART NUMBER AS WELL AS THE CAPACITANCE VALUE, CAPACITANCE TOLERANCE AND WORKING VOLTAGE (CODE IS ACCEPTABLE).
2. ACCEPTANCE AND INSPECTION:
   - A. LEAD MATERIAL SHALL BE "DUMET" PER ND 1015401. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. CAPACITANCE AND TOLERANCE: PER TABLE I.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 200% OF WORKING VOLTAGE IN TABLE I.
3. DESIGN:
   - A. CAPACITANCE CHANGE VERSUS TEMPERATURE: CAPACITANCE SHALL NOT DEVIATE BY MORE THAN 5 PARTS PER MILLION PER DEGREE CENTIGRADE FROM CURVE SPECIFIED IN MIL-C-11272/4.
   - B. TEMPERATURE COEFFICIENT: 140 ± 25 PARTS/MILLION/°C (-55° TO +125°C).
   - C. INSULATION RESISTANCE, LIFE, +125°C: 100,000 MEGOHMS, MINIMUM.
4. SPECIAL CONDITIONING (BY SUPPLIER):
   - A. ALL CAPACITORS SHALL BE BURNED-IN FOR 50 HOURS MINIMUM AT 200% OF RATED WORKING VOLTAGE AT A TEMPERATURE OF +125°C. CAPACITANCE CHANGE AT CONCLUSION OF BURN-IN SHALL NOT EXCEED INITIAL PURCHASE TOLERANCE.

DASH	CAPACITANCE		WORKING VOLTAGE
NUMBER	Pf	TOL (±)	VDC
1	3600	2%	500
2	3900		
3	4300		
4	4700		
5	5100		
6	5600		
7	6200		
8	6800		300
9	7500		
10	8200		
11	9100		
12	10,000		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01276 DATE 15 May 63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT
NONE

FINAL FINISH
NONE

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

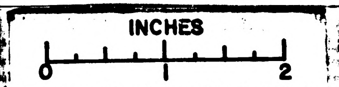
DRAWN R. Kane DATE 14 May 63
CHECKED A. Martz 5-15-63
APPROVAL
APPROVAL Eldon C Hall 5-15-63
NASA APPROVAL
MIT APPROVAL 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CAPACITOR, FIXED,
GLASS DIELECTRIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006844
SCALE NONE
WT
SHEET 1 OF 1

1006844



1006846 A

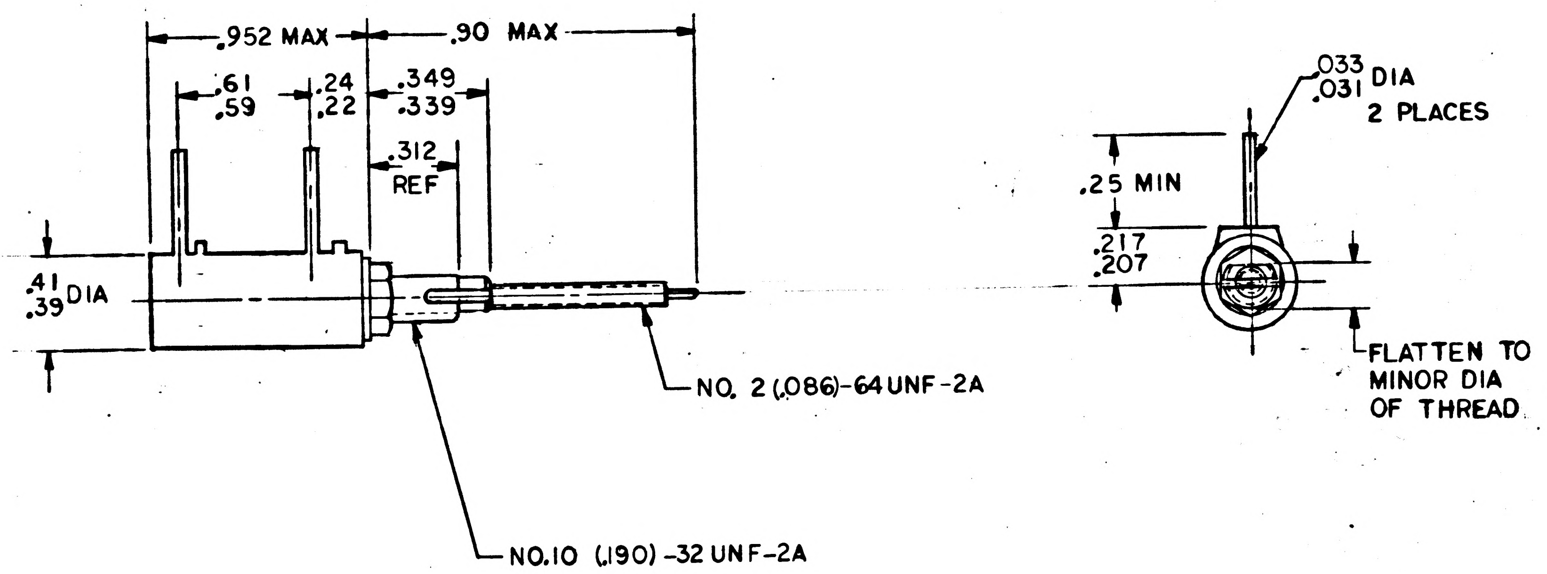
SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS 02821		
A	REVISED PER TDRR. 03037	10 Sep 63	WH

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-15305, TYPE LT4K GRADE T, CLASS B AS MODIFIED BY THE REQUIREMENTS OF THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002060
   - E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE INDUCTANCE VALUE RANGE, DC RESISTANCE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE NUMBER, AND THE NASA PART NUMBER OTHER MARKING BEING PERMISSIBLE.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) TUNING TORQUE: BETWEEN 0.4-9.0 OUNCE-INCHES STARTING AND PREVAILING.
     - (2) LEAD MATERIAL: WELDABLE, FLEXIBLE, GOLD PLATED, IRON-NICKEL ALLOY (DUMET) PER 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE TUNING RANGE: FROM 8 MICROHENRIES TO 13 MICROHENRIES AT 2.5 MEGACYCLES.
     - (2) Q FACTOR: 80 MINIMUM OVER THE ENTIRE RANGE.
     - (3) DC RESISTANCE: 1.4 OHMS MAX.
     - (4) INDUCTANCE - TEMPERATURE COEFFICIENT: ± 50 PPM FROM 0°C TO +70°C.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM AT MAXIMUM CURRENT AND TEMPERATURE RATINGS. THE ADJUSTMENT SCREW SHALL BE CAPABLE OF 500 CYCLES OF OPERATION. ONE CYCLE EQUALS ADJUSTMENT ALL THE WAY IN AND ALL THE WAY OUT.
   - B. CONSTRUCTION: SCREW THREAD BUSHING FOR MOUNTING WITH A PREVAILING TORQUE TYPE OF LOCK FOR TUNING SLUG. BODY OF THE COIL IS ENCAPSULATED IN EPOXY.
   - C. OPERATING TEMPERATURE RANGE: 0°C TO +70°C.
   - D. CURRENT RATING (MAXIMUM): 450 MILLIAMPERES.
   - E. LEAD FATIGUE (EACH LEAD SHALL BE CAPABLE OF MEETING THE PULL AND BEND TEST, HOWEVER THE SAME LEAD SHALL NOT BE TESTED FOR BOTH.
     - PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.
     - BEND TEST: (DESTRUCTIVE): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING TEST: FIVE (5) CYCLES OF 125°C FOR 30 MIN., 25°C FOR 15 MIN., -55°C FOR 30 MIN., AND 25°C FOR 15 MIN. MONITOR THE DC RESISTANCE BEFORE THE FIRST CYCLE, AFTER THE FOURTH CYCLE, AND AFTER THE FIFTH CYCLE. ANY UNIT THAT DEVIATES MORE THAN 4% BETWEEN THE INITIAL MEASUREMENTS AND THAT OF THE FOURTH, OR MORE THAN 2% BETWEEN THE FOURTH AND THE FIFTH, SHALL BE REJECTED. ALL MEASUREMENTS SHALL BE TAKEN WITH THE UNIT AT ROOM TEMPERATURE.

     A CERTIFICATE OF COMPLIANCE WITH THIS TEST MUST ACCOMPANY EACH LOT SHIPPED.



PROCURE ONLY FROM APPROVED SOURCE LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

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APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN H. Bunnice DATE 28 JUNE 63
CHECKED A.J. Magin 18 JUL 63
APPROVAL E.P. Jurell 23 Aug 63
APPROVAL Eldon C Hall 23 Aug 63
NASA APPROVAL Jack Bernard
MIT APPROVAL D Hoag 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, RF, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006846
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B 1006846

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REVISIONS 02821			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR. 03037	10/Sep63	WE
B	REVISED PER TDRR 04188	10-24-63	WR

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-15305, TYPE LT4K GRADE 1, CLASS B AS MODIFIED BY THE REQUIREMENTS OF THIS DRAWING.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002060

   E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE INDUCTANCE VALUE RANGE, DC RESISTANCE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE NUMBER, AND THE NASA PART NUMBER OTHER MARKING BEING PERMISSIBLE.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:

   A. MECHANICAL PROPERTIES:

      (1) TUNING TORQUE: BETWEEN 0.8 - 9.0 OUNCE-INCHES STARTING AND PREVAILING.

      (2) LEAD MATERIAL: WELDABLE, FLEXIBLE, GOLD PLATED, IRON-NICKEL ALLOY (DUMET) PER 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.

   B. ELECTRICAL CHARACTERISTICS:

      (1) INDUCTANCE TUNING RANGE: FROM 8 MICROHENRIES TO 13 MICROHENRIES AT 2.5 MEGACYCLES.

      (2) Q FACTOR: 80 MINIMUM OVER THE ENTIRE RANGE.

      (3) DC RESISTANCE: 1.4 OHMS MAX.

      (4) INDUCTANCE - TEMPERATURE COEFFICIENT: ± 50 PPM FROM 0°C TO +70°C.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS MINIMUM AT MAXIMUM CURRENT AND TEMPERATURE RATINGS. THE ADJUSTMENT SCREW SHALL BE CAPABLE OF 500 CYCLES OF OPERATION. ONE CYCLE EQUALS ADJUSTMENT ALL THE WAY IN AND ALL THE WAY OUT.

   B. CONSTRUCTION: SCREW THREAD BUSHING FOR MOUNTING WITH A PREVAILING TORQUE TYPE OF LOCK FOR TUNING SLUG. BODY OF THE COIL IS ENCAPSULATED IN EPOXY.

   C. OPERATING TEMPERATURE RANGE: 0°C TO +70°C.

   D. CURRENT RATING (MAXIMUM): 450 MILLIAMPERES.

   E. LEAD FATIGUE (EACH LEAD SHALL BE CAPABLE OF MEETING THE PULL AND BEND TEST, HOWEVER THE SAME LEAD SHALL NOT BE TESTED FOR BOTH:

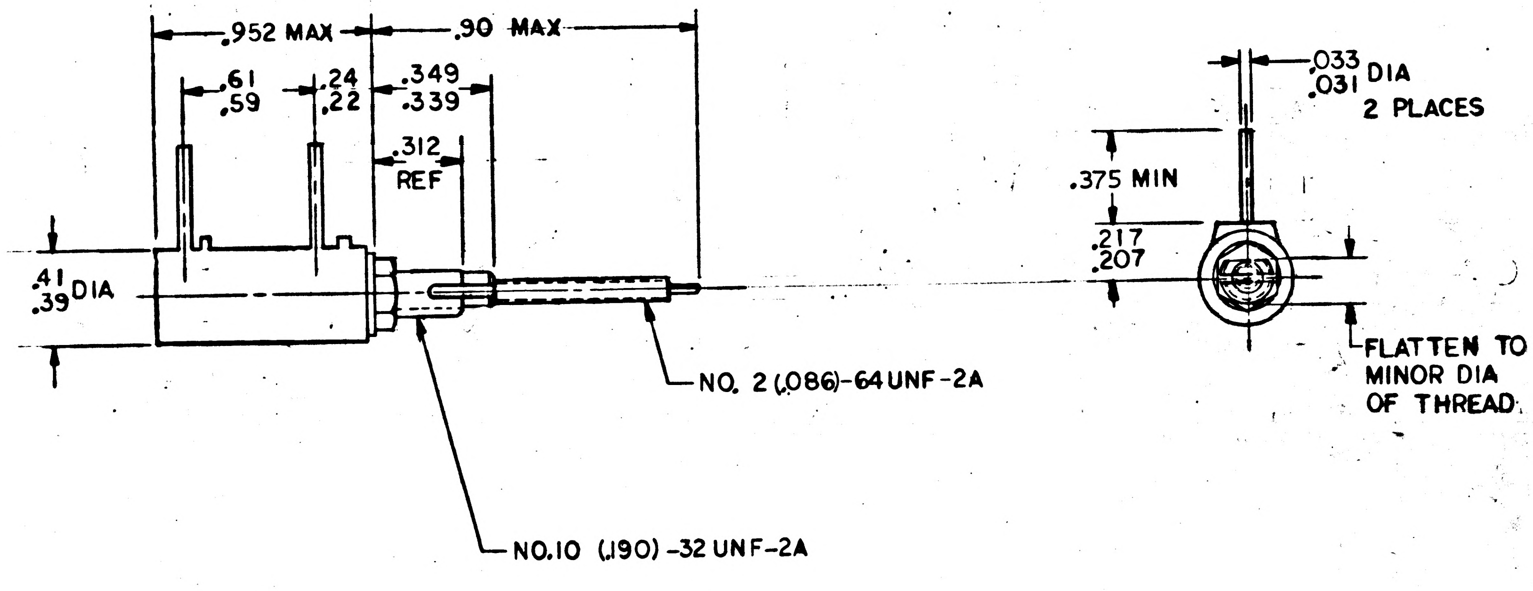
   A. PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

   BEND TEST: (DESTRUCTIVE): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

4. SPECIAL CONDITIONING:

   A. TEMPERATURE CYCLING TEST: FIVE (5) CYCLES OF 125°C FOR 30 MIN., 25°C FOR 15 MIN., -55°C FOR 30 MIN., AND 25°C FOR 15 MIN. MONITOR THE DC RESISTANCE BEFORE THE FIRST CYCLE, AFTER THE FOURTH CYCLE, AND AFTER THE FIFTH CYCLE. ANY UNIT THAT DEVIATES MORE THAN 4% BETWEEN THE INITIAL MEASUREMENTS AND THAT OF THE FOURTH, OR MORE THAN 2% BETWEEN THE FOURTH AND THE FIFTH, SHALL BE REJECTED. ALL MEASUREMENTS SHALL BE TAKEN WITH THE UNIT AT ROOM TEMPERATURE.

   A CERTIFICATE OF COMPLIANCE WITH THIS TEST MUST ACCOMPANY EACH LOT SHIPPED.



PROCURE ONLY FROM APPROVED SOURCE LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

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HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN H. Bunnie DATE 28 June 63
CHECKED A.J. Maganowski 18 July 63
APPROVAL E.E. Russell 23 Aug 63
APPROVAL Ellen C Hall 23 Aug 63
NASA APPROVAL Jack Barnard
MIT APPROVAL D Hoag 10/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, RF, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006846
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
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1006846

REVISIONS 02821

SYM	DESCRIPTION	DATE	APPROVAL

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-15305, TYPE LT4K GRADE 1, CLASS B AS MODIFIED BY THE REQUIREMENTS OF THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002060 (TO BE SPECIFIED)
   - E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE INDUCTANCE VALUE RANGE, DC RESISTANCE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE NUMBER, AND THE NASA PART NUMBER OTHER MARKING BEING PERMISSIBLE.
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     - (2) LEAD MATERIAL: WELDABLE, FLEXIBLE, GOLD PLATED, IRON-NICKEL ALLOY (DUMET) PER 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE TUNING RANGE: FROM 8 MICROHENRIES TO 13 MICROHENRIES AT 2.5 MEGACYCLES.
     - (2) Q FACTOR: 80 MINIMUM OVER THE ENTIRE RANGE.
     - (3) DC RESISTANCE: 1.4 OHMS MAX.
     - (4) INDUCTANCE - TEMPERATURE COEFFICIENT: ± 50 PPM FROM 0°C TO +70°C.
3. DESIGN REQUIREMENTS:
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   - B. CONSTRUCTION: SCREW THREAD BUSHING FOR MOUNTING WITH A PREVAILING TORQUE TYPE OF LOCK FOR TUNING SLUG. BODY OF THE COIL IS ENCAPSULATED IN EPOXY.
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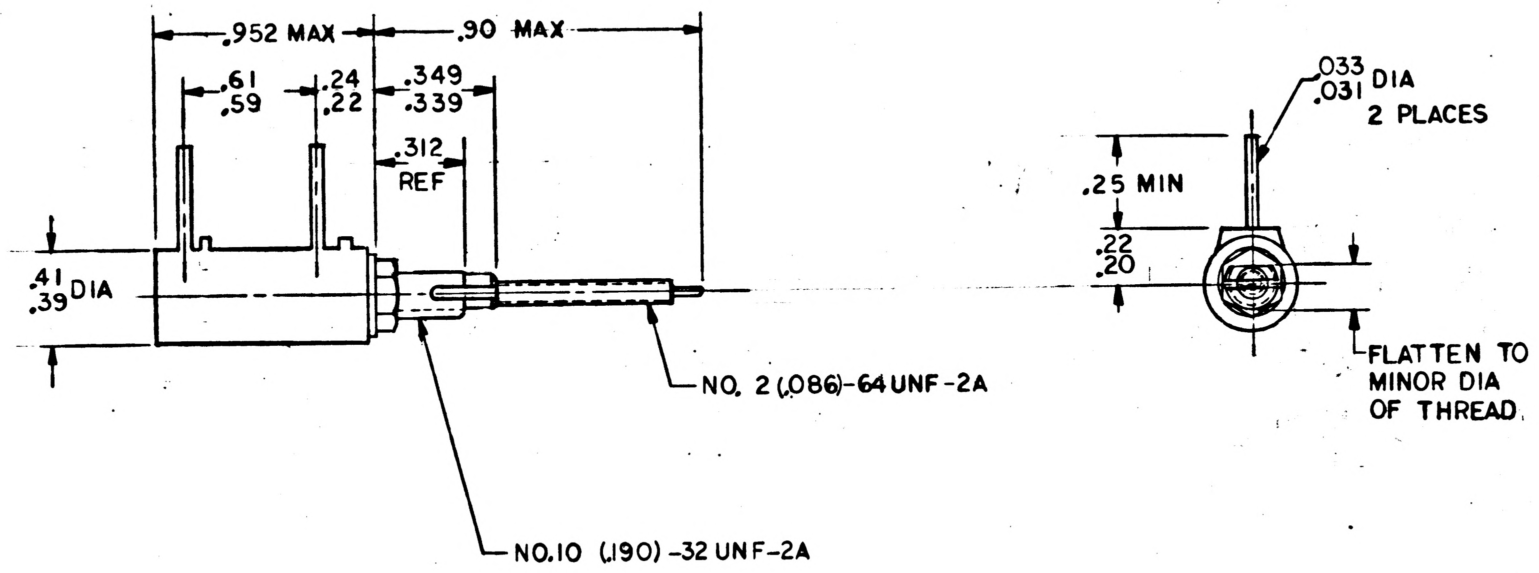
     PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

     BEND TEST: (DESTRUCTIVE): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING TEST: FIVE (5) CYCLES OF 125°C FOR 30 MIN., 25°C FOR 15 MIN., -55°C FOR 30 MIN., AND 25°C FOR 15 MIN. MONITOR THE DC RESISTANCE BEFORE THE FIRST CYCLE, AFTER THE FOURTH CYCLE, AND AFTER THE FIFTH CYCLE. ANY UNIT THAT DEVIATES MORE THAN 4% BETWEEN THE INITIAL MEASUREMENTS AND THAT OF THE FOURTH, OR MORE THAN 2% BETWEEN THE FOURTH AND THE FIFTH, SHALL BE REJECTED. ALL MEASUREMENTS SHALL BE TAKEN WITH THE UNIT AT ROOM TEMPERATURE.

     A CERTIFICATE OF COMPLIANCE WITH THIS TEST MUST ACCOMPANY EACH LOT SHIPPED.



PROCURE ONLY FROM APPROVED SOURCE LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

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APPLICATION

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DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN H. [illegible] DATE 28 JUNE 63
CHECKED A.J. [illegible] 18 JUL 63
APPROVAL [illegible] 23 Aug 63
APPROVAL Ellen C Hall 23 Aug 63
NASA APPROVAL Jack [illegible]
MIT APPROVAL [illegible] 8/28/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, RF, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006846
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

4 3 2 1

A	1006847

REVISIONS TDRR 03167

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03/67	9/17/63	DW
A	REVISED PER TDRR 04005	17 Oct 63	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-3098 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015401, CLASS 2.

D. PACKAGING AND PACKING: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-C-3098, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION: INSPECTION AND TEST PROCEDURE SHALL BE IN ACCORDANCE WITH

A. MECHANICAL REQUIREMENTS:

(1) MARKING: SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

(a) PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 BOTH INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

(b) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, SERIAL NUMBER, DATE OF MANUFACTURE, NOMINAL FREQUENCY AND TURN-OVER TEMPERATURE.

(2) DIMENSIONS: IN ACCORDANCE WITH OUTLINE. 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS REQUIREMENT.

(3) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(4) LEAD TENSION: LEADS SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AS A RESULT OF THIS TEST. SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

(5) [illegible]

(5) CRYSTAL MOUNTING: THE CRYSTAL MOUNTING SHALL BE RUGGEDIZED TO ENABLE UNIT TO MEET THE REQUIREMENTS SPECIFIED HEREIN.

(6) HEADER: GLASS, VACUUM SEALED. NO STRAIN IN HEADER SHALL BE VISIBLE WHEN INSPECTED UNDER POLARIZED LIGHT. THIS EXAMINATION SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

(7) ENVELOPE: CLEAR GLASS. NO STRAIN IN GLASS ENVELOPE SHALL BE VISIBLE WHEN INSPECTED UNDER POLARIZED LIGHT. THIS EXAMINATION SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

(8) MICROSCOPIC INSPECTION: WHEN UNITS ARE MICROSCOPICALLY INSPECTED UNDER 10X MAGNIFICATION, NO MARKINGS OR SCRATCHES IN THE CRYSTAL PLATING, OR CHIPS ON THE EDGES OF THE CRYSTAL SHALL BE VISIBLE. THIS INSPECTION SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

B. ELECTRICAL CHARACTERISTICS: THE FOLLOWING ELECTRICAL CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED. THE TEST SHALL BE PERFORMED WITH 50 MICROWATTS MAX DRIVE AND 25 PLUS OR MINUS 1 DEGREE CENTIGRADE UNLESS OTHERWISE SPECIFIED.

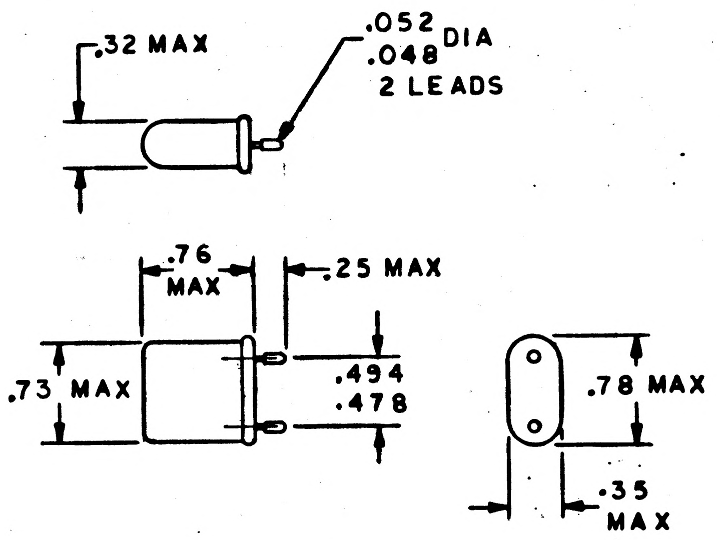
(1) FREQUENCY: 2.048000 MEGACYCLES PLUS OR MINUS .001 PERCENT, CALIBRATED IN A STANDARD 330 CI METER AT 80 MICROMICROFARADS LOAD CAPACITANCE.

(2) SERIES RESISTANCE: 30 OHMS MAXIMUM FROM ZERO DEGREES CENTIGRADE TO 85 DEGREES CENTIGRADE; 50 OHMS MAXIMUM FROM MINUS 20 DEGREES CENTIGRADE TO ZERO DEGREES CENTIGRADE.

(3) MOTIONAL CAPACITANCE: C_1 = .01296 uuf PLUS OR MINUS 5 PERCENT.

(4) SHUNT CAPACITANCE: C_0 = 5 PICOFARADS PLUS OR MINUS 1 PICOFARAD.

(5) TEMPERATURE CHARACTERISTIC: TURN-OVER TEMPERATURE SHALL BE 65 DEGREES CENTIGRADE PLUS OR MINUS 2°C DEGREES CENTIGRADE. MAXIMUM FREQUENCY DEVIATION SHALL BE LESS THAN 12 PARTS PER MILLION OVER THE TEMP RANGE OF 0°C + 70°C.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [illegible] DATE 20 Aug 63
CHECKED J. Ruggen [illegible]
APPROVAL
APPROVAL Eldon C Hall 13 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL R Hazel 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 1 OF 2

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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1006847 A

REVISIONS 03167

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 04005	17Oct63	WK

2C. ACCEPTANCE INSPECTION:

B. ELECTRICAL CHARACTERISTICS: CONTINUED

(6)

REQUIREMENT 3.B.(1). ALL TEMPERATURES SHALL BE HELD WITHIN PLUS OR MINUS 3 DEGREES CEN

3. DESIGN REQUIREMENTS:

A. SHELF LIFE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER ONE YEAR OF UNPACKAGED STORAGE UNDER THE FOLLOWING CONDITIONS: RELATIVE HUMIDITY UP TO 95 PERCENT, TEMPERATURES AS LOW AS MINUS 18 DEGREES CENTIGRADE OR AS HIGH AS PLUS 52 DEGREES CENTIGRADE, AND AT ALTITUDES AS HIGH AS 10,000 FEET. IT SHALL BE ASSUMED THAT THE UNITS WILL BE EXPOSED TO AMBIENT ATMOSPHERE DURING THE ONE YEAR PERIOD.

B. PACKAGED STORAGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER 3 YEARS OF DEAD STORAGE WHEN PACKAGED FOR OVERSEAS SHIPMENT IN ACCORDANCE WITH SPECIFICATION JAN-P-100-1. ENVIRONMENTAL CONDITIONS FOR PACKAGED STORAGE SHALL BE AS INDICATED FOR ALL NON-OPERATING CONDITIONS SPECIFIED ABOVE EXCEPT THE STORAGE TEMPERATURE MAY BE AS HIGH AS PLUS 71 DEGREES CENTIGRADE OR AS LOW AS MINUS 40 DEGREES CENTIGRADE, THERE MAY BE VIBRATORY ACCELERATION FOR PERIODS OF 25 HOURS OF 1.0G FROM 2 TO 30 CYCLES PER SECOND AND THERE MAY BE OCCASIONAL SHOCKS UP TO 10G.

C. SPURIOUS MODES: ALL SPURIOUS MODES SHALL BE AT LEAST 3.5 DECIBELS DOWN FOR PLUS OR MINUS 100 KILOCYCLES FROM THE DRIVE LEVEL AT 2.048 MEGACYCLES OVER THE TEMPERATURE RANGE FROM ZERO DEGREES CENTIGRADE TO PLUS 85 DEGREES CENTIGRADE.

D. CRYSTAL ELEMENT: QUARTZ, "AT" CUT, GOLD OR ALUMINUM PLATED. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

E. ENVIRONMENTAL REQUIREMENTS: UNITS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING ENVIRONMENTAL TESTS. MECHANICAL TESTS (VIBRATION, SHOCK AND ACCELERATION) SHALL BE CONDUCTED WITH THE UNIT MOUNTED BY MEANS OF AN APPROPRIATE FIXTURE WITH THE BODY RESTRAINED FROM MOVEMENT.

(1) VIBRATION: WHILE OPERATING FROM 15 TO 31 CYCLES PER SECOND AT 0.2 INCH DOUBLE AMPLITUDE; FROM 31 TO 2,000 CYCLES PER SECOND AT PLUS OR MINUS 10G. FREQUENCY CHANGE DURING VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^7. A RESONANCE SEARCH SHALL BE MADE THROUGHOUT THE FREQUENCY RANGE SPECIFIED AND A 15 MINUTE FATIGUE VIBRATION TEST SHALL BE PERFORMED AT EACH MAJOR RESONANCE. PERMANENT FREQUENCY CHANGE AFTER VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^8.

(2) MECHANICAL SHOCK: WHILE OPERATING, 50G FOR 11 MILLISECONDS PLUS OR MINUS ONE (1) MILLISECOND DURATION SIMILAR TO THAT OBTAINED WITH A BARRY TYPE SHOCK MACHINE PER MIL-S-4456. 3 SHOCKS IN EACH OF THE 3 MUTUALLY PERPENDICULAR PLANES FOR A TOTAL OF 18 SHOCKS. PERMANENT FREQUENCY CHANGE AFTER SHOCK SHALL BE NO GREATER THAN PLUS OR MINUS 2 PARTS PER 10^8.

(3) ACCELERATION: WHILE OPERATING AND NON-OPERATING, PLUS OR MINUS 20G IN ANY DIRECTION FOR 5 MINUTES. PERMANENT FREQUENCY CHANGE AFTER ACCELERATION SHALL BE NO GREATER THAN 1 PART PER 10^8.

F.

G. AGING: PLUS 1 PART PER 10^8 PER WEEK MAXIMUM AT PLUS 60 DEGREES CENTIGRADE 50 MICROWATTS CRYSTAL DRIVE.

(1) TEMPERATURE SHOCK: MINUS 40 DEGREES CENTIGRADE FOR 30 MINUTES AND PLUS 85 DEGREES CENTIGRADE FOR 30 MINUTES. TIME INTERVAL CHANGING FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 15 SECONDS. PERMANENT FREQUENCY CHANGE AFTER TEMPERATURE SHOCK SHALL BE NO GREATER THAN 1 PART 10^7.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 12 Sept 63
CHECKED 12 Sept 63
APPROVAL
APPROVAL Eldon C Hall 13 Sept 63
NASA APPROVAL
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006847
SCALE NONE	WT	SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B | 1006847

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REVISIONS TDRR 03167			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03/67	9/17/63	DW
A	REVISED PER TDRR 04005	17 Oct 63	WK
B	REVISED PER TDRR 06010	2/4/64	FPK WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-3098 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015401, CLASS 2.

   D. PACKAGING AND PACKING: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-C-3098, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION: INSPECTION AND TEST PROCEDURE SHALL BE IN ACCORDANCE WITH

   A. MECHANICAL REQUIREMENTS:

      (1) MARKING: SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

         (a) PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 BOTH INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

         (b) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, SERIAL NUMBER, DATE OF MANUFACTURE, NOMINAL FREQUENCY AND TURN-OVER TEMPERATURE.

      (2) DIMENSIONS: IN ACCORDANCE WITH OUTLINE. 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS REQUIREMENT.

      (3) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (4) LEAD TENSION: LEADS SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AS A RESULT OF THIS TEST. SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

      (5) CRYSTAL MOUNTING: THE CRYSTAL MOUNTING SHALL BE RUGGEDIZED TO ENABLE UNIT TO MEET THE REQUIREMENTS SPECIFIED HEREIN.

   B. ELECTRICAL CHARACTERISTICS: THE FOLLOWING ELECTRICAL CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED. THE TEST SHALL BE PERFORMED WITH 50 MICROWATTS MAX DRIVE AND 25 PLUS OR MINUS 1 DEGREE CENTIGRADE UNLESS OTHERWISE SPECIFIED.

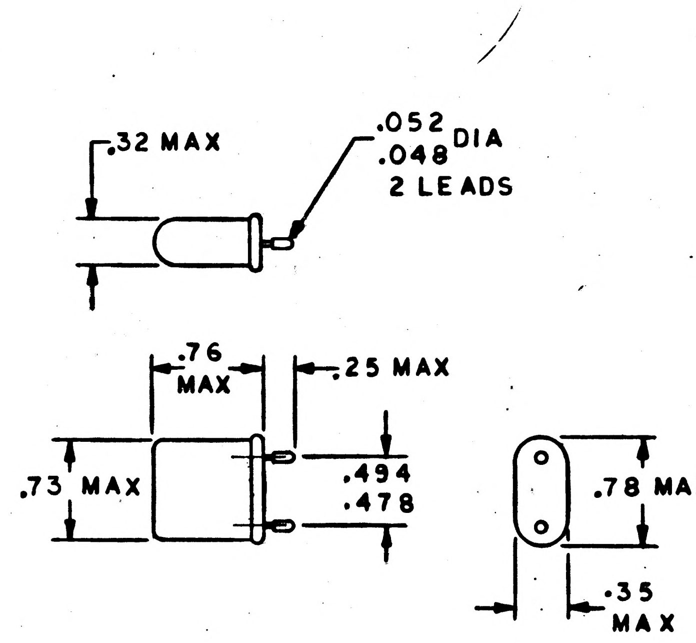
      (1) FREQUENCY: 2.048000 MEGACYCLES PLUS OR MINUS .001 PERCENT, CALIBRATED IN A STANDARD 330 CI METER AT 80 MICROMICROFARADS LOAD CAPACITANCE.

      (2) SERIES RESISTANCE: 30 OHMS MAXIMUM FROM ZERO DEGREES CENTIGRADE TO 85 DEGREES CENTIGRADE; 50 OHMS MAXIMUM FROM MINUS 20 DEGREES CENTIGRADE TO ZERO DEGREES CENTIGRADE.

      (3) MOTIONAL CAPACITANCE: C_1 = .01296 uuf PLUS 5% MINUS 10%

      (4) SHUNT CAPACITANCE: C_0 = 5 PICOFARADS PLUS OR MINUS 1 PICOFARAD.

      (5) TEMPERATURE CHARACTERISTIC: TURN-OVER TEMPERATURE SHALL BE BETWEEN 61 DEGREES CENTIGRADE AND 65 DEGREES CENTIGRADE PLUS OR MINUS 2°C DEGREES CENTIGRADE. MAXIMUM FREQUENCY DEVIATION SHALL BE LESS THAN 12 PARTS PER MILLION OVER THE TEMP RANGE OF 0°C + 70°C.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SHEET 1	SHEET 2
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REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
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DWG. NO. CONTRACT
DRAWN DATE 7 Aug 63
CHECKED J. Ruggen
APPROVAL
APPROVAL Eldon C Hall 13 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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B 1006847

REVISIONS 03167			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 04005	17Oct63	WK
B	REVISED PER TDRR 06010	2/4/64	RPK WK

REQUIREMENT 3.B.(1). ALL TEMPERATURES SHALL BE HELD WITHIN PLUS OR MINUS 3 DEGREES CEN

3. DESIGN REQUIREMENTS:

A. SHELF LIFE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER ONE YEAR OF UNPACKAGED STORAGE UNDER THE FOLLOWING CONDITIONS: RELATIVE HUMIDITY UP TO 95 PERCENT, TEMPERATURES AS LOW AS MINUS 18 DEGREES CENTIGRADE OR AS HIGH AS PLUS 52 DEGREES CENTIGRADE, AND AT ALTITUDES AS HIGH AS 10,000 FEET. IT SHALL BE ASSUMED THAT THE UNITS WILL BE EXPOSED TO AMBIENT ATMOSPHERE DURING THE ONE YEAR PERIOD.

B. PACKAGED STORAGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER 3 YEARS OF DEAD STORAGE WHEN PACKAGED FOR OVERSEAS SHIPMENT IN ACCORDANCE WITH SPECIFICATION JAN-P-100-1. ENVIRONMENTAL CONDITIONS FOR PACKAGED STORAGE SHALL BE AS INDICATED FOR ALL NON-OPERATING CONDITIONS SPECIFIED ABOVE EXCEPT THE STORAGE TEMPERATURE MAY BE AS HIGH AS PLUS 71 DEGREES CENTIGRADE OR AS LOW AS MINUS 40 DEGREES CENTIGRADE, THERE MAY BE VIBRATORY ACCELERATION FOR PERIODS OF 25 HOURS OF 1.0G FROM 2 TO 30 CYCLES PER SECOND AND THERE MAY BE OCCASIONAL SHOCKS UP TO 10G.

C. SPURIOUS MODES: ALL SPURIOUS MODES SHALL BE AT LEAST 3.5 DECIBELS DOWN FOR PLUS OR MINUS 100 KILOCYCLES FROM THE DRIVE LEVEL AT 2.048 MEGACYCLES OVER THE TEMPERATURE RANGE FROM ZERO DEGREES CENTIGRADE TO PLUS 85 DEGREES CENTIGRADE.

D. CRYSTAL ELEMENT: QUARTZ, "AT" CUT, GOLD OR ALUMINUM PLATED. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

E. ENVIRONMENTAL REQUIREMENTS: UNITS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING ENVIRONMENTAL TESTS. MECHANICAL TESTS (VIBRATION, SHOCK AND ACCELERATION) SHALL BE CONDUCTED WITH THE UNIT MOUNTED BY MEANS OF AN APPROPRIATE FIXTURE WITH THE BODY RESTRAINED FROM MOVEMENT.

(1) VIBRATION: WHILE OPERATING FROM 15 TO 31 CYCLES PER SECOND AT 0.2 INCH DOUBLE AMPLITUDE; FROM 31 TO 2,000 CYCLES PER SECOND AT PLUS OR MINUS 10G. FREQUENCY CHANGE DURING VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^7. A RESONANCE SEARCH SHALL BE MADE THROUGHOUT THE FREQUENCY RANGE SPECIFIED AND A 15 MINUTE FATIGUE VIBRATION TEST SHALL BE PERFORMED AT EACH MAJOR RESONANCE. PERMANENT FREQUENCY CHANGE AFTER VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^8.

(2) MECHANICAL SHOCK: WHILE OPERATING, 50G FOR 11 MILLISECONDS PLUS OR MINUS ONE (1) MILLISECOND DURATION SIMILAR TO THAT OBTAINED WITH A BARRY TYPE SHOCK MACHINE PER MIL-STD-202 3 SHOCKS IN EACH OF THE 3 MUTUALLY PERPENDICULAR PLANES FOR A TOTAL OF 18 SHOCKS. PERMANENT FREQUENCY CHANGE AFTER SHOCK SHALL BE NO GREATER THAN PLUS OR MINUS 2 PARTS PER 10^8.

(3) ACCELERATION: WHILE OPERATING AND NON-OPERATING, PLUS OR MINUS 20G IN ANY DIRECTION FOR 5 MINUTES. PERMANENT FREQUENCY CHANGE AFTER ACCELERATION SHALL BE NO GREATER THAN 1 PART PER 10^8.

F.

G. AGING: PLUS 1 PART PER 10^8 PER WEEK MAXIMUM AT PLUS 60 DEGREES CENTIGRADE 50 MICROWATTS CRYSTAL DRIVE.

(1) TEMPERATURE SHOCK: MINUS 40 DEGREES CENTIGRADE FOR 30 MINUTES AND PLUS 85 DEGREES CENTIGRADE FOR 30 MINUTES. TIME INTERVAL CHANGING FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 15 SECONDS. PERMANENT FREQUENCY CHANGE AFTER TEMPERATURE SHOCK SHALL BE NO GREATER THAN 1 PART 10^7.

MASTER

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LIST OF MATERIALS

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INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 12 Sept 63
CHECKED 12 Sept 63
APPROVAL
APPROVAL Elden C Hall 13 Sept 63
NASA APPROVAL
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 2 OF 2

INCHES
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1006847 C

REVISIONS TDRR 03167

SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03167	9/17/63	
A	REVISED PER TDRR 04005	17 Oct 63	WK
B	REVISED PER TDRR 06010	2/4/64	PPK WK
C	REVISED PER TDRR 13665	4/14/64	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-3098 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015401, CLASS 2.

   D. PACKAGING AND PACKING: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-C-3098, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION: INSPECTION AND TEST PROCEDURE SHALL BE IN ACCORDANCE WITH

   A. MECHANICAL REQUIREMENTS:

      (1) MARKING: SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

         (a) PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 BOTH INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

         (b) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, SERIAL NUMBER, DATE OF MANUFACTURE, NOMINAL FREQUENCY AND TURN-OVER TEMPERATURE.

      (2) DIMENSIONS: IN ACCORDANCE WITH OUTLINE. 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS REQUIREMENT.

      (3) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (4) LEAD TENSION: LEADS SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AS A RESULT OF THIS TEST. SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

      (5) CRYSTAL MOUNTING: THE CRYSTAL MOUNTING SHALL BE RUGGEDIZED TO ENABLE UNIT TO MEET THE REQUIREMENTS SPECIFIED HEREIN.

   B. ELECTRICAL CHARACTERISTICS: THE FOLLOWING ELECTRICAL CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED. THE TEST SHALL BE PERFORMED WITH 50 MICROWATTS MAX DRIVE AND 25 PLUS OR MINUS 1 DEGREE CENTIGRADE UNLESS OTHERWISE SPECIFIED.

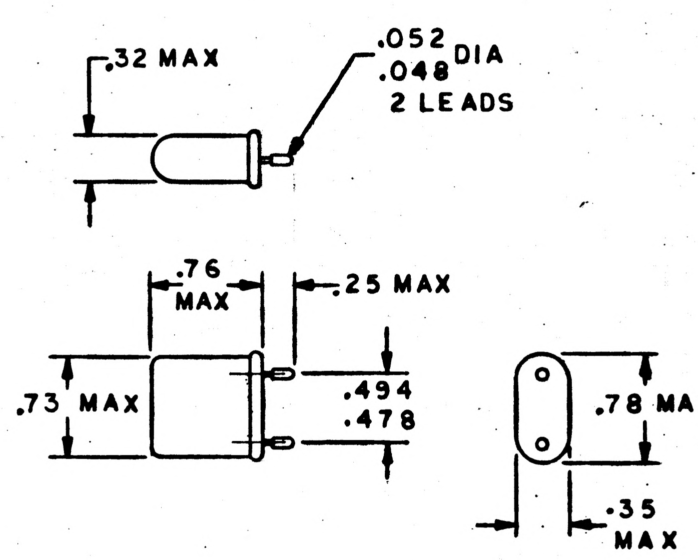
      (1) FREQUENCY: 2.048000 MEGACYCLES PLUS OR MINUS .001 PERCENT, CALIBRATED IN A STANDARD 330 CI METER AT 80 MICROMICROFARADS LOAD CAPACITANCE.

      (2) SERIES RESISTANCE: 30 OHMS MAXIMUM FROM ZERO DEGREES CENTIGRADE TO 85 DEGREES CENTIGRADE; 50 OHMS MAXIMUM FROM MINUS 20 DEGREES CENTIGRADE TO ZERO DEGREES CENTIGRADE.

      (3) MOTIONAL CAPACITANCE: C_1 = .01296 uuf PLUS 5% MINUS 10%

      (4) SHUNT CAPACITANCE: C_0 = 5 PICOFARADS PLUS OR MINUS 1 PICOFARAD.

      (5) TEMPERATURE CHARACTERISTIC: TURN-OVER TEMPERATURE SHALL BE BETWEEN 63 DEGREES CENTIGRADE AND 67 DEGREES CENTIGRADE. MAXIMUM FREQUENCY DEVIATION SHALL BE LESS THAN 15 PARTS PER MILLION OVER THE TEMP RANGE OF −10°C TO +70°C



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 7 Aug 63
CHECKED J. Ruggeri
APPROVAL
APPROVAL Eldon C Hall 13 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 1 OF 2

MASTE

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

C | 1006847

REVISIONS 03167

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 04005	17Oct63	WK
B	REVISED PER TDRR 06010	2/4/64	RPK WK
C	REVISED PER TDRR 13665	4/14/64	WK

REQUIREMENT 3.B.(1). ALL TEMPERATURES SHALL BE HELD WITHIN PLUS OR MINUS 3 DEGREES CEN

3. DESIGN REQUIREMENTS:

A. SHELF LIFE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER ONE YEAR OF UNPACKAGED STORAGE UNDER THE FOLLOWING CONDITIONS: RELATIVE HUMIDITY UP TO 95 PERCENT, TEMPERATURES AS LOW AS MINUS 18 DEGREES CENTIGRADE OR AS HIGH AS PLUS 52 DEGREES CENTIGRADE, AND AT ALTITUDES AS HIGH AS 10,000 FEET. IT SHALL BE ASSUMED THAT THE UNITS WILL BE EXPOSED TO AMBIENT ATMOSPHERE DURING THE ONE YEAR PERIOD.

B. PACKAGED STORAGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER 3 YEARS OF DEAD STORAGE WHEN PACKAGED FOR OVERSEAS SHIPMENT IN ACCORDANCE WITH SPECIFICATION JAN-P-100-1. ENVIRONMENTAL CONDITIONS FOR PACKAGED STORAGE SHALL BE AS INDICATED FOR ALL NON-OPERATING CONDITIONS SPECIFIED ABOVE EXCEPT THE STORAGE TEMPERATURE MAY BE AS HIGH AS PLUS 71 DEGREES CENTIGRADE OR AS LOW AS MINUS 40 DEGREES CENTIGRADE, THERE MAY BE VIBRATORY ACCELERATION FOR PERIODS OF 25 HOURS OF 1.0G FROM 2 TO 30 CYCLES PER SECOND AND THERE MAY BE OCCASIONAL SHOCKS UP TO 10G.

C. SPURIOUS MODES: ALL SPURIOUS MODES SHALL BE AT LEAST 3.5 DECIBELS DOWN FOR PLUS OR MINUS 100 KILOCYCLES FROM THE DRIVE LEVEL AT 2.048 MEGACYCLES OVER THE TEMPERATURE RANGE FROM ZERO DEGREES CENTIGRADE TO PLUS 85 DEGREES CENTIGRADE.

D. CRYSTAL ELEMENT: QUARTZ, "AT" CUT, GOLD OR ALUMINUM PLATED. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

E. ENVIRONMENTAL REQUIREMENTS: UNITS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING ENVIRONMENTAL TESTS. MECHANICAL TESTS (VIBRATION, SHOCK AND ACCELERATION) SHALL BE CONDUCTED WITH THE UNIT MOUNTED BY MEANS OF AN APPROPRIATE FIXTURE WITH THE BODY RESTRAINED FROM MOVEMENT.

(1) VIBRATION: WHILE OPERATING FROM 15 TO 31 CYCLES PER SECOND AT 0.2 INCH DOUBLE AMPLITUDE; FROM 31 TO 2,000 CYCLES PER SECOND AT PLUS OR MINUS 10G. FREQUENCY CHANGE DURING VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^7. A RESONANCE SEARCH SHALL BE MADE THROUGHOUT THE FREQUENCY RANGE SPECIFIED AND A 15 MINUTE FATIGUE VIBRATION TEST SHALL BE PERFORMED AT EACH MAJOR RESONANCE. PERMANENT FREQUENCY CHANGE AFTER VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^8.

(2) MECHANICAL SHOCK: WHILE OPERATING, 50G FOR 11 MILLISECONDS PLUS OR MINUS ONE (1) MILLISECOND DURATION SIMILAR TO THAT OBTAINED WITH A BARRY TYPE SHOCK MACHINE PER MIL-STD-202 3 SHOCKS IN EACH OF THE 3 MUTUALLY PERPENDICULAR PLANES FOR A TOTAL OF 18 SHOCKS. PERMANENT FREQUENCY CHANGE AFTER SHOCK SHALL BE NO GREATER THAN PLUS OR MINUS 2 PARTS PER 10^8.

(3) ACCELERATION: WHILE OPERATING AND NON-OPERATING, PLUS OR MINUS 20G IN ANY DIRECTION FOR 5 MINUTES. PERMANENT FREQUENCY CHANGE AFTER ACCELERATION SHALL BE NO GREATER THAN 1 PART PER 10^8.

F.

G. AGING: PLUS 1 PART PER 10^8 PER WEEK MAXIMUM AT PLUS 60 DEGREES CENTIGRADE 50 MICROWATTS CRYSTAL DRIVE.

(1) TEMPERATURE SHOCK: MINUS 40 DEGREES CENTIGRADE FOR 30 MINUTES AND PLUS 85 DEGREES CENTIGRADE FOR 30 MINUTES. TIME INTERVAL CHANGING FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 15 SECONDS. PERMANENT FREQUENCY CHANGE AFTER TEMPERATURE SHOCK SHALL BE NO GREATER THAN 1 PART 10^7.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

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INSTRUMENTATION LAB
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DWG. NO. CONTRACT
DRAWN Ray Whalen DATE 12 Sept 63
CHECKED J. Ruggeri / W. Winfield 12 Sept 63
APPROVAL
APPROVAL Eldon C Hall 13 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL L. Hazel 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS TDRR 03167			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03167	9/17/63	[illegible]
A	REVISED PER TDRR 04005	17 Oct 63	WK
B	REVISED PER TDRR 06010	2/4/64	FPK WK
C	REVISED PER TDRR 13665	4 Nov 64	WK
D	REVISED PER TDRR 21589	8/31/65	WK

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-3098 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

   C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015401, CLASS 2.

   D. PACKAGING AND PACKING: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-C-3098, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION: INSPECTION AND TEST PROCEDURE SHALL BE IN ACCORDANCE WITH

   A. MECHANICAL REQUIREMENTS:

      (1) MARKING: SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

         (a) PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 BOTH INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

         (b) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, SERIAL NUMBER, DATE OF MANUFACTURE, NOMINAL FREQUENCY AND TURN-OVER TEMPERATURE.

      (2) DIMENSIONS: IN ACCORDANCE WITH OUTLINE. 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS REQUIREMENT.

      (3) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

      (4) CRYSTAL MOUNTING: THE CRYSTAL MOUNTING SHALL BE RUGGEDIZED TO ENABLE UNIT TO MEET THE REQUIREMENTS SPECIFIED HEREIN.

   B. ELECTRICAL CHARACTERISTICS: THE FOLLOWING ELECTRICAL CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED. THE TEST SHALL BE PERFORMED WITH 50 MICROWATTS MAX DRIVE AND 25 PLUS OR MINUS 1 DEGREE CENTIGRADE UNLESS OTHERWISE SPECIFIED.

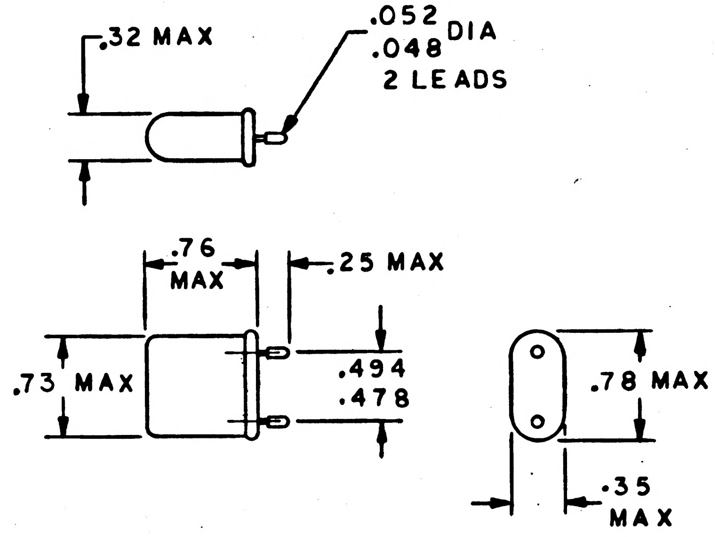
      (1) FREQUENCY: 2.048000 MEGACYCLES PLUS OR MINUS .001 PERCENT, CALIBRATED IN A STANDARD 330 CI METER AT 80 MICROMICROFARADS LOAD CAPACITANCE.

      (2) SERIES RESISTANCE: 30 OHMS MAXIMUM FROM ZERO DEGREES CENTIGRADE TO 85 DEGREES CENTIGRADE; 50 OHMS MAXIMUM FROM MINUS 20 DEGREES CENTIGRADE TO ZERO DEGREES CENTIGRADE.

      (3) MOTIONAL CAPACITANCE: C_1 = .01296 uuf PLUS 5% MINUS 10%

      (4) SHUNT CAPACITANCE: C_0 = 5 PICOFARADS PLUS OR MINUS 1 PICOFARAD.

      (5) TEMPERATURE CHARACTERISTIC: TURN-OVER TEMPERATURE SHALL BE BETWEEN 63 DEGREES CENTIGRADE AND 67 DEGREES CENTIGRADE. MAXIMUM FREQUENCY DEVIATION SHALL BE LESS THAN 15 PARTS PER MILLION OVER THE TEMP RANGE OF -10°C TO +70°C



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS			

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 7 Aug 63
CHECKED J. Ruggiero 28 Aug 63
APPROVAL
APPROVAL Eldon C Hall 13 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL [illegible] 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 1 OF 2

MASTE

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REQUIREMENT 3.B.(1). ALL [illegible]
[illegible] OR MINUS 3 [illegible]

3. DESIGN REQUIREMENTS:

A. SHELF LIFE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER ONE YEAR OF UNPACKAGED STORAGE UNDER THE FOLLOWING CONDITIONS: RELATIVE HUMIDITY UP TO 95 PERCENT, TEMPERATURES AS LOW AS MINUS 18 DEGREES CENTIGRADE OR AS HIGH AS PLUS 52 DEGREES CENTIGRADE, AND AT ALTITUDES AS HIGH AS 10,000 FEET. IT SHALL BE ASSUMED THAT THE UNITS WILL BE EXPOSED TO AMBIENT ATMOSPHERE DURING THE ONE YEAR PERIOD.

B. PACKAGED STORAGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER 3 YEARS OF DEAD STORAGE WHEN PACKAGED FOR OVERSEAS SHIPMENT IN ACCORDANCE WITH SPECIFICATION JAN-P-100-1. ENVIRONMENTAL CONDITIONS FOR PACKAGED STORAGE SHALL BE AS INDICATED FOR ALL NON-OPERATING CONDITIONS SPECIFIED ABOVE EXCEPT THE STORAGE TEMPERATURE MAY BE AS HIGH AS PLUS 71 DEGREES CENTIGRADE OR AS LOW AS MINUS 40 DEGREES CENTIGRADE, THERE MAY BE VIBRATORY ACCELERATION FOR PERIODS OF 25 HOURS OF 1.0G FROM 2 TO 30 CYCLES PER SECOND AND THERE MAY BE OCCASIONAL SHOCKS UP TO 10G.

C. LEAD TENSION: LEADS SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AS A RESULT OF THIS TEST. SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

D. SPURIOUS MODES: ALL SPURIOUS MODES SHALL BE AT LEAST 3.5 DECIBELS DOWN FOR PLUS OR MINUS 100 KILOCYCLES FROM THE DRIVE LEVEL AT 2.048 MEGACYCLES OVER THE TEMPERATURE RANGE FROM ZERO DEGREES CENTIGRADE TO PLUS 85 DEGREES CENTIGRADE.

E. CRYSTAL ELEMENT: QUARTZ, "AT" CUT, GOLD OR ALUMINUM PLATED. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

F. ENVIRONMENTAL REQUIREMENTS: UNITS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING ENVIRONMENTAL TESTS. MECHANICAL TESTS (VIBRATION, SHOCK AND ACCELERATION) SHALL BE CONDUCTED WITH THE UNIT MOUNTED BY MEANS OF AN APPROPRIATE FIXTURE WITH THE BODY RESTRAINED FROM MOVEMENT.

(1) VIBRATION: WHILE OPERATING FROM 15 TO 31 CYCLES PER SECOND AT 0.2 INCH DOUBLE AMPLITUDE: FROM 31 TO 2,000 CYCLES PER SECOND AT PLUS OR MINUS 10G. FREQUENCY CHANGE DURING VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^7. A RESONANCE SEARCH SHALL BE MADE THROUGHOUT THE FREQUENCY RANGE SPECIFIED AND A 15 MINUTE FATIGUE VIBRATION TEST SHALL BE PERFORMED AT EACH MAJOR RESONANCE. PERMANENT FREQUENCY CHANGE AFTER VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^8.

(2) MECHANICAL SHOCK: WHILE OPERATING, 50G FOR 11 MILLISECONDS PLUS OR MINUS ONE (1) MILLISECOND DURATION SIMILAR TO THAT OBTAINED WITH A BARRY TYPE SHOCK MACHINE PER MIL-STD-202 3 SHOCKS IN EACH OF THE 3 MUTUALLY PERPENDICULAR PLANES FOR A TOTAL OF 18 SHOCKS. PERMANENT FREQUENCY CHANGE AFTER SHOCK SHALL BE NO GREATER THAN PLUS OR MINUS 2 PARTS PER 10^8.

(3) ACCELERATION: WHILE OPERATING AND NON-OPERATING, PLUS OR MINUS 20G IN ANY DIRECTION FOR 5 MINUTES. PERMANENT FREQUENCY CHANGE AFTER ACCELERATION SHALL BE NO GREATER THAN 1 PART PER 10^8.

G. AGING: PLUS 1 PART PER 10^8 PER WEEK MAXIMUM AT PLUS 60 DEGREES CENTIGRADE 50 MICROWATTS CRYSTAL DRIVE.

(1) TEMPERATURE SHOCK: MINUS 40 DEGREES CENTIGRADE FOR 30 MINUTES AND PLUS 85 DEGREES CENTIGRADE FOR 30 MINUTES. TIME INTERVAL CHANGING FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 15 SECONDS. PERMANENT FREQUENCY CHANGE AFTER TEMPERATURE SHOCK SHALL BE NO GREATER THAN 1 PART 10^7.

REVISIONS 03167

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 04005	17Oct63	WK
B	REVISED PER TDRR 06010	2/4/64	EPK WK
C	REVISED PER TDRR 13665	4Nov64	WK
D	REVISED PER TDRR 21589	8/31/65	WK

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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MIT
INSTRUMENTATION LAB
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DWG. NO. CONTRACT

DRAWN Ray Whalen DATE 12 Sept 63
CHECKED J. Ruggiero / A. Marquart 12 Sept 63
APPROVAL
APPROVAL Eldon C Hall 13 Sept 63
NASA APPROVAL Jack Barnard
MIT APPROVAL L. Walsh 9/17/63

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HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 2 OF 2

MASTER

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03/67	9/17/62	DH

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-C-3098 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015401, CLASS 2.

D. PACKAGING AND PACKING: PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-C-3098, LEVEL A IN BOTH INSTANCES.

2. ACCEPTANCE AND INSPECTION: INSPECTION AND TEST PROCEDURE SHALL BE IN ACCORDANCE WITH

A. MECHANICAL REQUIREMENTS:

(1) MARKING: SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

(a) PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 BOTH INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, LOT NUMBER OR CODE, AND DATE OF MANUFACTURE.

(b) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, SERIAL NUMBER, DATE OF MANUFACTURE, NOMINAL FREQUENCY AND TURN-OVER TEMPERATURE.

(2) DIMENSIONS: IN ACCORDANCE WITH OUTLINE. 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS REQUIREMENT.

(3) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(4) LEAD TENSION: LEADS SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AS A RESULT OF THIS TEST. SAMPLE PER MIL-STD-105, LEVEL I, AQL OF 4 PERCENT.

[illegible]

(5) CRYSTAL MOUNTING: THE CRYSTAL MOUNTING SHALL BE RUGGEDIZED TO ENABLE UNIT TO MEET THE REQUIREMENTS SPECIFIED HEREIN.

(6) HEADER: GLASS, VACUUM SEALED. NO STRAIN IN HEADER SHALL BE VISIBLE WHEN INSPECTED UNDER POLARIZED LIGHT. THIS EXAMINATION SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

(7) ENVELOPE: CLEAR GLASS. NO STRAIN IN GLASS ENVELOPE SHALL BE VISIBLE WHEN INSPECTED UNDER POLARIZED LIGHT. THIS EXAMINATION SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

(8) MICROSCOPIC INSPECTION: WHEN UNITS ARE MICROSCOPICALLY INSPECTED UNDER 10X MAGNIFICATION, NO MARKINGS OR SCRATCHES IN THE CRYSTAL PLATING, OR CHIPS ON THE EDGES OF THE CRYSTAL SHALL BE VISIBLE. THIS INSPECTION SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

B. ELECTRICAL CHARACTERISTICS: THE FOLLOWING ELECTRICAL CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED. THE TEST SHALL BE PERFORMED WITH 50 MICROWATTS MAX DRIVE AND 25 PLUS OR MINUS 1 DEGREE CENTIGRADE UNLESS OTHERWISE SPECIFIED.

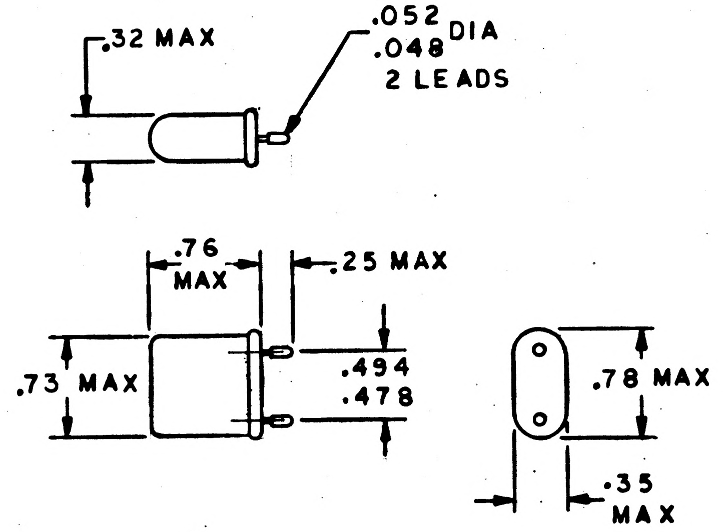
(1) FREQUENCY: 2.048000 MEGACYCLES PLUS OR MINUS .001 PERCENT, CALIBRATED IN A STANDARD 330 CI METER AT 80 MICROMICROFARADS LOAD CAPACITANCE.

(2) SERIES RESISTANCE: 30 OHMS MAXIMUM FROM ZERO DEGREES CENTIGRADE TO 85 DEGREES CENTIGRADE; 50 OHMS MAXIMUM FROM MINUS 20 DEGREES CENTIGRADE TO ZERO DEGREES CENTIGRADE.

(3) MOTIONAL CAPACITANCE: C_1 = .01296 PLUS OR MINUS 5 PERCENT.

(4) SHUNT CAPACITANCE: C_0 = 5 PICOFARADS PLUS OR MINUS 1 PICOFARAD.

(5) TEMPERATURE CHARACTERISTIC: TURN-OVER TEMPERATURE SHALL BE 65 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE. THE SLOPE ($\Delta F/\Delta T$) SHALL BE NEGATIVE FROM ZERO DEGREES CENTIGRADE TO PLUS 65 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE. THE SLOPE SHALL BE POSITIVE FROM PLUS 65 DEGREES CENTIGRADE PLUS OR MINUS 3 DEGREES CENTIGRADE TO PLUS 85 DEGREES CENTIGRADE. THE MAXIMUM FREQUENCY CHANGE SHALL BE PLUS 3 PARTS PER MILLION TO MINUS 5 PARTS PER MILLION FROM THE FREQUENCY MEASURED AT 25 DEGREES CENTIGRADE.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

—	—
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
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DWG. NO. CONTRACT
DRAWN DATE
CHECKED
APPROVAL
APPROVAL Eldon C Hall 13 Sept 62
NASA APPROVAL
MIT APPROVAL 9/17/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006847
SCALE NONE	WT	SHEET 1 OF 2

MASTE

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS 03/67

SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

2. ACCEPTANCE INSPECTION:

B. ELECTRICAL CHARACTERISTICS: CONTINUED

(6) AGING: PLUS 1 PART PER 10^8 PER WEEK MAXIMUM AT PLUS 60 DEGREES CENTIGRADE. A MINIMUM OF TWO WEEKS AGING DATA TAKEN DAILY IN THE STANDARD OSCILLATOR SHALL BE SUPPLIED WITH EACH CRYSTAL SHIPPED. 50 MICROWATTS CRYSTAL DRIVE.

(7) TEMPERATURE SHOCK: MINUS 40 DEGREES CENTIGRADE FOR 30 MINUTES AND PLUS 85 DEGREES CENTIGRADE FOR 30 MINUTES. TIME INTERVAL CHANGING FROM ONE TEMPERATURE EXTREME TO THE OTHER SHALL NOT EXCEED 15 SECONDS. PERMANENT FREQUENCY CHANGE AFTER TEMPERATURE SHOCK SHALL BE NO GREATER THAN 1 PART PER 10^7 AS MEASURED IN REQUIREMENT 2.B.(1). ALL TEMPERATURES SHALL BE HELD WITHIN PLUS OR MINUS 3 DEGREES CENTIGRADE.

3. DESIGN REQUIREMENTS:

A. SHELF LIFE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER ONE YEAR OF UNPACKAGED STORAGE UNDER THE FOLLOWING CONDITIONS: RELATIVE HUMIDITY UP TO 95 PERCENT, TEMPERATURES AS LOW AS MINUS 18 DEGREES CENTIGRADE OR AS HIGH AS PLUS 52 DEGREES CENTIGRADE, AND AT ALTITUDES AS HIGH AS 10,000 FEET. IT SHALL BE ASSUMED THAT THE UNITS WILL BE EXPOSED TO AMBIENT ATMOSPHERE DURING THE ONE YEAR PERIOD.

B. PACKAGED STORAGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE REQUIREMENTS SPECIFIED HEREIN AFTER 3 YEARS OF DEAD STORAGE WHEN PACKAGED FOR OVERSEAS SHIPMENT IN ACCORDANCE WITH SPECIFICATION JAN-P-100-1. ENVIRONMENTAL CONDITIONS FOR PACKAGED STORAGE SHALL BE AS INDICATED FOR ALL NON-OPERATING CONDITIONS SPECIFIED ABOVE EXCEPT THE STORAGE TEMPERATURE MAY BE AS HIGH AS PLUS 71 DEGREES CENTIGRADE OR AS LOW AS MINUS 40 DEGREES CENTIGRADE, THERE MAY BE VIBRATORY ACCELERATION FOR PERIODS OF 25 HOURS OF 1.0G FROM 2 TO 30 CYCLES PER SECOND AND THERE MAY BE OCCASIONAL SHOCKS UP TO 10G.

C. SPURIOUS MODES: ALL SPURIOUS MODES SHALL BE AT LEAST 3.5 DECIBELS DOWN FOR PLUS OR MINUS 100 KILOCYCLES FROM THE DRIVE LEVEL AT 2.048 MEGACYCLES OVER THE TEMPERATURE RANGE FROM ZERO DEGREES CENTIGRADE TO PLUS 85 DEGREES CENTIGRADE.

D. CRYSTAL ELEMENT: QUARTZ, "AT" CUT, GOLD OR ALUMINUM PLATED. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

E. ENVIRONMENTAL REQUIREMENTS: UNITS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING ENVIRONMENTAL TESTS. MECHANICAL TESTS (VIBRATION, SHOCK AND ACCELERATION) SHALL BE CONDUCTED WITH THE UNIT MOUNTED BY MEANS OF AN APPROPRIATE FIXTURE WITH THE BODY RESTRAINED FROM MOVEMENT.

(1) VIBRATION: WHILE OPERATING FROM 15 TO 31 CYCLES PER SECOND AT 0.2 INCH DOUBLE AMPLITUDE; FROM 31 TO 2,000 CYCLES PER SECOND AT PLUS OR MINUS 10G. FREQUENCY CHANGE DURING VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^7. A RESONANCE SEARCH SHALL BE MADE THROUGHOUT THE FREQUENCY RANGE SPECIFIED AND A 15 MINUTE FATIGUE VIBRATION TEST SHALL BE PERFORMED AT EACH MAJOR RESONANCE. PERMANENT FREQUENCY CHANGE AFTER VIBRATION SHALL BE NO GREATER THAN PLUS OR MINUS ONE (1) PART PER 10^8.

(2) MECHANICAL SHOCK: WHILE OPERATING, 50G FOR 11 MILLISECONDS PLUS OR MINUS ONE (1) MILLISECOND DURATION SIMILAR TO THAT OBTAINED WITH A BARRY TYPE SHOCK MACHINE PER MIL-S-4456. 3 SHOCKS IN EACH OF THE 3 MUTUALLY PERPENDICULAR PLANES FOR A TOTAL OF 18 SHOCKS. PERMANENT FREQUENCY CHANGE AFTER SHOCK SHALL BE NO GREATER THAN PLUS OR MINUS 2 PARTS PER 10^8.

(3) ACCELERATION: WHILE OPERATING AND NON-OPERATING, PLUS OR MINUS 20G IN ANY DIRECTION FOR 5 MINUTES. PERMANENT FREQUENCY CHANGE AFTER ACCELERATION SHALL BE NO GREATER THAN 1 PART PER 10^8.

F. PARALLEL RESISTANCE: 40 OHMS MAXIMUM FROM ZERO DEGREES CENTIGRADE TO 85 DEGREES CENTIGRADE, 80 OHMS MAXIMUM FROM MINUS 20 DEGREES CENTIGRADE TO ZERO DEGREES CENTIGRADE, AT 80 MICROMICROFARADS LOAD CAPACITANCE.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 12 Sept 63
CHECKED 12 Sept 63
APPROVAL
APPROVAL Elden C Hall 13 Sept 63
NASA APPROVAL
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CRYSTAL UNIT, QUARTZ

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006847
SCALE NONE
WT
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006849 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02388		9/17/63

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

D. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, LOT OR SERIAL NUMBER AND EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. DIMENSIONS: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A GLASS CLOTH-BASED SINGLE COATED, THERMOSETTING, ADHESIVE WITH A SINGLE LINER.

B. TEMPERATURE RANGE: -55° TO +150°C.

C. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.

D. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F THE TAPE SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.

E. CHARACTERISTICS: (IN ACCORDANCE WITH TESTS OF AMERICAN SOCIETY FOR TESTING MATERIALS D-1000)

(1) THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ± .0005.

(2) TENSILE STRENGTH: 100 PSI, MINIMUM.

(3) ELECTRIC STRENGTH: 5500 VOLTS, MINIMUM.

(4) INSULATION RESISTANCE: 3000 MEGOHMS, MINIMUM.

(5) ELONGATION: 5.0 PERCENT, MAXIMUM.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01769 DATE 26 June 63

TABLE I

DASH NO.	DIMENSIONS	
	WIDTH	LENGTH PER ROLL
-1	1.500 ± .005	60 YDS
-2	0.600 ± .005	60 YDS
-3	0.290 ± .010	60 YDS
-4	0.800 ± .005	60 YDS
-5	1.400 ± .005	60 YDS
-6	1.650 ± .010	60 YDS
-7	0.250 ± .005	60 YDS
-8	0.400 ± .010	60 YDS
-9	0.340 ± .010	60 YDS
-10	1.000 ± .010	60 YDS
-11	0.700 ± .005	60 YDS
-12	.900 ± .010	60 YDS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 13 June 63
CHECKED J. Ruggeri 14 JUNE 63
APPROVAL
APPROVAL Ellen C Hall 25 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE, SINGLE COATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006849
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006849 B

	REVISIONS TDRR 01769 26 June 63		
SYM	**DESCRIPTION**	**DATE**	**APPROVAL**
Ⓜ —			
Ⓜ A	REVISED PER TDRR 02388		3/7/63
B	UPGRADED TO CLASS A WITHOUT CHANGES PER TDRR 02969	9/5/63	

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

D. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, LOT OR SERIAL NUMBER AND EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. DIMENSIONS: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A GLASS CLOTH-BASED SINGLE COATED, THERMOSETTING, ADHESIVE WITH A SINGLE LINER.

B. TEMPERATURE RANGE: -55° TO +150°C.

C. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.

D. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F THE TAPE SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.

E. CHARACTERISTICS: (IN ACCORDANCE WITH TESTS OF AMERICAN SOCIETY FOR TESTING MATERIALS D-1000)
(1) THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ± .0005.
(2) TENSILE STRENGTH: 100 PSI, MINIMUM.
(3) ELECTRIC STRENGTH: 5500 VOLTS, MINIMUM.
(4) INSULATION RESISTANCE: 3000 MEGOHMS, MINIMUM.
(5) ELONGATION: 5.0 PERCENT, MAXIMUM.

TABLE I

DASH NO.	DIMENSIONS	
	WIDTH	LENGTH PER ROLL
-1	1.500 ± .005	60 YDS
-2	0.600 ± .005	60 YDS
-3	0.290 ± .010	60 YDS
-4	0.800 ± .005	60 YDS
-5	1.400 ± .005	60 YDS
-6	1.650 ± .010	60 YDS
-7	0.250 ± .005	60 YDS
-8	0.400 ± .010	60 YDS
-9	0.340 ± .010	60 YDS
-10	1.000 ± .010	60 YDS
-11	0.700 ± .005	60 YDS
-12	.900 ± .010	60 YDS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J.D. Gay Wheeler DATE 13 June 63
CHECKED J. Ruggeri / H. Maynard 14 JUNE 63
APPROVAL
APPROVAL Ellen C Hall 25 June 63
NASA APPROVAL Jack Barnard
MIT APPROVAL W Kupfer 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE, SINGLE COATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006849
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS TDRR 01769 26 June 63			
SYM	DESCRIPTION	DATE	APPROVAL
Ⓜ —			
Ⓜ A	REVISED PER TDRR 02388		9/17/63
Ⓜ B	UPGRADED TO CLASS A WITHOUT CHANGES PER TDRR 02969	9/5/62	
C	REVISED PER TDRR 03514	30Oct63	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

D. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, LOT OR SERIAL NUMBER AND EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. DIMENSIONS: PER TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A GLASS CLOTH-BASED SINGLE COATED, THERMOSETTING, ADHESIVE WITH A SINGLE LINER OR DOUBLR COATED, THERMOSETTING, ADHESIVE WITH A DOUBLE LINER AS NOTED PER TABLE I

B. TEMPERATURE RANGE: -55° TO +150°C.

C. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.

D. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F THE TAPE SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.

E. CHARACTERISTICS: (IN ACCORDANCE WITH TESTS OF AMERICAN SOCIETY FOR TESTING MATERIALS D-1000)

(1) THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ± .0005 FOR SINGLE COATED, 0.006 ± 0.0005 FOR DOUBLE COATED

(2) TENSILE STRENGTH: 100 PSI, MINIMUM.

(3) ELECTRIC STRENGTH: 5500 VOLTS, MINIMUM.

(4) INSULATION RESISTANCE: 3000 MEGOHMS, MINIMUM.

(5) ELONGATION: 5.0 PERCENT, MAXIMUM.

TABLE I

ADHESIVE ONE SIDE DASH NO.	DIMENSIONS		ADHESIVE BOTH SIDES DASH NO.
	WIDTH	LENGTH PER ROLL	
-1	1.500 ± .005	60 YDS	
-2	0.600 ± .005	60 YDS	
-3	0.290 ± .010	60 YDS	
-4	0.800 ± .005	60 YDS	-15
-5	1.400 ± .005	60 YDS	-16
-6	1.650 ± .010	60 YDS	
-7	0.250 ± .005	60 YDS	
-8	0.400 ± .010	60 YDS	
-9	0.340 ± .010	60 YDS	
-10	1.000 ± .010	60 YDS	
-11	0.700 ± .005	60 YDS	-17
-12	.900 ± .010	60 YDS	
-14	.500 ± .010	60 YDS	-13

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
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APPLICATION	

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 13 June 63
CHECKED J. Ruggen / H. 14 June 63
APPROVAL
APPROVAL Ellen C Hall 25 June 63
NASA APPROVAL Jack Berman
MIT APPROVAL 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006849
SCALE NONE	WT	SHEET 1 OF 1

1006849 E

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS TDRR 01769 26 June 63		
—			
A	REVISED PER TDRR 02388		9/7/63
B	UPGRADED TO CLASS A WITHOUT CHANGES PER TDRR 02969	9/5/63	
C	REVISED PER TDRR 03514	30 Oct 63	WK
D	REVISED PER TDRR 10116	6/16/64	
E	REVISD PER TDRR 10173	6/16/64	

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REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

D. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, LOT OR SERIAL NUMBER AND EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.

2. ACCEPTANCE AND INSPECTION:

A. DIMENSIONS: PER TABLE I.
B. MARKING: PER PARAGRAPH 1.
C. THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ± .0005 FOR SINGLE COATED, 0.006 ± 0.0005 FOR DOUBLE COATED.

3. DESIGN:

A. TAPE SHALL BE A GLASS CLOTH-BASED SINGLE COATED, THERMOSETTING, ADHESIVE WITH A SINGLE LINER OR DOUBLR COATED, THERMOSETTING, ADHESIVE WITH A DOUBLE LINER AS NOTED PER TABLE I

B. TEMPERATURE RANGE: -55° TO +150°C.

C. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.

D. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F THE TAPE SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.

E. CHARACTERISTICS: (IN ACCORDANCE WITH TESTS OF AMERICAN SOCIETY FOR TESTING MATERIALS D-1000)

(1) TENSILE STRENGTH: 100 PSI, MINIMUM.
(2) ELECTRIC STRENGTH: 5500 VOLTS, MINIMUM.
(3) INSULATION RESISTANCE: 3000 MEGOHMS, MINIMUM.
(4) ELONGATION: 5.0 PERCENT, MAXIMUM.

F. CURING REQUIREMENTS; RECOMMENDED, 3 HOURS AT 250°F OR 2 HOURS AT 275°F OR 1 HOUR AT 300°F.

TABLE I

ADHESIVE ONE SIDE DASH NO.	DIMENSIONS		ADHESIVE BOTH SIDES DASH NO.
	WIDTH	LENGTH PER ROLL	
-1	1.500 ± .005	60 YDS	
-2	0.600 ± .005	60 YDS	
-3	0.290 ± .010	60 YDS	
-4	0.800 ± .005	60 YDS	-15
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-6	1.650 ± .010	60 YDS	
-7	0.250 ± .005	60 YDS	
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-9	0.340 ± .010	60 YDS	
-10	1.000 ± .010	60 YDS	
-11	0.700 ± .005	60 YDS	-17
-12	.900 ± .010	60 YDS	
-14	.500 ± .010	60 YDS	-13
-18	.150 ± .010	60 YDS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 13 June 63
CHECKED 14 June 63
APPROVAL
APPROVAL Ellen C Hall 25 June 63
NASA APPROVAL
MIT APPROVAL 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006849
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1006849 F

REVISIONS TDRR 01769 26 June 63

SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02388		9/17/63
B	UPGRADED TO CLASS A WITHOUT CHANGES PER TDRR 02969	9/5/63	
C	REVISED PER TDRR 03514	30 Oct 63	WK
D	REVISED PER TDRR 10116	6/16/64	
E	REVISD PER TDRR 10173	6/16/64	
F	REVISED PER TDRR 17364	18 Nov 66	WK

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

D. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, LOT OR SERIAL NUMBER AND EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.

2. ACCEPTANCE AND INSPECTION:

A. DIMENSIONS: PER TABLE I.
B. MARKING: PER PARAGRAPH 1.
C. THICKNESS,WITH ADHESIVE, LESS LINER: 0.004 ± .0005 FOR SINGLE COATED, 0.006 ± 0.0005 FOR DOUBLE COATED.

3. DESIGN:

A. TAPE SHALL BE A GLASS CLOTH-BASED SINGLE COATED, THERMOSETTING, ADHESIVE WITH A SINGLE LINER OR DOUBLR COATED, THERMOSETTING, ADHESIVE WITH A DOUBLE LINER AS NOTED PER TABLE I

B. TEMPERATURE RANGE: -55° TO +150°C.

C. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.

D. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F THE TAPE SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.

E. CHARACTERISTICS: (IN ACCORDANCE WITH TESTS OF AMERICAN SOCIETY FOR TESTING MATERIALS D-1000)

(1) TENSILE STRENGTH: 100 PSI, MINIMUM.
(2) ELECTRIC STRENGTH: 5500 VOLTS, MINIMUM.
(3) INSULATION RESISTANCE: 3000 MEGOHMS, MINIMUM.
(4) ELONGATION: 5.0 PERCENT, MAXIMUM.

F. CURING REQUIREMENTS; RECOMMENDED, 3 HOURS AT 250°F OR 2 HOURS AT 275°F OR 1 HOUR AT 300°F.

TABLE I

ADHESIVE ONE SIDE DASH NO.	DIMENSIONS		ADHESIVE BOTH SIDES DASH NO.
	WIDTH	LENGTH PER ROLL	
-1	1.500 ± .005	60 YDS	
-2	0.600 ± .005	60 YDS	
-3	0.290 ± .010	60 YDS	
-4	0.800 ± .005	60 YDS	-15
-5	1.400 ± .005	60 YDS	-16
-6	1.650 ± .010	60 YDS	
-7	0.250 ± .005	60 YDS	
-8	0.400 ± .010	60 YDS	
-9	0.340 ± .010	60 YDS	
-10	1.000 ± .010	60 YDS	
-11	0.700 ± .005	60 YDS	-17
-12	.900 ± .010	60 YDS	
-14	.500 ± .010	60 YDS	-13
-18	.150 ± .010	60 YDS	
-19	.200 ± .005	60 YDS	—

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 13 June 63
CHECKED J. Ruggeri / H. Maynard 14 JUNE 63
APPROVAL
APPROVAL Ellm C Hall 25 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006849
SCALE NONE
WT
SHEET 1 OF 1

1006849

SYM	DESCRIPTION	DATE	APPROVAL
—			

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

C. PACKAGING: TAPE SHALL BE PACKAGED IN SUCH FASHION AS TO PREVENT ANY DEFORMITY IN SHAPE OR CONTOUR OF THE ROLLS DURING SHIPMENT.

D. MARKING: UNIT PACKAGES, INTERMEDIATE PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE NUMBER, WIDTH, LOT OR SERIAL NUMBER AND EXPIRATION DATE AS WELL AS THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. DIMENSIONS: PER TABLE I. TABLE I.

B. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

A. TAPE SHALL BE A GLASS CLOTH-BASED SINGLE COATED, THERMOSETTING, ADHESIVE WITH A SINGLE LINER.

B. TEMPERATURE RANGE: -55° TO +150°C.

C. LINER: SHALL BE SILICONE TREATED CREPE PAPER 0.005 ± .002 THICK.

D. SHELF LIFE: WHEN STORED AT A TEMPERATURE OF 70°F THE TAPE SHALL HAVE A SHELF LIFE OF NOT LESS THAN 12 MONTHS.

E. CHARACTERISTICS: (IN ACCORDANCE WITH TESTS OF AMERICAN SOCIETY FOR TESTING MATERIALS D-1000)

(1) THICKNESS, WITH ADHESIVE, LESS LINER: 0.004 ±.0005.

(2) TENSILE STRENGTH: 100 PSI, MINIMUM.

(3) ELECTRIC STRENGTH: 5500 VOLTS, MINIMUM.

(4) INSULATION RESISTANCE: 3000 MEGOHMS, MINIMUM.

(5) ELONGATION: 5.0 PERCENT, MAXIMUM.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01769 DATE 26 Jun 63

TABLE I

DASH NO.	DIMENSIONS	
	WIDTH	LENGTH PER ROLL
-1	1.500 ± .005	60 YDS
-2	0.600 ± .005	60 YDS
-3	0.290 ± .010	60 YDS
-4	0.800 ± .005	60 YDS
-5	1.400 ± .005	60 YDS
-6	1.650 ± .010	60 YDS
-7	0.250 ± .005	60 YDS
-8	0.400 ± .010	60 YDS
-9	0.340 ± .010	60 YDS
-10	1.000 ± .010	60 YDS
-11	0.700 ± .005	60 YDS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J. W. Gay Wheeler DATE 13 June 63
CHECKED J. Ruggeri / H. Maynard 14 JUNE 63
APPROVAL
APPROVAL Eldon C Hall 25 June 63
NASA APPROVAL Jack Barnes
MIT APPROVAL W Cooper 26 June 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATION TAPE, ELECTRICAL
THERMOSETTING ADHESIVE, SINGLE COATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.	
	C	1006849	
SCALE NONE	WT		SHEET 1 OF 1

1006849

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

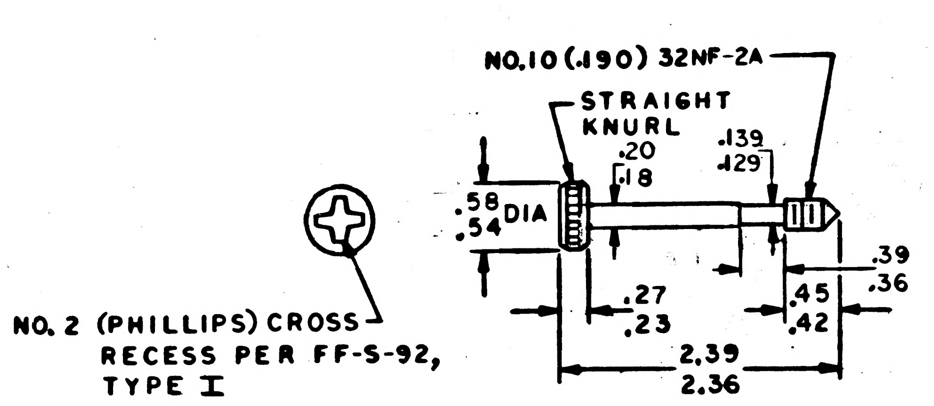
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 02528	14 Aug 63	WK
A	CHANGED ~~PER TDRR~~ 10087 DR K Fenchetti CHK APPD A. Maynard	20 Jun 64	JB

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 3.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER PLUS REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) MATERIAL: CORROSION-RESISTING STEEL PER MIL-S-7720, COMPOSITION FMS. MATERIAL CERTIFICATION MUST ACCOMPANY EACH SHIPMENT.
     - (2) FINISH: PASSIVATED PER MIL-F-14072, E300.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02528 DATE 14 Aug 63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN M.S. C. Crawford DATE 29 Jul 63
CHECKED J. Buggin H. Meyer
APPROVAL C Sparling 8/2/63
APPROVAL 8/2/63
APPROVAL T Naughton 8/2/63
NASA APPROVAL Jack Barnes
MIT APPROVAL C Gedeman 8/14/63
MIT APPROVAL 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

THUMBSCREW,
CROSS RECESSED, CAPTIVE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006850
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006850

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 02528	14 Aug	WK

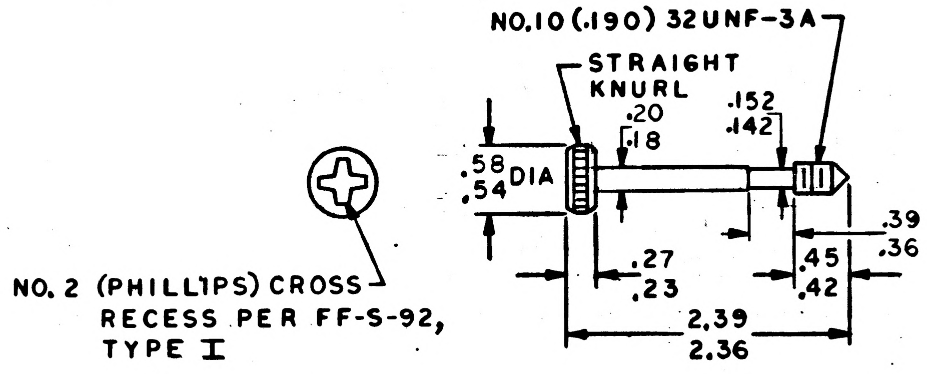
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
    - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 3.
    - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER PLUS REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
    - A. MECHANICAL PROPERTIES:
        - (1) MATERIAL: CORROSION-RESISTING STEEL PER MIL-S-7720, COMPOSITION FMS. MATERIAL CERTIFICATION MUST ACCOMPANY EACH SHIPMENT.
        - (2) FINISH: PASSIVATED PER MIL-F-14072, E300.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02528 DATE 14 Aug 63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 29 July 63
CHECKED
APPROVAL 8/2/63
APPROVAL 8/2/63
APPROVAL 8/2/63
NASA APPROVAL
MIT APPROVAL 8/9/63
MIT APPROVAL 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

THUMBSCREW, CROSS RECESSED, CAPTIVE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006850
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	REVISED PER TDRR 06321 DR C. La Porte CHK A. Caggiano APPD H. Maynard	3/10/64	WL

REQUIREMENTS:

1. GENERAL:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   B. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY OF PARTS ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

      (1) DIMENSIONS: SEE SKETCH.

3. DESIGN:

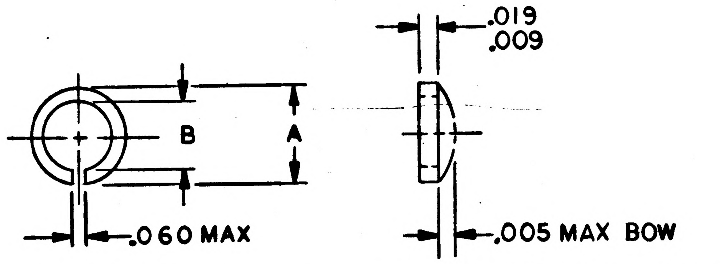
   A. MATERIAL: CORROSION-RESISTANT STEEL PER MIL-S-5059, TYPE 302.

   B. FINISH: PASSIVATED PER MIL-F-14072, E300.

   C. CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL ACCOMPANY EACH SHIPMENT.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02692 DATE 8/21/63

DASH NO.	DIA "A"	DIA "B"
-1	.291 .281	.151 .161
-2	.365 .355	.151 .161



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J. D. R. Wheeler DATE 30 July 63
CHECKED J. Ruggeri / H. Maynard 31 July 63
APPROVAL C. Gerling RRK
APPROVAL 8/13/63
APPROVAL 8/14/63
NASA APPROVAL 8/21/63
MIT APPROVAL Gelman 8/20/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WASHER, RETAINING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006851
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY OF PARTS ENCLOSED.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: SEE SKETCH.

3. DESIGN:

A. MATERIAL: CORROSION-RESISTANT STEEL PER MIL-S-5059, TYPE 302.

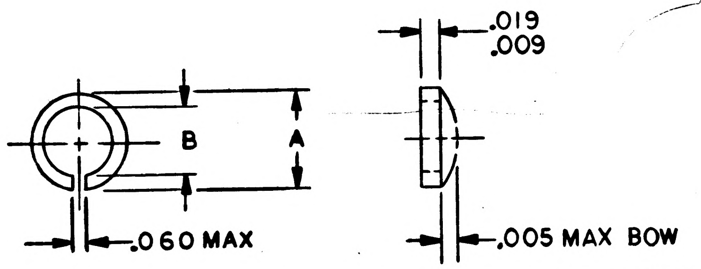
B. FINISH: PASSIVATED PER MIL-F-14072, E300.

C. CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL ACCOMPANY EACH SHIPMENT.

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 02692 DATE 8/21/63

DASH NO.	DIA "A"	DIA "B"
-1	.291 .281	.151 .161
-2	.350 .340	.151 .161



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 30 July 63
CHECKED 31 July 63
APPROVAL
APPROVAL 8/13/63
APPROVAL 8/14/63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/20/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WASHER, RETAINING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006851
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006851

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	REVISED PER TDRR 06322 DR Ken Budd CHK A. Caggiano APPD H. Haynard	3/10/64	WH

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

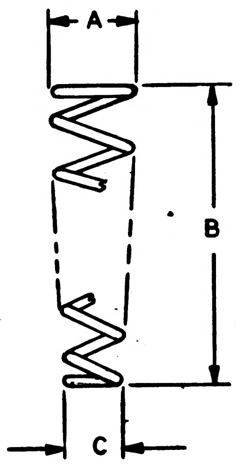
NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 3.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER PLUS REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) MATERIAL: CORROSION-RESISTING STEEL PER QQ-W-423, COMPOSITION FS302, COND B (SPRING TEMPER).
     - (2) FINISH: PASSIVATED PER MIL-F-14072, E300.
     - (3) FINISH AND MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.
     - (4) DIMENSIONS:

A	C	B FREE	B COMPRESS	WIRE DIA	TOTAL NO. COILS	END FINISH
.340 .330	.230 .220	1-1/4 APPROX.	.118 MAX	.015 .017	6-1/2	CLOSED SQUARE NOT GROUND

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02692 DATE 8/21/63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DMS C. Camp DATE 24 Jul 63
CHECKED J. Caggiano H. Haynard 20 Aug 63
APPROVAL C. Sparling
APPROVAL 8/2/63
APPROVAL L. E. Spittone 8/14/63
NASA APPROVAL 8/21/63
MIT APPROVAL L. Jedman 8/20/63
MIT APPROVAL L. Hazel 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SPRING, HELICAL, COMPRESSION

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006852
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

NOTES:

1. GENERAL REQUIREMENTS:

   A. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 3.

   B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER (DRAWING NUMBER PLUS REVISION LETTER).

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:

   A. MECHANICAL PROPERTIES:

      (1) MATERIAL: CORROSION-RESISTING STEEL PER QQ-W-423, COMPOSITION FS302, COND B (SPRING TEMPER).

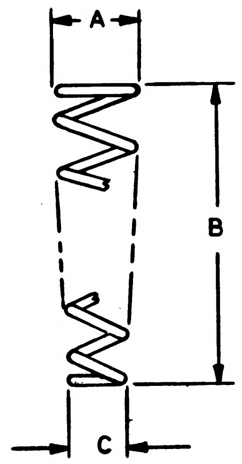
      (2) FINISH: PASSIVATED PER MIL-F-14072, E300

      (3) FINISH AND MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.

      (4) DIMENSIONS:

A	C	B FREE	B COMPRESS	WIRE DIA	TOTAL NO. COILS	END FINISH
.365 .355	.230 .220	1-1/4 APPROX.	.118 MAX	.015 .017	6-1/2	CLOSED SQUARE NOT GROUND

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02692 8/21/63 DATE



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DMS DATE 29 July 63
CHECKED
APPROVAL
APPROVAL 8/2/63
APPROVAL 8/1/63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/20/63
MIT APPROVAL 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SPRING, HELICAL, COMPRESSION

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006852
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03/69	9/17/6	

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03169 DATE 9/17/63

REQUIREMENTS:

1. GENERAL:

A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER. MANUFACTURER'S NAMEPLATE SHALL BE MOUNTED ON REAR OF UNIT. ALL FRONT PANEL MARKING FOR CONTROLS AND INDICATORS SHALL BE SILK-SCREENED .12 HIGH BLACK CHARACTERS AND .03 WIDE LINES PER ND 1002019 UNLESS OTHERWISE SPECIFIED ON DRAWING. PACKAGING SHALL BE IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

(1) DIMENSIONS: PER SKETCH.

(2) CONTROLS: THE FOLLOWING CONTROLS AND INDICATORS MUST BE AVAILABLE ON THE FRONT PANEL:

REFRIGERATION OR HEAT CONTROL	
COOLANT PUMP	ON-OFF CONTROL
COOLANT TEMPERATURE	CONTROL AND INDICATOR (1)
COOLANT FLOW RATE	CONTROLS AND INDICATORS (2)

(3) FRONT PANEL HARDWARE SHALL BE CROSS RECESSED TYPE PER MS 35216 WHERE POSSIBLE.

(4) ALL CONTROL KNOBS SHALL BE PER MS 91528A WHERE POSSIBLE.

B. ELECTRICAL CHARACTERISTICS:

(1) OPERATING CURRENT: 13.5 AMPERES.

(2) STARTING CURRENT: 35 AMPERES MAXIMUM.

(3) INPUT: 115 VOLTS, 1 PHASE, 60 CYCLES PER SECOND.

(4) POWER INPUT CONNECTOR SHALL BE MS 3120E-14-5P. THE HIGH SIDE OF THE LINE SHALL HAVE PARALLEL CONNECTIONS TO PINS B & C. THE LOW SIDE OF THE LINE SHALL HAVE PARALLEL CONNECTIONS TO PINS D AND E. PIN A SHALL BE CHASSIS GROUND.

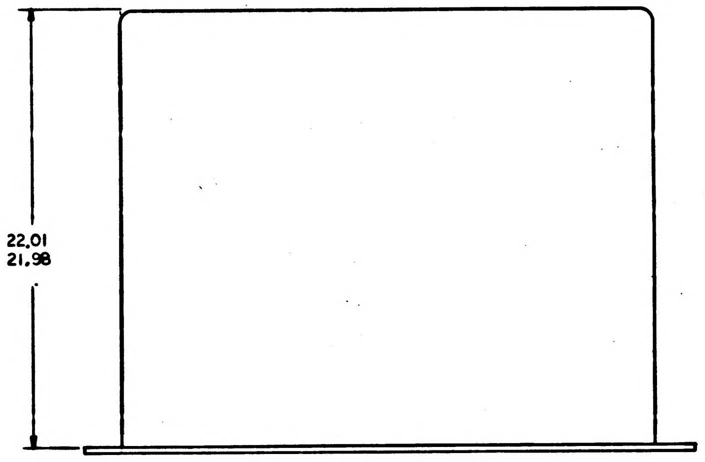
3. DESIGN:

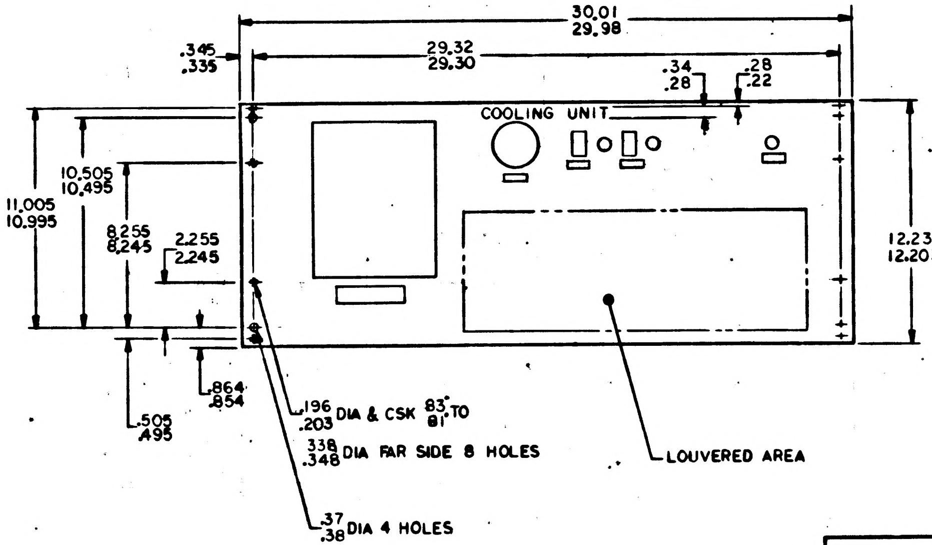
A. CONSTRUCTION: PANEL MATERIAL SHALL BE .185/.195 THICK 6061-T-6 ALUMINUM PER QQ-A-327.

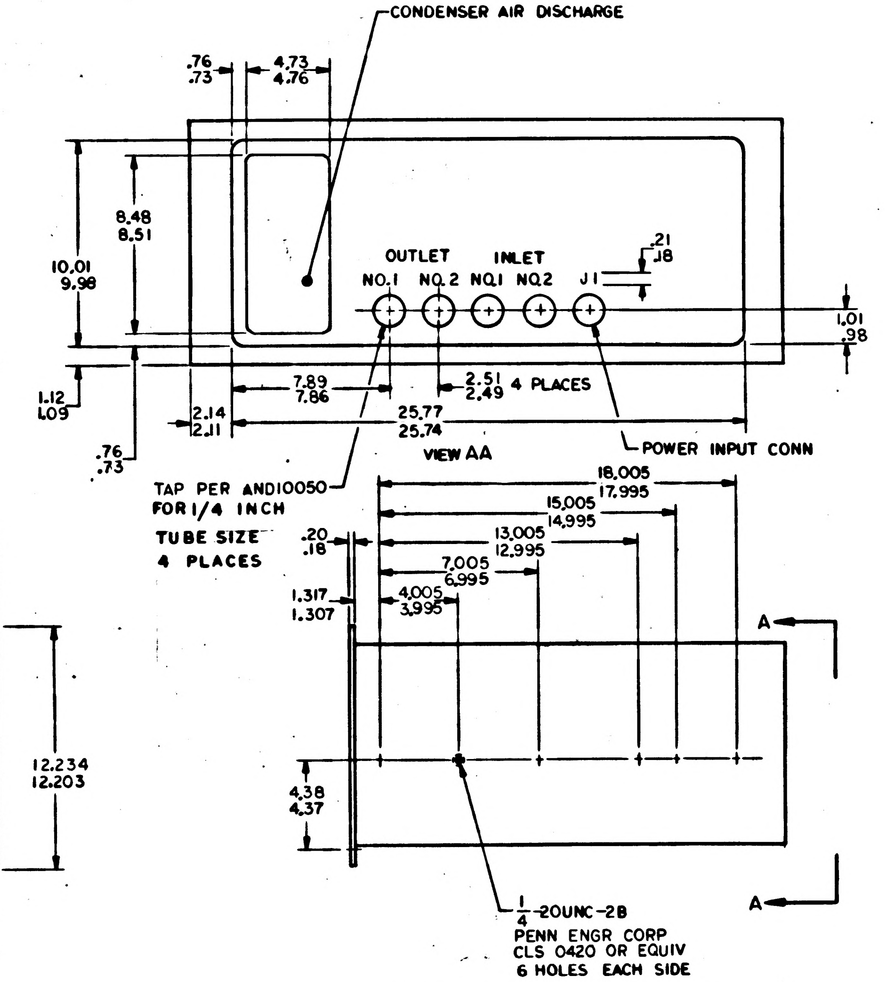
B. FINISH: FRONT AND EDGE PANEL FINISH SHALL BE ONE (1) COAT PAINT TT-E-529, LIGHT GRAY CLASS B SEMIGLOSS ENAMEL, COLOR NUMBER 26440 OF FED-STD-595, IN ACCORDANCE WITH MIL-F-14072, P513 TYPE I EXCEPT THAT MIL-C-5541 CHROMATE FILM SHALL BE ELECTRICALLY CONDUCTIVE.

C. SHALL OPERATE USING A LIQUID COOLANT OF THE FOLLOWING COMPOSITION:

PARTS BY WEIGHT	COMPONENT
62.500	ETHYLENE GLYCOL PER MIL-E-9500
37.422	TRIPLE DISTILLED WATER
1.563	TRIETHANOLAMINEPHOSPHATE
.156	SODIUMMERCAPTOBENZOTHIOZOL




30.01
29.98
29.32
29.30
.345
.335
.34
.28
.28
.22
COOLING UNIT
10.505
10.495
11.005
10.995
8.255
8.245
2.255
2.245
12.234
12.203
.864
.854
.505
.495
.196
.203 DIA & CSK 83° TO 81°
.338
.348 DIA FAR SIDE 8 HOLES
LOUVERED AREA
.37
.38 DIA 4 HOLES


CONDENSER AIR DISCHARGE
.76
.73
4.73
4.76
8.48
8.51
10.01
9.98
OUTLET
INLET
NO.1
NO.2
NO.1
NO.2
J1
.21
.18
1.01
.98
1.12
1.09
7.89
7.86
2.51
2.49 4 PLACES
2.14
2.11
25.77
25.74
.76
.73
VIEW AA
POWER INPUT CONN
TAP PER AND10050 FOR 1/4 INCH TUBE SIZE 4 PLACES
18.005
17.995
15.005
14.995
13.005
12.995
7.005
6.995
4.005
3.995
.20
.18
1.317
1.307
A
A
4.38
4.37
1/4-20UNC-2B
PENN ENGR CORP
CLS 0420 OR EQUIV
6 HOLES EACH SIDE

ORIGINAL SOURCE OF SUPPLY:

BUDD ELECTRONICS
LONG ISLAND 1, NEW YORK
CODE IDENT NO. 02749
MODEL NO: CRG-3045 (AS MODIFIED HEREIN)
MANUFACTURER'S DATA SHEET 2C-215
DRAWING P-9459-RB-1

SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Russell DATE 27 JUNE 63
CHECKED J. Ryan 27 June 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL J. Nofal 9/10/63
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COOLING UNIT,
PANEL TYPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006853
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS 03169			
SYM	DESCRIPTION	DATE	APPROVED

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(CONTINUED)

3. D. ENVIRONMENT AND SINK: AMBIENT AIR SHALL BE USED AS THE ULTIMATE SINK FOR HEAT REJECTION. THE AMBIENT CONDITIONS WILL BE AS FOLLOWS:

TEMPERATURE: 50°F MIN.
100°F MAX.

PRESSURE/ALTITUDE: 24.00 IN. Hg MIN.
32.00 IN. Hg MAX.

HUMIDITY: 100 PERCENT RELATIVE HUMIDITY MAX.

E. LIQUID COOLANT EQUIPMENT MATERIAL: THE MATERIALS USED IN THE COOLANT LOOP OF THE EQUIPMENT MUST BE THOSE THAT WILL MINIMIZE CORROSION WITHIN THE OVERALL SYSTEM WHICH WILL INCLUDE ALUMINUM COLD PLATES. COPPER OR COPPER BASE ALLOYS SHALL NOT BE USED.

F. LIQUID COOLANT RESERVOIR: THE LIQUID COOLANT RESERVOIR AND/OR EXPANSION TANK SHALL BE OF A NON-BREATHING DESIGN UTILIZING A RUBBER BLADDER, METAL BELLOWS, OR A TRAPPED VOLUME OF GAS TO TAKE CARE OF THE LIQUID THERMAL EXPANSION.

G. LIQUID COOLANT FILTER: THE EQUIPMENT SHALL INCLUDE A FULL FLOW FILTER WITH A NOMINAL RATING OF NOT MORE THAN 10 MICRON. THE FILTER MAY BE OF THE DISPOSABLE CARTRIDGE VARIETY.

H. COOLANT TEMPERATURE, FLOW RATE AND HEAT REMOVAL. TO PROVIDE PROPER EVALUATION OF THE ELECTRONIC EQUIPMENT UNDER TEST, THE COOLANT FLOW RATE AND INLET TEMPERATURE TO THE COLD PLATES MUST BE CONTROLLABLE OVER THE FOLLOWING RANGES:

	SET POINT RANGE	CONTROL ACCURACY
TEMPERATURE	45-105°F	± 3°F
FLOW RATE - EACH LINE	25-80PPH	± 2PPH

THE PRESSURE DROPS AND HEAT PICK-UP EXTERNAL TO THE COOLING EQUIPMENT WILL BE:

PRESSURE DROP: 10 PSI MAX

HEAT: 0-250 WATTS MAX

I. HEATING AND COOLING: HEATING OF THE COOLANT SHALL BE BY ELECTRIC RESISTANCE IMMERSION HEATERS. COOLING SHALL BE BY MECHANICAL REFRIGERATION.

J. INSTRUCTION AND MAINTENANCE MANUALS; A QUANTITY OF 2 SHALL BE SUPPLIED WITH EACH UNIT.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03169 DATE 9/17/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE Aug 63
CHECKED
APPROVAL
APPROVAL 8/21/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 9/17/63
MIT APPROVAL 9/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COOLING UNIT,
PANEL TYPE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006853
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006853

INCHES
0 1 2
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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03142	9/12/63	

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, LOT CODE, DATE OF MANUFACTURE AND NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) CERTIFICATION: MATERIAL AND FINISH REQUIREMENTS SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION:
     - (1) MATERIAL: ALUMINUM ALLOY SLIDE MEMBERS PER QQ-A-261 (2014-T6). COMPONENT PARTS ARE 302 OR 303 CORROSION RESISTING STEEL AND BALLS ARE 440 CORROSION RESISTING STEEL PER MIL-S-7720.
     - (2) FINISH: ALUMINUM PARTS ARE CLEAR ANODIZED PER MIL-A-8625A, TYPE II. STEEL PARTS ARE PASSIVATED PER MIL-S-5002.
   - B. SLIDE ACTION: SLIDES SHALL OPEN TO THE EXTENSION SHOWN AND LOCK IN THE OPEN POSITION. THEY SHALL CLOSE ALL THE WAY BY DEPRESSING THE OPEN POSITION LOCK AND TELESCOPING.
   - C. LOAD CAPACITY: EACH SLIDE SHALL BE CAPABLE OF SUPPORTING 100 POUNDS FROM THE END WHEN FULLY EXTENDED IN THE HORIZONTAL POSITION.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03142 DATE 12 Sep 63

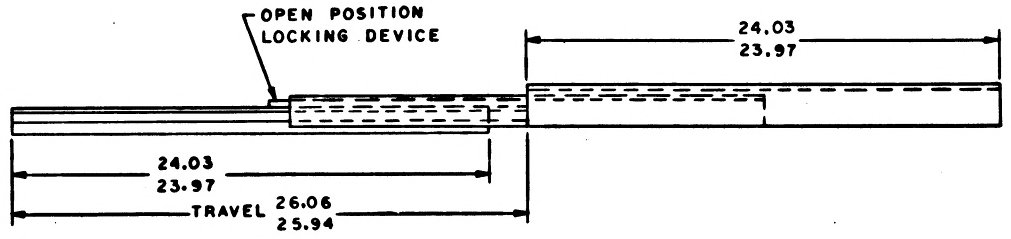
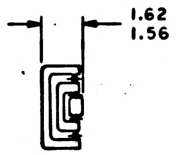
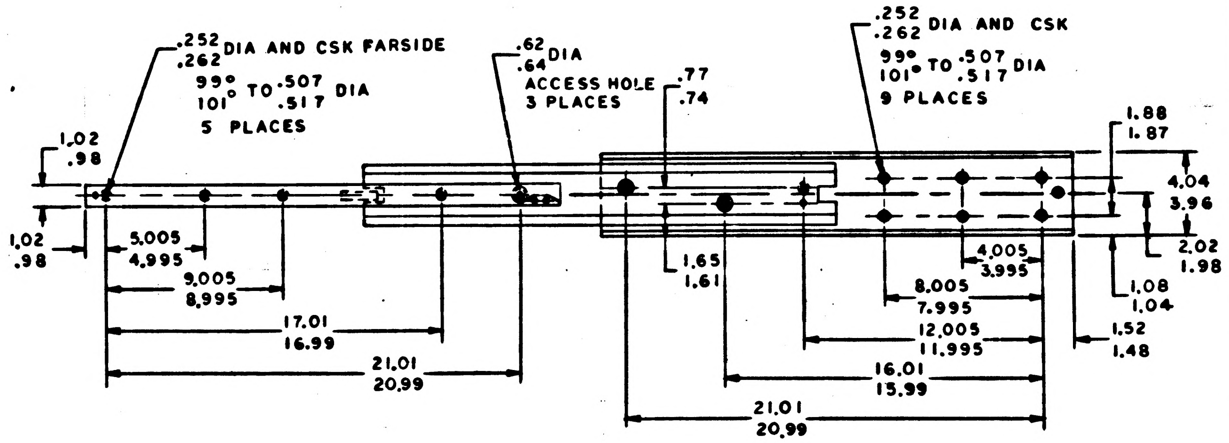

OPEN POSITION LOCKING DEVICE
24.03
23.97
24.03
23.97
TRAVEL 26.06
25.94

TABLE I

DASH NO.	PART
-1	RIGHT HAND SLIDE (AS SHOWN)
-2	LEFT HAND SLIDE (OPPOSITE)




.252
.262 DIA AND CSK FARSIDE
99° TO .507 DIA
101° .517
5 PLACES
.62
.64 DIA
ACCESS HOLE
3 PLACES
.77
.74
.252
.262 DIA AND CSK
99° TO .507 DIA
101° .517
9 PLACES
1.02
.98
1.02
.98
5.005
4.995
9.005
8.995
17.01
16.99
21.01
20.99
1.65
1.61
1.88
1.87
4.04
3.96
2.02
1.98
4.005
3.995
8.005
7.995
12.005
11.995
16.01
15.99
21.01
20.99
1.08
1.04
1.52
1.48
1006854

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
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HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Goss DATE 20 Aug 63
CHECKED
APPROVAL
APPROVAL 9/3/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE, CHASSIS,
LOCK OPEN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006854
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03995	17Oct63	W.K.
A	CLASS II CHANGE PER RD-R5587A DR J. Orifice CHK J. Ruggeri APPD H. Maynard	12/11/63	JJS
B	CLASS II CHANGE PER RD-R5708 DR S. Orifice CHK G. Caggiano APPD H. Maynard	2-25-64	JJS
C	REVISED PER TDRR 08881 DR W. Dunn CHK Wolkowicz APPD H. Maynard	6-8-64	KEG

NOTES:

1. GENERAL REQUIREMENTS:
   - A. BLOWERS SHALL BE CAPABLE OF CONFORMING TO THE REQUIREMENTS SPECIFIED BELOW.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, ON THE REAR SURFACE, WITH THE NASA PART NUMBER (DRAWING NUMBER, DASH NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE NASA PART NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, AND DATE OF MANUFACTURE. OTHER MARKING MAY BE APPLIED, BUT THE UNIT SHALL ONLY BE MARKED ON THE REAR SURFACE.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) MATERIAL AND FINISH:

       GRILLE: STEEL, PAINTED WITH ONE COAT OF SEMIGLOSS ENAMEL PER MIL-F-14072. ENAMEL IS TT-E-529, CLASS B, COLOR NUMBER 26440 PER FED-STD-595.

       FLANGE, MOUNTING: STEEL, CADMIUM PLATED PER QQ-P-416, CLASS 2, TYPE II. CHROMATE SHALL BE ELECTRICALLY CONDUCTIVE.

       AIR FILTER: ALUMINUM MESH IN AN ALUMINUM FRAME.

       FAN ENCLOSURE: STEEL, PAINTED SEMIGLOSS LIGHT GRAY ENAMEL PER MIL-F-14072, P211, FILM E.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) POWER CONSUMPTION (MAXIMUM): 1.8 AMPERES AT 115 VRMS, 60 CPS, SINGLE PHASE RUNNING AND 3.5 AMPERES LOCKED ROTOR.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS CONTINUOUS DUTY MINIMUM AT ROOM TEMPERATURE AND HUMIDITY.
   - B. STORAGE LIFE: 1 YEAR MINIMUM.
   - C. CONSTRUCTION: CENTRIFUGAL BLOWER MOUNTED IN A METAL CASE DESIGNED TO FIT STANDARD 19" RACKS.

     INLET AIR IS FILTERED BY A VISCOUS-IMPINGEMENT TYPE, WASHABLE ELEMENT. THE FILTER SHALL REMOVE 85% OF DUST PARTICLES 5 MICRONS AND LARGER WHEN SPRAYED WITH A WATER SOLUBLE ADHESIVE INTENDED FOR THE PURPOSE.
   - D. RF INTERFERENCE: UNITS SHALL BE CAPABLE OF ATTENUATING RF ENERGY 100 DECIBELS IN THE 15 KC TO 10 K MC RANGE. THE UNIT WILL NOT GENERATE RF ENERGY IN ACCORDANCE WITH MIL-I-26600 CLASS III.
   - E. AIR FLOW CHARACTERISTIC: WITH FILTER ELEMENT AND GRILL IN PLACE, THE BLOWER SHALL DELIVER 300 CFM MINIMUM AT 0.3 INCHES (OF WATER COLUMN) STATIC PRESSURE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

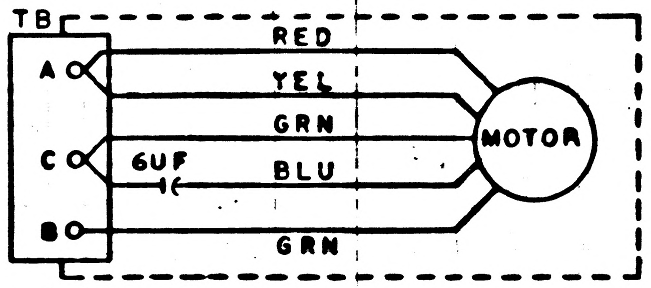
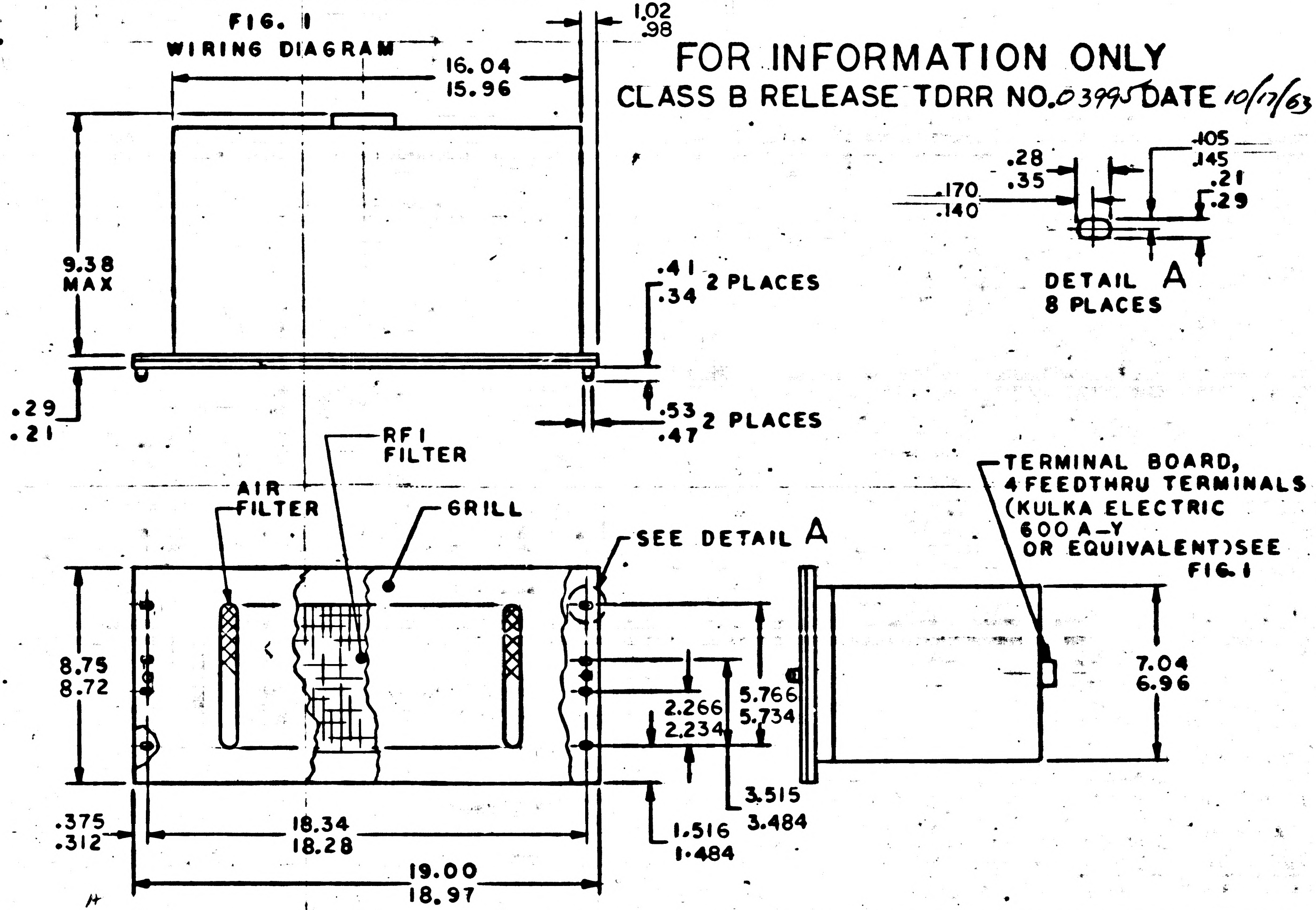


FIG. 1
WIRING DIAGRAM

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03995 DATE 10/17/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN M. S. G. Crespi DATE 17 Aug 63
CHECKED J. Ruggeri H. Maynard
APPROVAL H. Morin 4 Oct 63
APPROVAL JJS 10/4/63
APPROVAL 10/4/63
NASA APPROVAL 10/11/63
MIT APPROVAL 10/15/63
MIT APPROVAL 17 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FAN, VENTILATING, RFI & DUST FILTER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006856
SCALE NONE
WT
SHEET 1 OF 1

1006856

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03995	17Oct63	WK

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNITS SHALL BE CAPABLE OF CONFORMING TO THE REQUIREMENTS OF MIL-B-23071 WITH THE EXCEPTIONS AND PARTICULAR REQUIREMENTS SPECIFIED BELOW.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, ON THE REAR SURFACE, WITH THE NASA PART NUMBER (DRAWING NUMBER, DASH NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE NASA PART NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, AND DATE OF MANUFACTURE. OTHER MARKING MAY BE APPLIED, BUT THE UNIT SHALL ONLY BE MARKED ON THE REAR SURFACE.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)

   A. MECHANICAL PROPERTIES:

      [illegible]

      (1) MATERIAL AND FINISH:
      GRILLE: STEEL, PAINTED WITH ONE COAT OF SEMIGLOSS ENAMEL PER MIL-F-14072. ENAMEL IS TT-E-529, CLASS B, COLOR NUMBER 26440 PER FED-STD-595.

      FLANGE, MOUNTING: STEEL, CADMIUM PLATED PER QQ-P-416, CLASS 2, TYPE II. CHROMATE SHALL BE ELECTRICALLY CONDUCTIVE.

      AIR FILTER: ALUMINUM MESH IN AN ALUMINUM FRAME ALL CHROMATED PER MIL-C-5541.

      FAN ENCLOSURE: STEEL, PAINTED SEMIGLOSS LIGHT GRAY ENAMEL PER MIL-F-14072, P211, FILM E.

   B. ELECTRICAL CHARACTERISTICS:

      (1) POWER CONSUMPTION (MAXIMUM): 1.8 AMPERES AT 115 VRMS, 60 CPS, SINGLE PHASE RUNNING AND 3.5 AMPERES LOCKED ROTOR.

3. DESIGN REQUIREMENTS:

   A. OPERATING LIFE: 2000 HOURS CONTINUOUS DUTY MINIMUM AT ROOM TEMPERATURE AND HUMIDITY.

   B. STORAGE LIFE: 1 YEAR MINIMUM.

   C. CONSTRUCTION: CENTRIFUGAL BLOWER MOUNTED IN A METAL CASE DESIGNED TO FIT STANDARD 19" RACKS.

      INLET AIR IS FILTERED BY A VISCOUS-IMPINGEMENT TYPE, WASHABLE ELEMENT. THE FILTER SHALL REMOVE 85% OF DUST PARTICLES 5 MICRONS AND LARGER WHEN SPRAYED WITH OIL INTENDED FOR THE PURPOSE.

   D. RF INTERFERENCE: UNITS SHALL BE CAPABLE OF ATTENUATING RF ENERGY 100 DECIBELS IN THE 15 KC TO 10 K MC RANGE. THE UNIT WILL NOT GENERATE RF ENERGY IN ACCORDANCE WITH MIL-I-26600 CLASS III.

   E. AIR FLOW CHARACTERISTIC: WITH FILTER ELEMENT AND GRILL IN PLACE, THE FAN SHALL DELIVER 300 CFM MINIMUM AT 0.3 INCHES (OF WATER COLUMN) STATIC PRESSURE.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

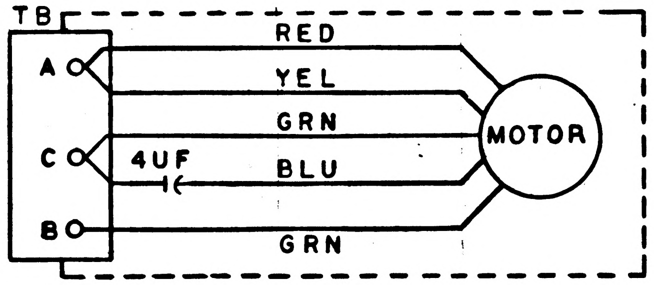
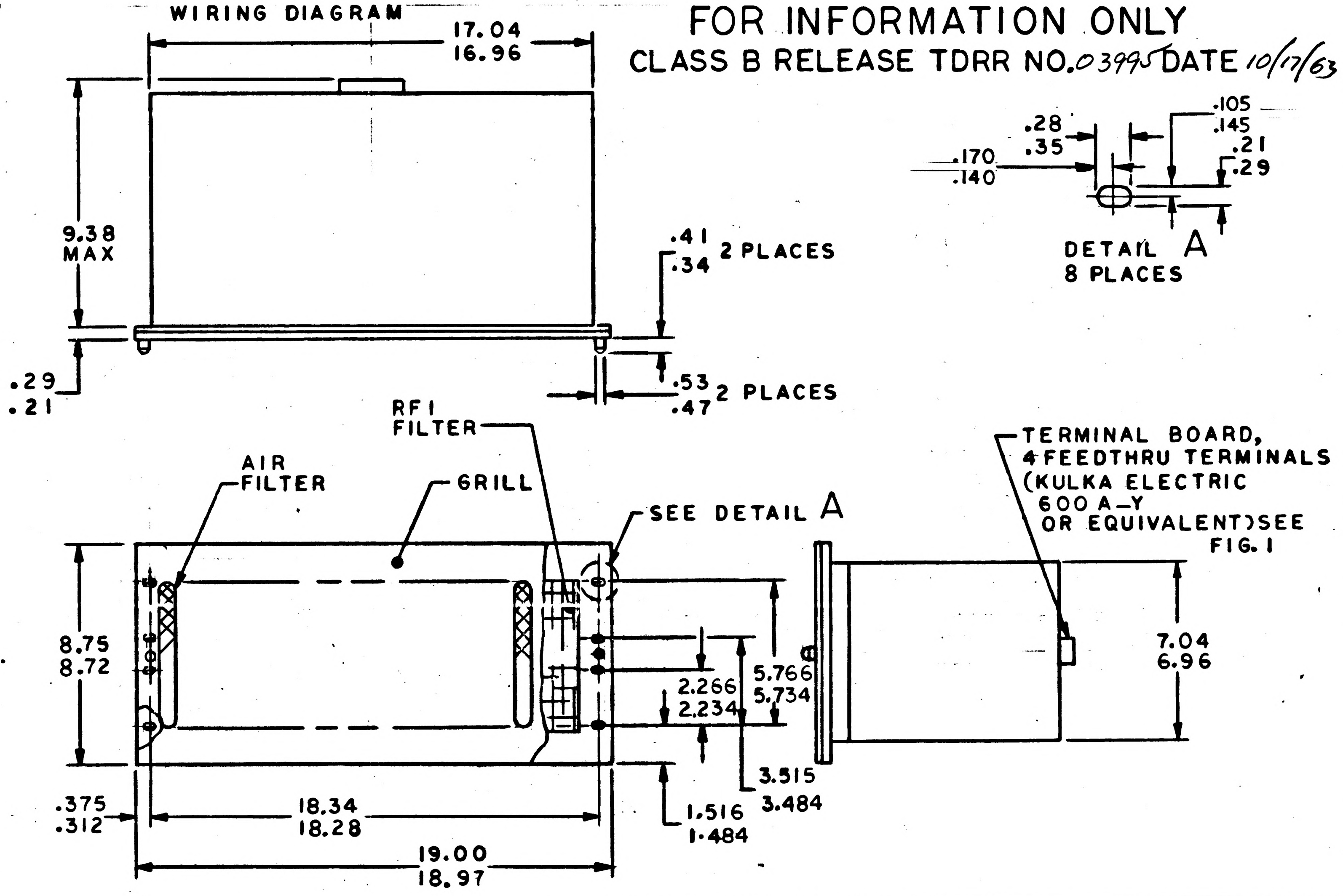


FIG. 1
WIRING DIAGRAM

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 03995 DATE 10/17/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN J. C. Crespi DATE 17 Jul 63
CHECKED J. Ruggeri
APPROVAL H. Morse 4 Oct
APPROVAL 10/4/63
APPROVAL J. I. 10/4/63
NASA APPROVAL 10/17/63
MIT APPROVAL 10/15/63
MIT APPROVAL 17 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FAN, VENTILATING, RFI & DUST FILTER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006856
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006856

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS 03584			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 03584		

DASH NO.	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E	DIM. F
-1	5.25 MAX	3.54 MAX	1.54 1.46	2.29 2.21	-	-
-2	7.00 MAX	5.29 MAX	1.54 1.46	2.29 2.21	-	-
-3	8.75 MAX	7.04 MAX	1.54 1.46	2.29 2.21	3.64 3.46	5.79 5.71

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 03584 DATE 3 Oct 63

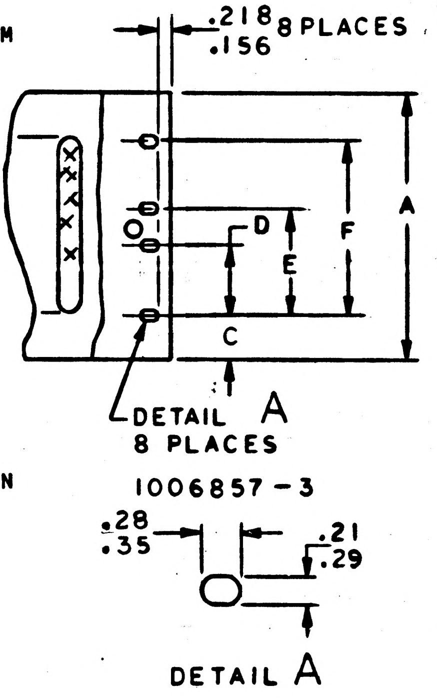
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL MEET THE RFI REQUIREMENTS OF MIL-I-6181 WHEN PROPERLY INSTALLED. IN A STANDARD 19 INCH RACK.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130 WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER). UNIT MARKING MUST NOT APPEAR ON FRONT PANEL (GRILLE). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. CERTIFICATION: MATERIAL AND FINISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.

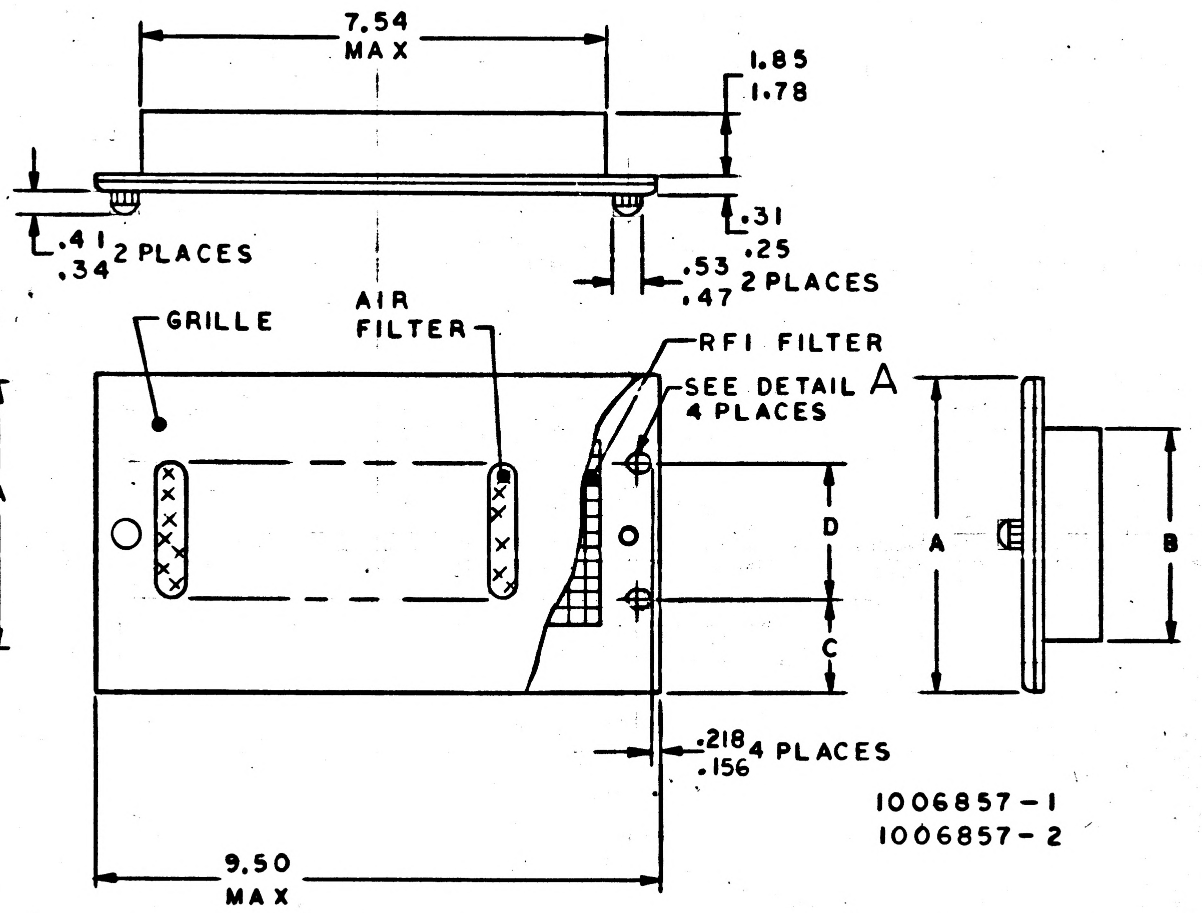
3 DESIGN REQUIREMENTS:

A. OPERATING LIFE: INDEFINITE, AIR FILTER ELEMENT MUST BE WASHED PERIODICALLY FOR EFFICIENCY.

3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION:
     - (1) MATERIAL AND FINISH: 16 GAGE COLD ROLLED STEEL, CADMIUM PLATED AND CHROMATED PER QQ-P-416, CLASS 3, TYPE II. GRILLE SHALL BE PAINTED ONE COAT LIGHT GREY SEMIGLOSS ENAMEL TT-E-529, CLASS B PER MIL-F-14072. COLOR SHALL BE NO. 26440 OF FED-STD-595. FILTER ELEMENT SHALL BE ALUMINUM IRRIDITED PER MIL-C-5540.
     - (2) CONFIGURATION: ADAPTER FLANGE CONTAINING A FIXED RFI FILTER AND REMOVABLE WASHABLE AIR FILTER ELEMENT HELD IN PLACE BY A GRILLE COVER.
4. PERFORMANCE:
   - A. AIR FLOW: UNITS SHALL BE CAPABLE OF PASSING THE AMOUNT OF AIR AT THE PRESSURES LISTED IN TABLE I.
   - B. RFI ATTENUATION: UNIT SHALL BE CAPABLE OF 100 DB ATTENUATION TO FREQUENCIES FROM 15 KILOCYCLES TO 10 KILOMEGACYCLES. MEASUREMENTS SHALL BE PER MIL-I-16910A, CLASS III.
   - C. DUST FILTERING: UNITS SHALL BE CAPABLE OF ARRESTING AND RETAINING 85% OF PARTICLES 5 MICRONS AND LARGER WHEN THE ELEMENT IS SPRAYED WITH OIL INTENDED FOR THE PURPOSE.



1006857-3



1006857-1
1006857-2

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN D.C. Cresp DATE 27 Aug 63
CHECKED J. Ruggeri 13 Sept 63
APPROVAL C. Spirlin
APPROVAL J. Yakerich 9/20/63
APPROVAL J. J. Pounds 9/20/63
NASA APPROVAL W. J. 10-3-63
MIT APPROVAL 10/2/63
MIT APPROVAL 3 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FILTER, AIR CONDITIONING
RFI SHIELDED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006857
SCALE NONE | WT | SHEET 1 OF 1

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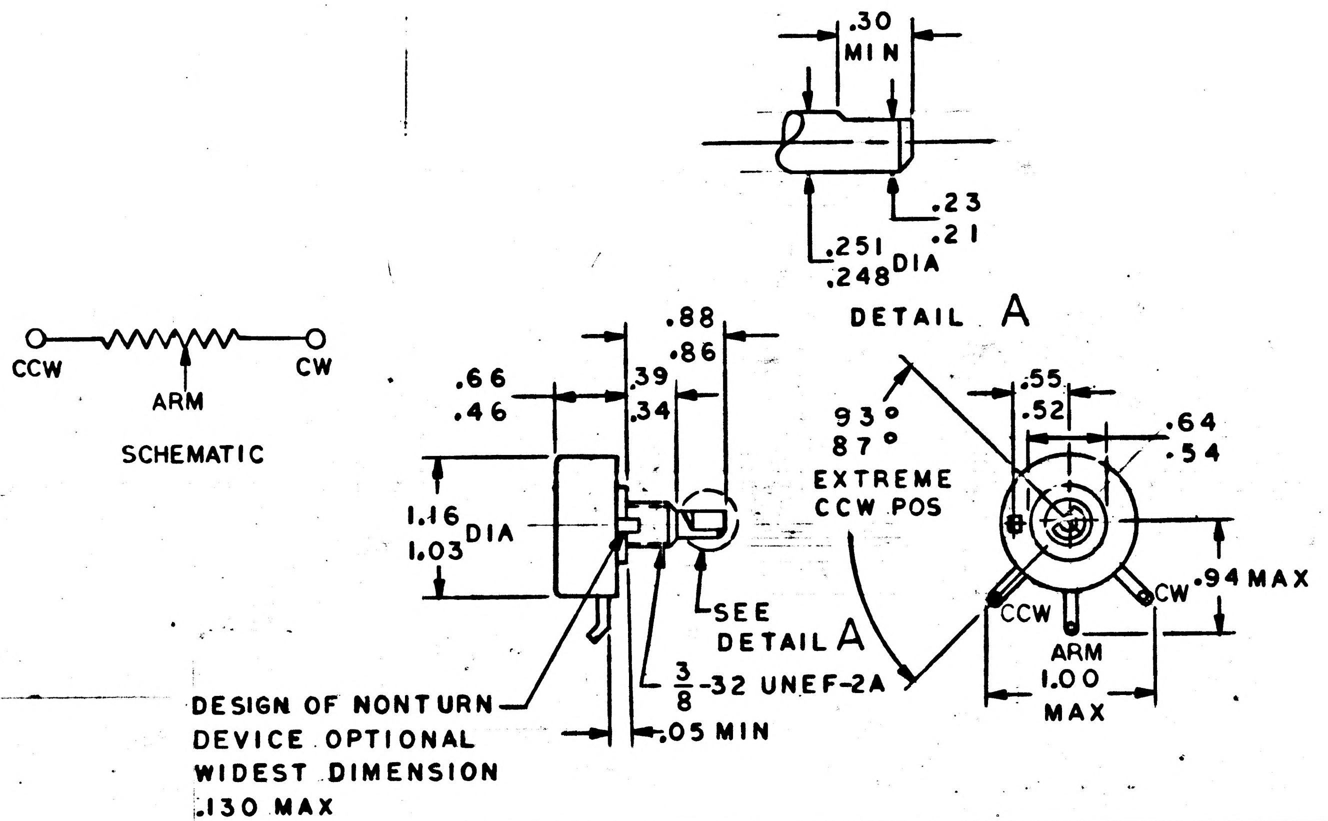
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

REQUIREMENTS:

1. GENERAL:
   - A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-94, TYPE RV4NAYSK102A WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER, RESISTANCE VALUE, TOLERANCE AND WATTAGE RATING. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SEE SKETCH.
   - B. FOR ALL OTHER PROPERTIES AND CHARACTERISTICS REFER TO MIL-R-95/5A FOR TYPE AS SPECIFIED ABOVE.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02385 DATE 7 Aug 63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crespi DATE 19 June 63
CHECKED 28 JUNE 63
APPROVAL 7/17/63
APPROVAL 7/24/63
APPROVAL 7/26/63
NASA APPROVAL 8/7/63
MIT APPROVAL 8/7/63
MIT APPROVAL 6 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE, COMPOSITION, 2 WATT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006858
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	REVISED PER TDRR 06339 DR C. LaCorte CHK A. Cappiano APPD	20 FEB 64	3/10/64 WK.

NOTES:

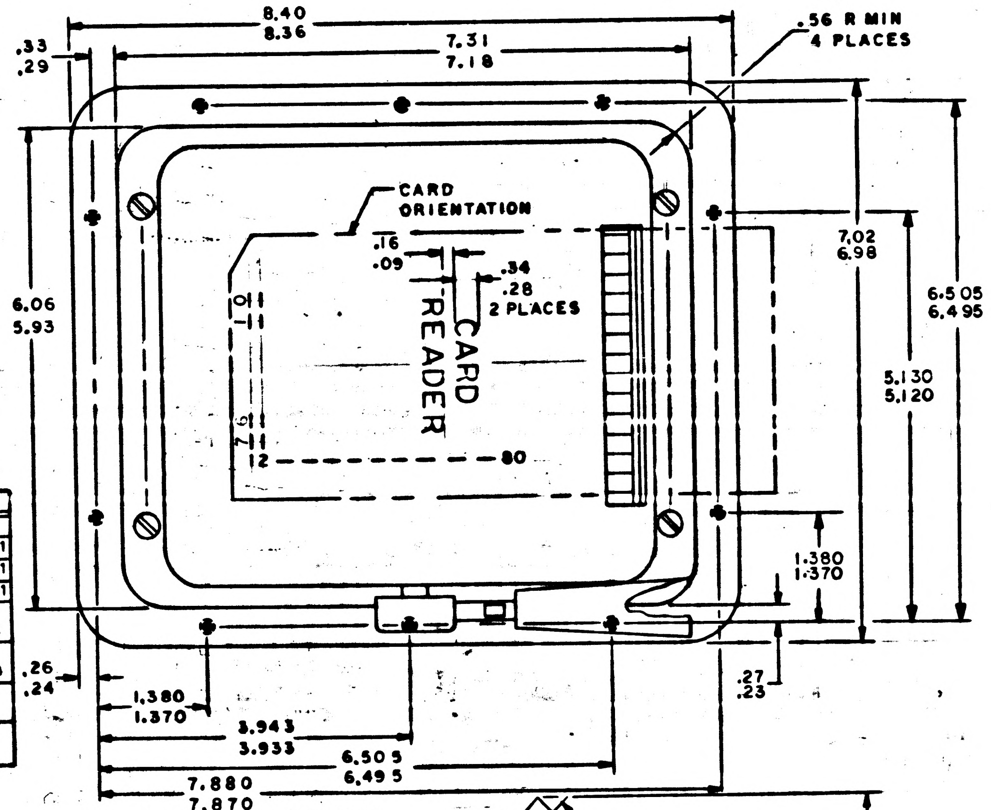
1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NO. AND REVISION LETTER, IF ANY), TERMINAL IDENTITY, TERMINAL BLOCK IDENTITY, SWITCH AND SWITCH TERMINAL IDENTITY, MANUFACTURER'S NAME, SERIAL NO., MODEL NO. AND NASA PART NUMBER SHALL APPEAR ON SURFACE "B" ONLY.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) HARDWARE: COVER HOLD DOWN SCREWS SHALL BE STAINLESS STEEL, CROSS-RECESSED HEAD, MILITARY STANDARD TYPE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) SWITCH ARRANGEMENT: SEE SHEET 2.
     - (2) CONTACT RESISTANCE: WHEN MEASURED AT THE TAPER PIN BLOCK, SHALL NOT EXCEED 200 MILLIOHMS AT 100 MILLIAMPERES.
     - (3) INSULATION RESISTANCE: GREATER THAN 100 MEGOHMS AT 500 VDC.
     - (4) CONTINUITY: WITH HANDLE IN CLOSED (READ CARD) POSITION UNLESS SPECIFIED.

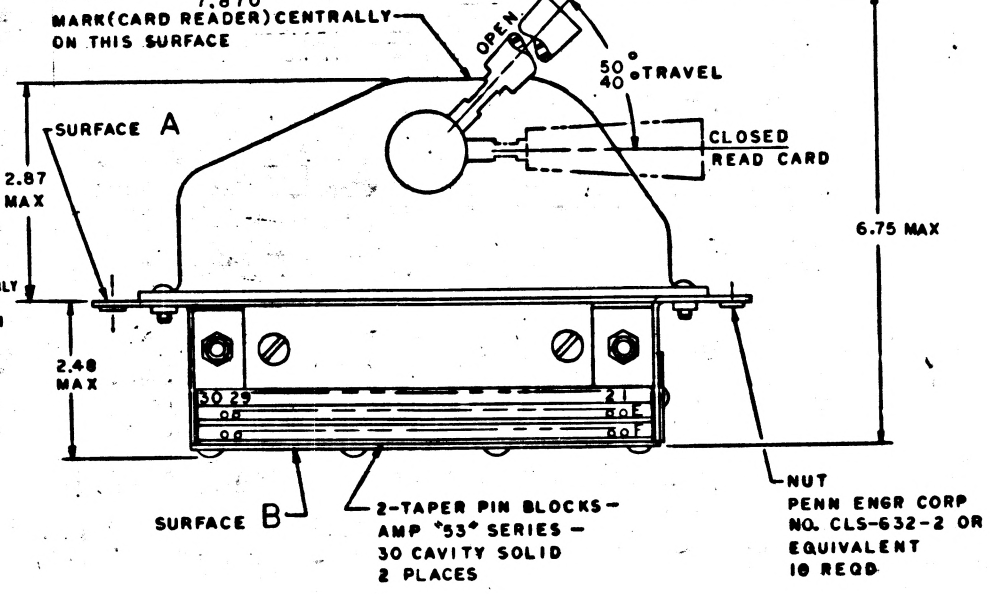
CARD CONDITION (NOTE 3.E)	SWITCH CONTINUITY (SEE SHEET 2)
ANY CARD (INSERT FULLY AS SHOWN)	READ CONTINUITY BETWEEN TERM. B1-F1
ANY CARD (WITHDRAW CARD .25 INCH)	READ NO CONTINUITY BETWEEN TERM. B1-F1
ANY CARD (REVERSED, INSERT FULLY)	READ NO CONTINUITY BETWEEN TERM. B1-F1
ANY CARD (AS SHOWN, HANDLE OPEN)	READ NO CONTINUITY BETWEEN TERM. B1-F1
BLANK CARD (NO HOLES)	READ CONTINUITY BETWEEN COM AND NO READ NO CONTINUITY BETWEEN COM AND NC
120 HOLES IN ROWS 0,1,6,7; COLUMNS 1-10, 15-24, 29-38	READ CONTINUITY BETWEEN COM AND NC READ NO CONTINUITY BETWEEN COM AND NO
60 HOLES IN ROWS 0 AND 6; COLUMNS 1-10, 15-24, 29-38. NO HOLES IN ROWS 1 AND 7	READ NO CONTINUITY BETWEEN COM AND EITHER NC OR NO
60 HOLES IN ROWS 1 AND 7; COLUMNS 1-10, 15-24, 29-38. NO HOLES IN ROWS 0 AND 6	READ CONTINUITY BETWEEN COM AND EITHER NC OR NO

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 50,000 CYCLES MINIMUM (1 CYCLE EQUALS A MAKE AND A BREAK OF 0.5 AMPERE 28 VDC RESISTIVE LOAD).
   - B. STORAGE LIFE: 1 YEAR MINIMUM IN STANDARD ENVIRONMENT WITHOUT ELECTRICAL OR MECHANICAL DETERIORATION.
   - C. CONSTRUCTION:
     - (1) MATERIAL: STAINLESS STEEL, PLASTICS, AND ALUMINUM.
     - (2) FINISH: PASSIVATE STAINLESS STEEL, ANODIZE ALUMINUM PARTS. HANDLE GRIP TO BE BLACK. SURFACE A SHALL BE ELECTRICALLY CONDUCTIVE.
     - (3) HOOK-UP WIRE: [illegible]-16878/4A OR EQUIVALENT.
     - (4) RADIO FREQUENCY INTERFERENCE: UNITS SHALL OPERATE SATISFACTORILY DURING EXPOSURE TO CONDUCTED AND RADIATED INTERFERENCE. THEY SHALL NOT GENERATE ANY CONDUCTED OR RADIATED INTERFERENCE WHICH WILL ADVERSELY AFFECT OTHER EQUIPMENT. UNITS SHALL MEET THE REQUIREMENTS OF MIL-I-26600, CLASS 3.
   - D. CARDS: UNITS SHALL ACCEPT AND READ STANDARD IBM PUNCH CARDS (12 X 80 MATRIX, 960 HOLE CAPACITY AS DEFINED JUNE, 1962 BY TASK FORCE TR-27.6.1 OF EIA ENGINEERING COMMITTEE TR-27.6).
   - E. CONTACT RATING: 0.5 AMPERES AT 28 VDC.
   - F. ENVIRONMENTAL: UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF ND 1002018.
   - G. UNITS SHALL BE SUPPLIED WITH 2 OPERATING AND INSTRUCTION MANUALS.

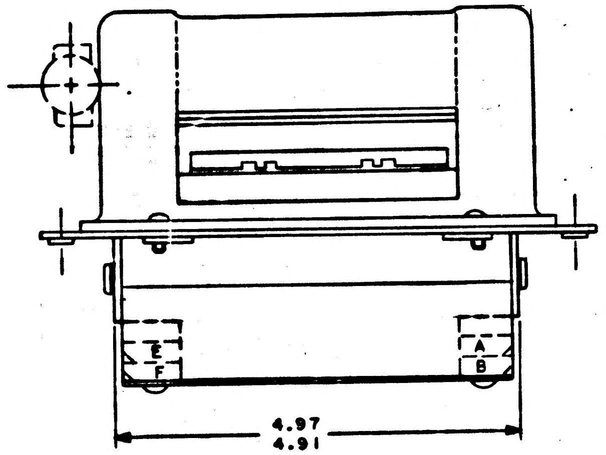
ORIGINAL SOURCE OF SUPPLY:

DREXEL DYNAMICS CORP.
HORSHAM, PENNSYLVANIA
CODE IDENT NO. 07443
PART NO. [illegible] (AS MODIFIED ABOVE)




MARK (CARD READER) CENTRALLY ON THIS SURFACE
OPEN
50°
40° TRAVEL
CLOSED
READ CARD
SURFACE A
2.87
MAX
6.75 MAX
2.48
MAX
30 29
2 1
E
F
SURFACE B
2-TAPER PIN BLOCKS – AMP "53" SERIES – 30 CAVITY SOLID 2 PLACES
NUT PENN ENGR CORP NO. CLS-632-2 OR EQUIVALENT 10 REQD

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02911 DATE 9-5-63



A	-
-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-[illegible]
DRAWN C. Caropi DATE 5 Aug 63
CHECKED A.J. Marinaro
APPROVAL
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NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD READER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006863
SCALE NONE
WT
SHEET 1 OF 2

1006863

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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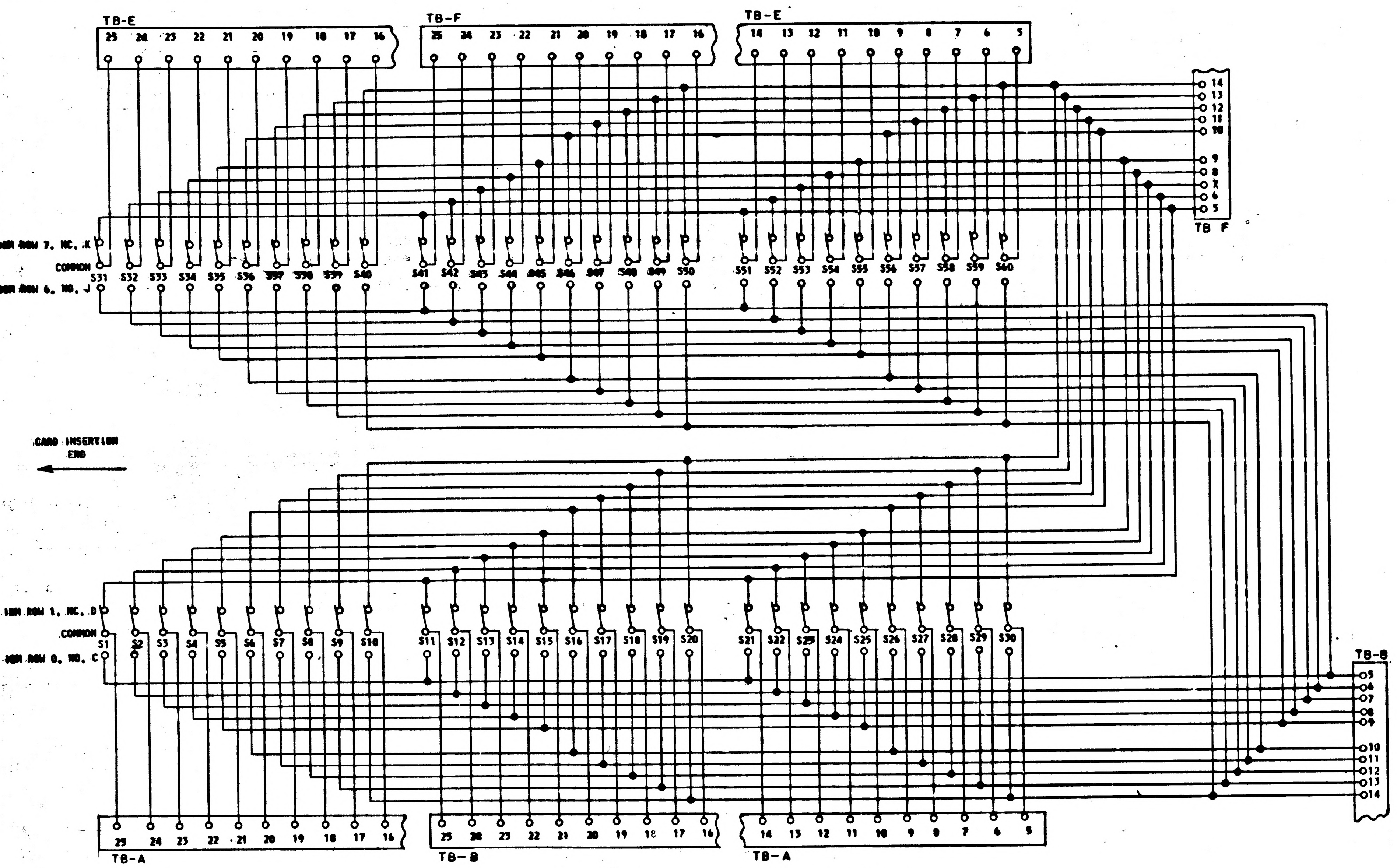
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
A	Revised per TDRR 06359	3/10/64	WK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TB-F
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TB-E
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TB F
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IBM ROW 7, NC, K
COMMON
IBM ROW 6, NO, J
S31 S32 S33 S34 S35 S36 S37 S38 S39 S40
S41 S42 S43 S44 S45 S46 S47 S48 S49 S50
S51 S52 S53 S54 S55 S56 S57 S58 S59 S60
CARD INSERTION END
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COMMON
IBM ROW 0, NO, C
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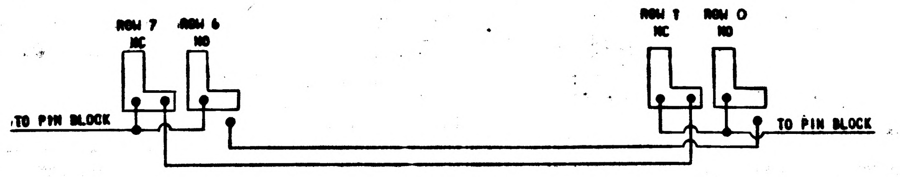
S11 S12 S13 S14 S15 S16 S17 S18 S19 S20
S21 S22 S23 S24 S25 S26 S27 S28 S29 S30
TB-B
5 6 7 8 9 10 11 12 13 14
25 24 23 22 21 20 19 18 17 16
TB-A
25 24 23 22 21 20 19 18 17 16
TB-B
14 13 12 11 10 9 8 7 6 5
TB-A

SWITCH SCHEMATIC AS VIEWED FROM READER BOTTOM

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02911 **DATE** 9-5-63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ROW 6
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ROW 1
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ROW 0
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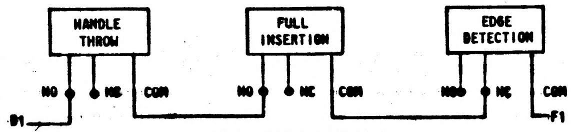
TYPICAL SECTION
VIEWED FROM CARD INSERTION END


HANDLE THROW
FULL INSERTION
EDGE DETECTION
NO
NC
COM
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MICRO-SWITCH SCHEMATIC

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN R. Wheeler DATE 2 Aug 63
CHECKED J. Ruggeri 5 Aug 63
APPROVAL C [illegible] 19 Aug 63
APPROVAL [illegible] 8/23/63
APPROVAL [illegible] 9/11/63
NASA APPROVAL [illegible] 9/4/63
MIT APPROVAL [illegible] 9/5/63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD READER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	D	1006863
SCALE NONE	WT	SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

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NOTES:

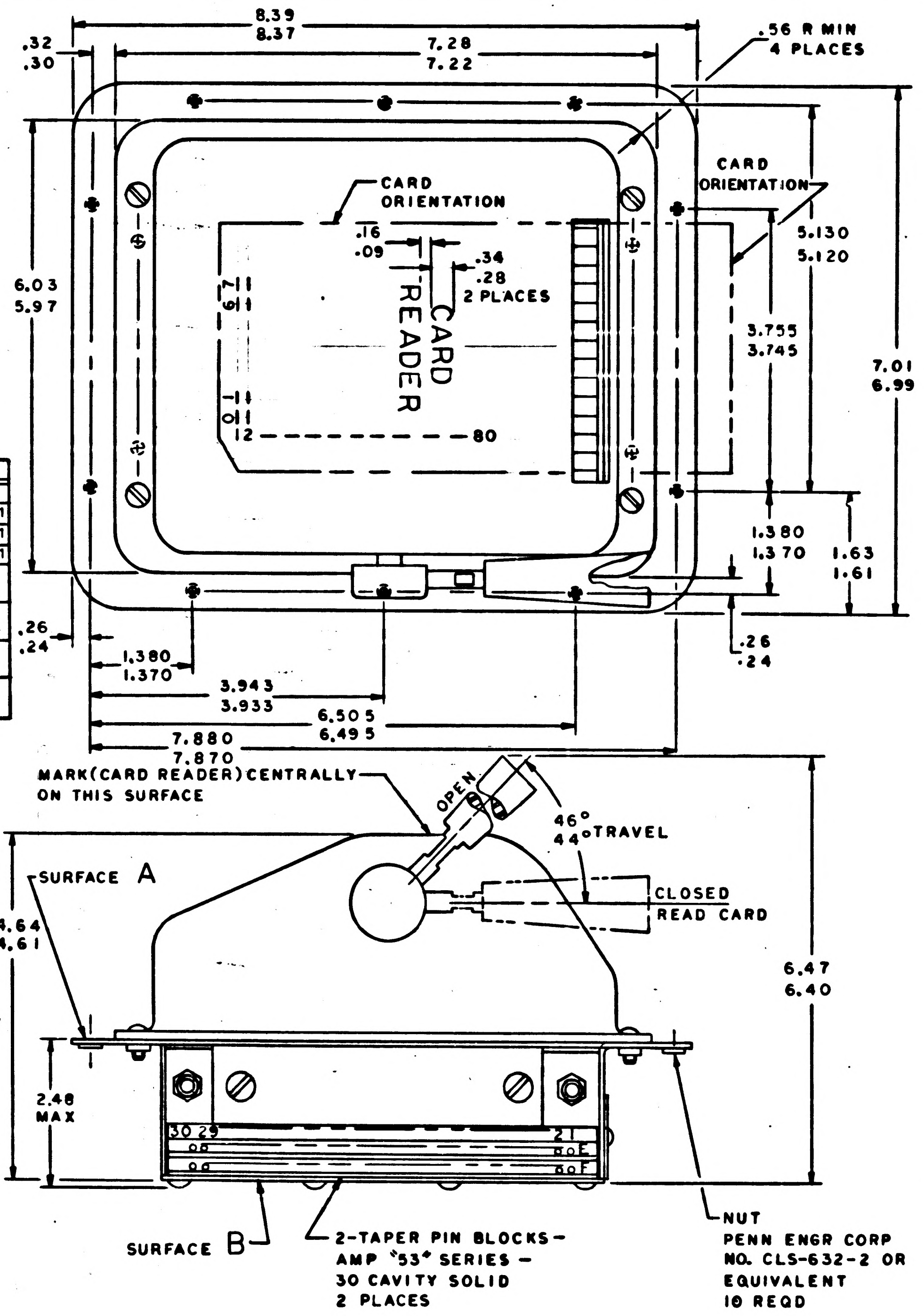
1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NO. AND REVISION LETTER, IF ANY), TERMINAL IDENTITY, TERMINAL BLOCK IDENTITY, SWITCH AND SWITCH TERMINAL IDENTITY. MANUFACTURER'S NAME AND NASA PART NUMBER SHALL APPEAR ON SURFACE "B" ONLY.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) HARDWARE: COVER HOLD DOWN SCREWS SHALL BE STAINLESS STEEL, CROSS-RECESSED HEAD, MILITARY STANDARD TYPE.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) SWITCH ARRANGEMENT: SEE SHEET 2.
     - (2) CONTACT RESISTANCE: LESS THAN 50 MILLIOHMS AT 100 MILLIAMPERES.
     - (3) INSULATION RESISTANCE: GREATER THAN 100 MEGOHMS AT 500 VRMS.
     - (4) CONTINUITY: WITH HANDLE IN CLOSED (READ CARD) POSITION UNLESS SPECIFIED.

CARD CONDITION (NOTE 3.E)	SWITCH CONTINUITY (SEE SHEET 2)
ANY CARD (INSERT FULLY AS SHOWN)	READ CONTINUITY BETWEEN TERM. B1-F1
ANY CARD (WITHDRAW CARD .25 INCH)	READ NO CONTINUITY BETWEEN TERM. B1-F1
ANY CARD (REVERSED, INSERT FULLY)	READ NO CONTINUITY BETWEEN TERM. B1-F1
ANY CARD (AS SHOWN, HANDLE OPEN)	READ NO CONTINUITY BETWEEN TERM. B1-F1
BLANK CARD (NO HOLES)	READ CONTINUITY BETWEEN COM AND NO READ NO CONTINUITY BETWEEN COM AND NC
120 HOLES IN ROWS 0,1,6,7; COLUMNS 1-10,15-24,30-39	READ CONTINUITY BETWEEN COM AND NC READ NO CONTINUITY BETWEEN COM AND NO
60 HOLES IN ROWS 0 AND 6; COLUMNS 1-10, 15-24,30-39. NO HOLES IN ROWS 1 AND 7	READ NO CONTINUITY BETWEEN COM AND EITHER NC OR NO
60 HOLES IN ROWS 1 AND 7; COLUMNS 1-10, 15-24,30-39. NO HOLES IN ROWS 0 AND 6	READ CONTINUITY BETWEEN COM AND EITHER NC OR NO

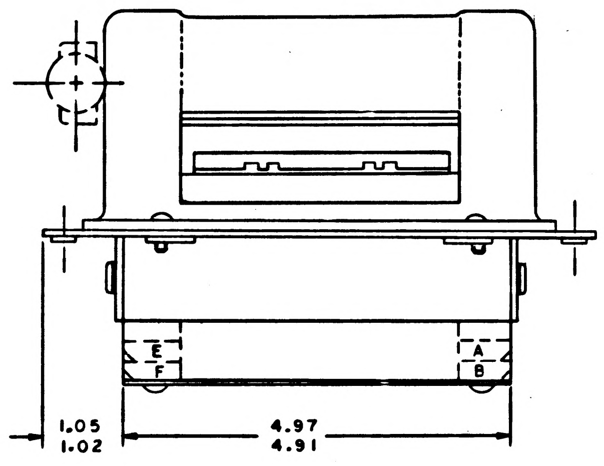
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 50,000 CYCLES MINIMUM (1 CYCLE EQUALS A MAKE AND A BREAK OF 0.5 AMPERE 28 VDC RESISTIVE LOAD).
   - B. STORAGE LIFE: 1 YEAR MINIMUM IN STANDARD ENVIRONMENT WITHOUT ELECTRICAL OR MECHANICAL DETERIORATION.
   - C. CONSTRUCTION:
     - (1) MATERIAL: STEEL, CADMIUM PLATED PER MIL-F-14072.
     - (2) FINISH: PAINT EXPOSED METAL SURFACES (EXCEPT SURFACE "A" AND HANDLE) WITH SEMIGLOSS LIGHT GRAY ENAMEL TT-E-529, CLASS B, PER MIL-F-14072, P372. (COLOR NO. 26440 OF FED-STD-595). HANDLE TO BE DULL BLACK (MIL-F-14072, P372, FILM B). SURFACE A SHALL BE ELECTRICALLY CONDUCTIVE CHROMATE FILM.
     - (3) HOOK-UP WIRE: PER MIL-W-16878/4A OR EQUIVALENT.
     - (4) RADIO FREQUENCY INTERFERENCE: UNITS SHALL OPERATE SATISFACTORILY DURING EXPOSURE TO CONDUCTED AND RADIATED INTERFERENCE. THEY SHALL NOT GENERATE ANY CONDUCTED OR RADIATED INTERFERENCE WHICH WILL ADVERSELY AFFECT OTHER EQUIPMENT. UNITS SHALL MEET THE REQUIREMENTS OF MIL-I-26600, CLASS 3.
   - D. CARDS: UNITS SHALL ACCEPT AND READ STANDARD IBM PUNCH CARDS (12 X 80 MATRIX, 960 HOLE CAPACITY AS DEFINED JUNE, 1962 BY TASK FORCE TR-27.6.1 OF EIA ENGINEERING COMMITTEE TR-27.6).
   - E. CONTACT RATING: 0.5 AMPERES AT 28 VDC.
   - F. ENVIRONMENTAL: UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF ND 1002018.
   - G. UNITS SHALL BE SUPPLIED WITH 2 OPERATING AND INSTRUCTION MANUALS.

ORIGINAL SOURCE OF SUPPLY:

DREXEL DYNAMICS CORP.
HORSHAM, PENNSYLVANIA
CODE IDENT NO. 07443
PART NO. 2545-1398 (AS MODIFIED ABOVE)



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02911 DATE 9-5-63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE
CHECKED 5 AUG '63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD READER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006863
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006863

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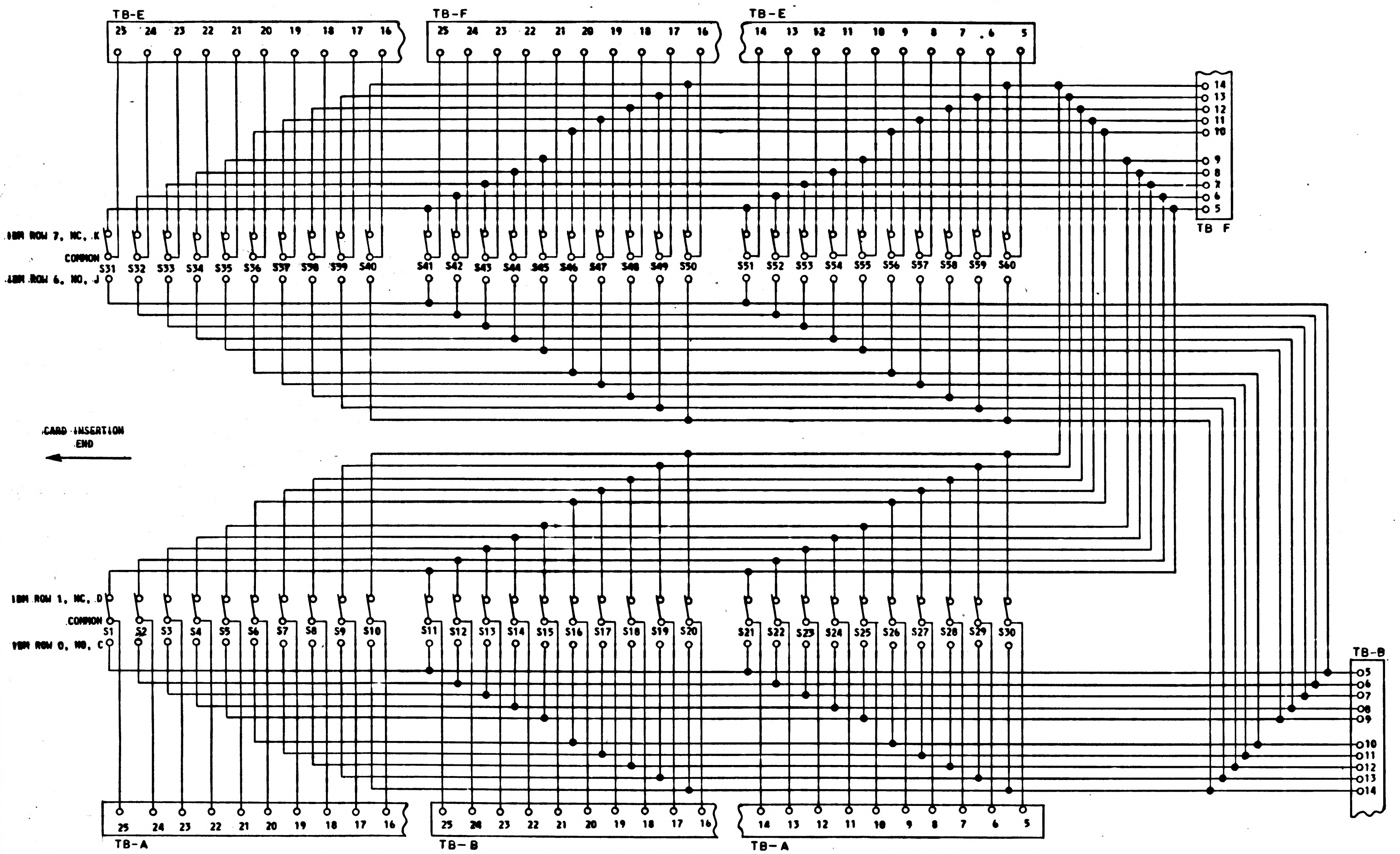
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED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25 24 23 22 21 20 19 18 17 16
TB-F
25 24 23 22 21 20 19 18 17 16
TB-E
14 13 12 11 10 9 8 7 6 5
TB F
14 13 12 11 10 9 8 7 6 5
IBM ROW 7, NC, K
COMMON
IBM ROW 6, NO, J
S31 S32 S33 S34 S35 S36 S37 S38 S39 S40
S41 S42 S43 S44 S45 S46 S47 S48 S49 S50
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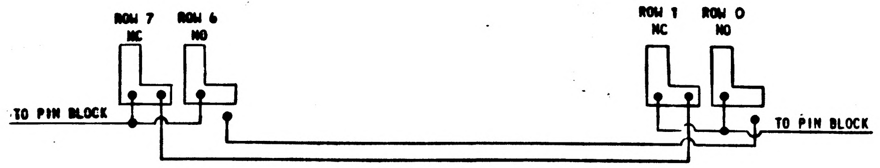
CARD INSERTION END
IBM ROW 1, NC, D
COMMON
IBM ROW 0, NO, C
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10
S11 S12 S13 S14 S15 S16 S17 S18 S19 S20
S21 S22 S23 S24 S25 S26 S27 S28 S29 S30
TB-B
5 6 7 8 9 10 11 12 13 14
25 24 23 22 21 20 19 18 17 16
TB-A
25 24 23 22 21 20 19 18 17 16
TB-B
14 13 12 11 10 9 8 7 6 5
TB-A

SWITCH SCHEMATIC AS VIEWED FROM READER BOTTOM

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02911 DATE 9-5-63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ROW 6
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ROW 1
NC
ROW 0
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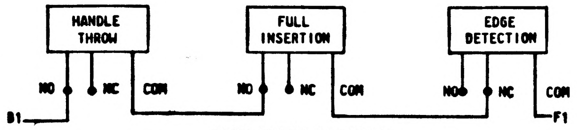
TO PIN BLOCK
TO PIN BLOCK

TYPICAL SECTION
VIEWED FROM CARD INSERTION END


HANDLE THROW
FULL INSERTION
EDGE DETECTION
NO
NC
COM
NO
NC
COM
NO
NC
COM
B1
F1

MICRO-SWITCH SCHEMATIC

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN R. Wheeler DATE 2 Aug 63
CHECKED J. Ruggeri 5 AUG 63
APPROVAL C. Spri[illegible] 19 Aug 63
APPROVAL [illegible] 8/23/63
APPROVAL [illegible] 9/9/63
NASA APPROVAL [illegible] 9/5/63
MIT APPROVAL [illegible] 9/5/63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CARD READER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006863
SCALE NONE
WT
SHEET 2 OF 2

1006863

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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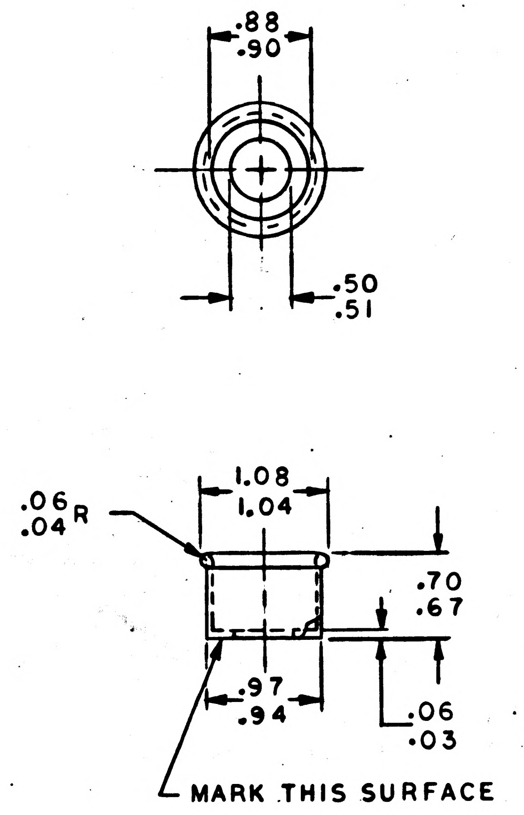
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 01753		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. EACH PART SHALL BE PERMANENTLY AND LEGIBLY MARKED IN ACCORDANCE WITH MIL-STD-130 ON THE SURFACE INDICATED, WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) MATERIAL: ALUMINUM ALLOY PER QQ-A-365, TEMPER T3.
     - (2) FINISH: ANODIZE PER MIL-A-8625, TYPE II, COLOR RED.
   - B. DOCUMENTATION: A CERTIFICATE OF COMPLIANCE WITH MATERIAL REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01753 DATE 26 June 63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crespi DATE 31 May 63
CHECKED J. Ruggeri 7 JUNE 63
APPROVAL 6/17/63
APPROVAL 6/17/63
APPROVAL 6/17/63
NASA APPROVAL 6-26-63
MIT APPROVAL 26 Jun 63
MIT APPROVAL L. Gediman 6/25/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GUARD, PUSH BUTTON SWITCH

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006865
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006865

INCHES 0 1 2
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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 01856	7/2/63	

REQUIREMENTS:

1. GENERAL:

A. UNITS SHALL MEET THE REQUIREMENTS OF MIL-R-93 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

C. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, RESISTANCE VALUE, TOLERANCE, VOLTAGE RATING AND WATTAGE RATING. PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, DATE OF MANUFACTURE OR CODING, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL REQUIREMENTS:

(1) DIMENSIONS: SEE SKETCH.

B. ELECTRICAL CHARACTERISTICS:

(1) RESISTANCE VALUE: SEE TABLE.

(2) RESISTANCE TOLERANCE: ± 0.01 PERCENT.

3. DESIGN:

A. POWER RATING: 1/4 WATT AT 125°C.

B. TEMPERATURE COEFFICIENT: 10 PPM/°C BETWEEN 25°C AND 35°C.

C. VOLTAGE RATING: 150 VOLTS MAXIMUM.

D. SHALL NOT BE WOUND WITH WIRE LESS THAN 0.0008 INCH DIAMETER.

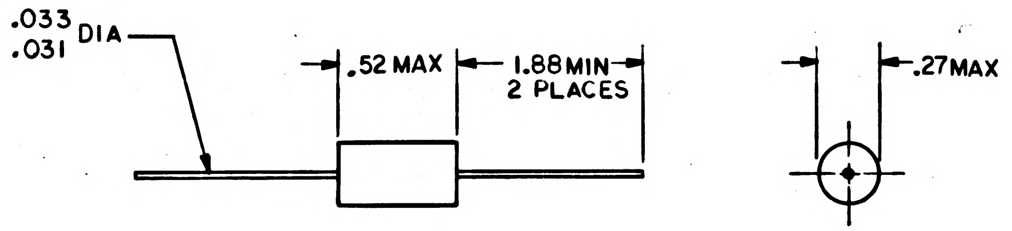
E. CASING: SEALED BY COMPRESSION MOLDING IN AN ALKYD RESIN.

F. LEADS: UNITS SHALL HAVE WELDABLE DUMET LEADS PER NASA DOCUMENT PS 1015401.

A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

LEAD BEND (DESTRUCTIVE): EACH LEAD SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE COMPONENT BODY SHALL BE HELD IN A VERTICAL POSITION WITH A ONE-POUND WEIGHT SUSPENDED FROM THE LEAD UNDER TEST. ONE CYCLE OF BENDING SHALL BE ACCOMPLISHED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT WHILE IN THE SAME PLANE, THROUGH 90 DEGREES IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

G. LEAD PULL: EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 5 POUNDS MINIMUM FOR ONE MINUTE.



DASH NO.	RESISTANCE VALUE-OHMS
-1	50,000
-2	100,000

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 01856 DATE 7/2/63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 5 June 63
CHECKED June 63
APPROVAL Jan 21, 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 7/2/63
MIT APPROVAL 7/2/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, FIXED, WIREWOUND

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006868

SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006868

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
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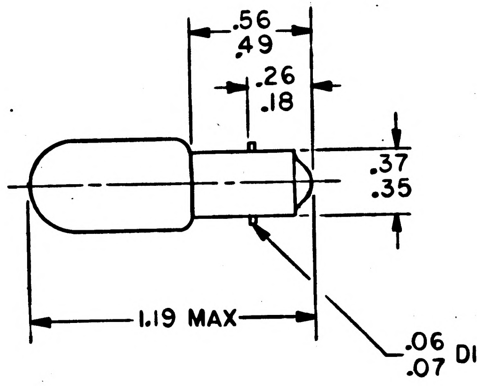
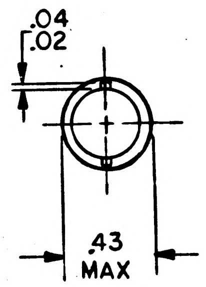
REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME OR SYMBOL, TYPE NUMBER, ELECTRICAL RATINGS, AND NASA DRAWING NUMBER AND REVISION LETTER. UNIT PACKAGES SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. ELECTRICAL CHARACTERISTICS:
     - (1) INITIAL STARTING VOLTAGE: 95 VOLTS AC MAXIMUM, OVER 135 VOLTS DC.
   - B. MECHANICAL CHARACTERISTICS:
     - (1) DIMENSIONS AND TOLERANCES PER OUTLINE.
3. DESIGN:
   - A. POWER RATING: 1/7 WATT NOMINAL.
   - B. CURRENT RATING: 1.2 MILLIAMPERE NOMINAL.
   - C. OPERATING VOLTAGE: FROM 105 TO 125 VOLTS AC, 150 VOLTS DC.
   - D. THIS GLOW LAMP SHALL BE DESIGNED FOR USE IN SERIES WITH AN EXTERNAL RESISTANCE OF 47,000 OHMS.
   - E. AVERAGE USEFUL LIFE: 25,000 HOURS WHEN OPERATED ON ALTERNATING CURRENT WITHIN THE LIMITS SPECIFIED HEREIN.
   - F. CONSTRUCTION: BULB SHALL BE TRANSPARENT GLASS, AND BASE SHALL BE OF THE MINIATURE BAYONET TYPE.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 0271 DATE 7/24/63





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Reunier DATE 19 JUNE 63
CHECKED J. Ruggein / H. Maynard 21 June 63
APPROVAL C. Sperling 7/18/63
APPROVAL [illegible] 7/18/63
APPROVAL C.P. Murphy 7/18/63
NASA APPROVAL [illegible] 7/24/63
MIT APPROVAL [illegible] 24 July 63
MIT APPROVAL Dennis [illegible] 7/24/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LAMP, GLOW

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006869

SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006869

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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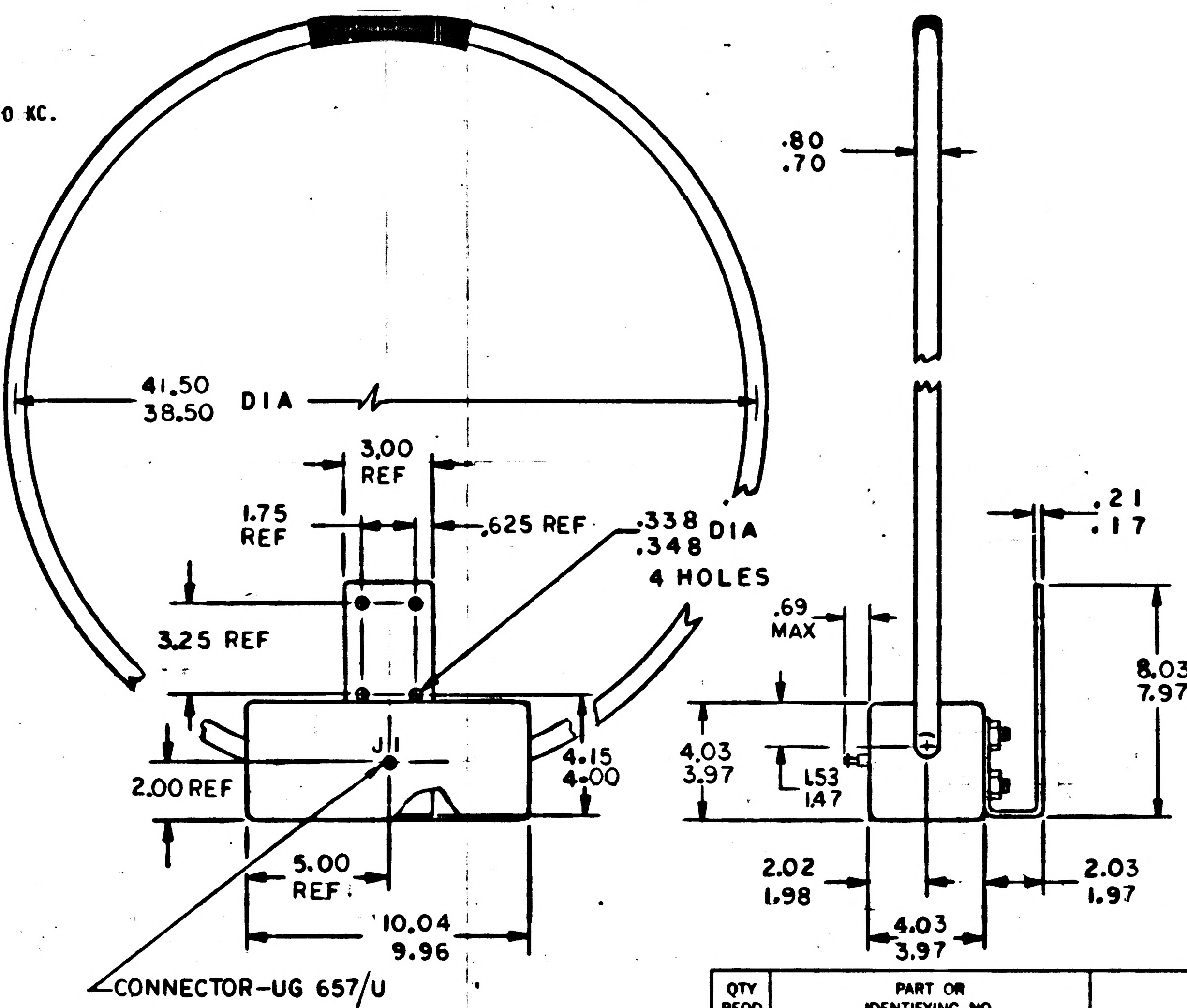
ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 02384		
A	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17890 DR H. Wong CHK [illegible] APPD H. Maynard	15 May 65	[illegible]

REQUIREMENTS:

1. GENERAL:
   - A. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND MODEL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) DC RESISTANCE: 8 OHMS PLUS OR MINUS 10 PERCENT.
     - (2) INDUCTANCE: 2.7 MILLIHENRIES PLUS OR MINUS 10 PERCENT MEASURED AT 1 KC.
     - (3) RESONANT FREQUENCY: 95 KILOCYCLES PLUS OR MINUS 10 KC.
     - (4) EFFECTIVE HEIGHT: 1 CENTIMETER AT 20 KILOCYCLES.
     - (5) Q: 2.2 PLUS OR MINUS 10% MEASURED AT 1 KC.
   - B. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS AND TOLERANCES.
   - C. MARKING PER NOTE 1 B ABOVE.
3. DESIGN:
   - A. CONSTRUCTION: UNITS SHALL BE ELECTROSTATICALLY SHIELDED AND SHALL BE WEATHER-PROOF.
   - B. ENVIRONMENTAL: UNITS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING ENVIRONMENTAL TESTS AS CONTAINED IN MIL-STD-202B:
     - (1) SALT SPRAY: METHOD 101A, TEST CONDITION B.
     - (2) MOISTURE RESISTANCE: METHOD 106A.
     - (3) SAND AND DUST: METHOD 110, TEST CONDITION B.
   - C. MATERIAL: ANTENNA LOOP, BASE AND BRACKET SHALL BE ALUMINUM ALLOY 6061-T6 WITH A CHEMICAL FILM PER MIL-C-5541, GOLD COLOR.
4. PREPARATION FOR DELIVERY PER MD 1002215.



ORIGINAL SOURCE OF SUPPLY:

AEROSPACE RESEARCH INC.
BRIGHTON, MASS.
MODEL L-1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN WSM C. Craft DATE 3 May 63
CHECKED J. Ryan H. Maynard 11 June 63
APPROVAL [illegible] 7/25/63
APPROVAL [illegible] 7/25/63
APPROVAL [illegible]
NASA APPROVAL [illegible] 8/1/63
MIT APPROVAL George J. Nelson 8/7/63
MIT APPROVAL Dennis M. Scolamiero 6 Aug 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ANTENNA

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006871
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006871 B

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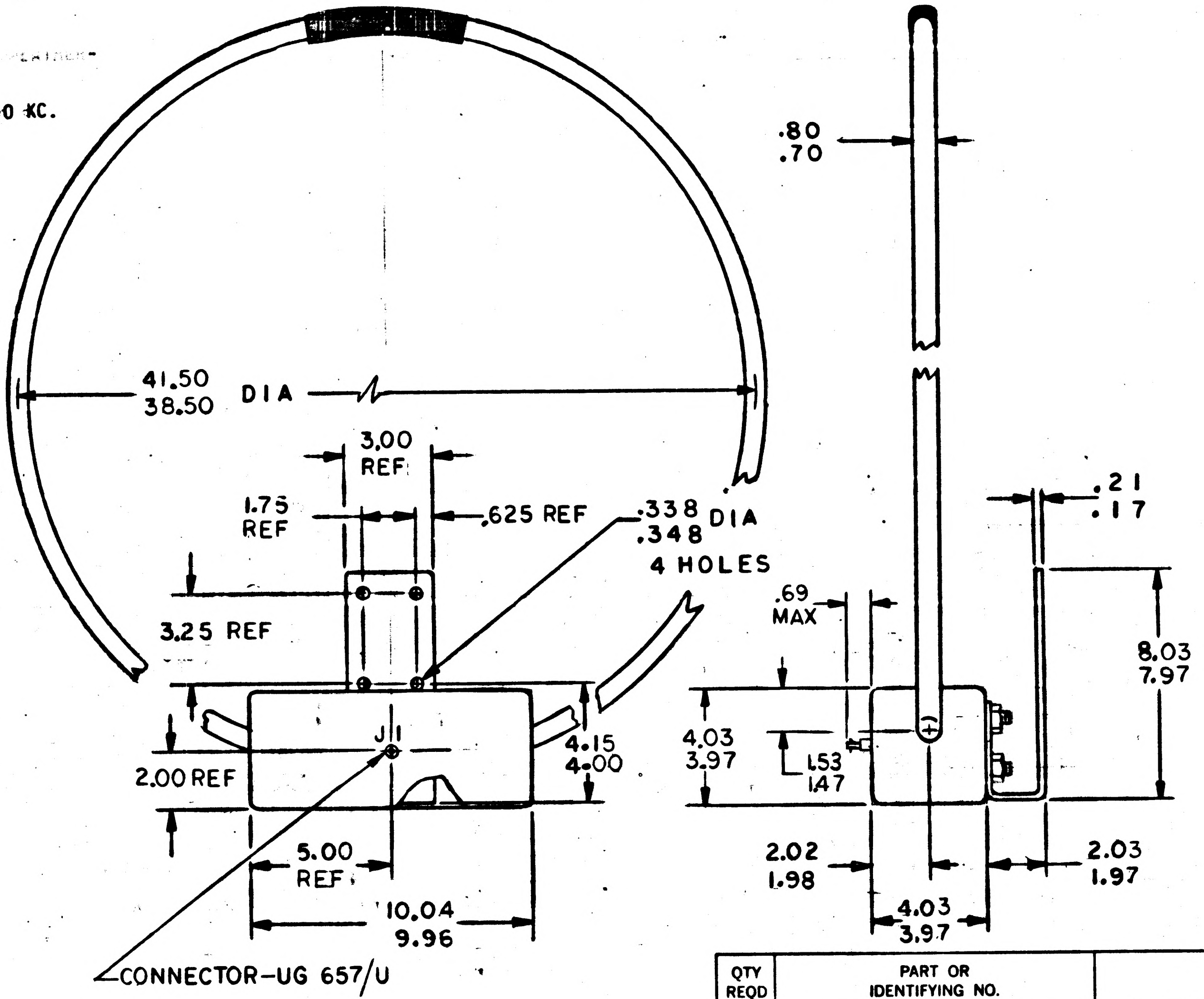
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02384 DATE 7 Aug 63

REQUIREMENTS:

1. GENERAL:
   - A. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - B. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE MANUFACTURER'S NAME AND MODEL NUMBER, NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) DC RESISTANCE: 8 OHMS PLUS OR MINUS 10 PERCENT.
     - (2) INDUCTANCE: 2.7 MILLIHENRIES PLUS OR MINUS 10 PERCENT MEASURED AT 1 KC.
     - (3) RESONANT FREQUENCY: 95 KILOCYCLES PLUS OR MINUS 10 KC.
     - (4) EFFECTIVE HEIGHT: 1 CENTIMETER AT 20 KILOCYCLES.
     - (5) Q: 2.2 PLUS OR MINUS 10% MEASURED AT 1 KC.
   - B. MECHANICAL REQUIREMENTS:
     - (1) DIMENSIONS AND TOLERANCES.
     - (2) MATERIAL: ANTENNA LOOP, BASE AND BRACKET SHALL BE ALUMINUM ALLOY 6061-T6 WITH A CHEMICAL FILM PER MIL-C-5541, GOLD COLOR. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - C. MARKING PER NOTE 1 B ABOVE.
3. DESIGN:
   - A. CONSTRUCTION: UNITS SHALL BE ELECTROSTATICALLY SHIELDED AND SHALL BE WEATHER-PROOF.
   - B. ENVIRONMENTAL: UNITS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING ENVIRONMENTAL TESTS AS CONTAINED IN MIL-STD-202B:
     - (1) SALT SPRAY: METHOD 101A, TEST CONDITION B.
     - (2) MOISTURE RESISTANCE: METHOD 106A.
     - (3) SAND AND DUST: METHOD 110, TEST CONDITION B.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND [illegible] FOR THIS DRAWING.

ORIGINAL SOURCE OF SUPPLY:

AEROSPACE RESEARCH INC.
BRIGHTON, MASS.
MODEL L-1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Wm C. Craig DATE 13 May 63
CHECKED J. Ryan 11 June 63
APPROVAL 7/25/63
APPROVAL 7/25/63
APPROVAL 7/25/63
NASA APPROVAL 8/7/63
MIT APPROVAL George J Nelson 8/7/63
MIT APPROVAL Dennis M. Scolamiero 6 Aug 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ANTENNA

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006871
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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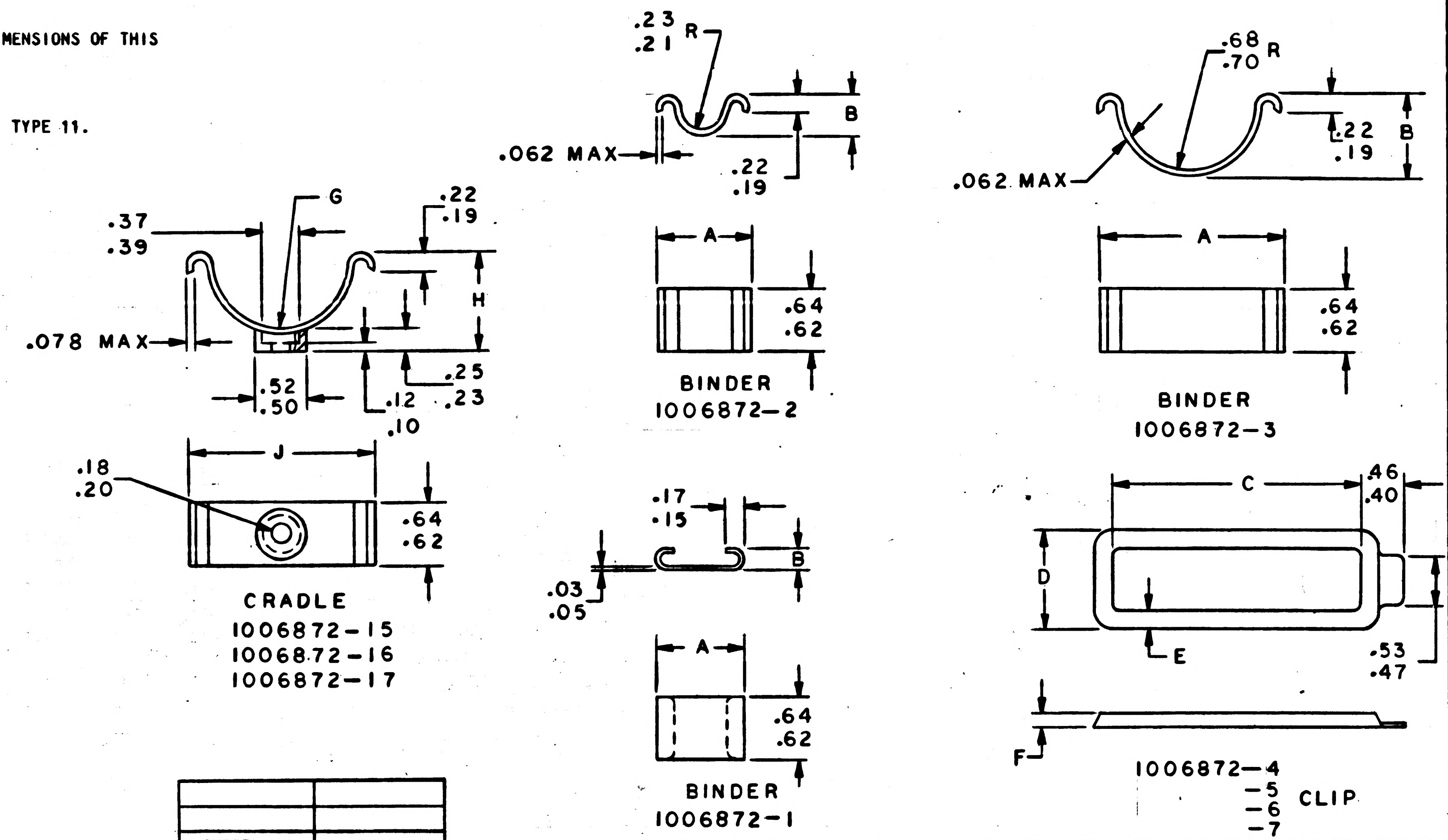
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01939
DATE 10 July 63

REQUIREMENTS:

1. GENERAL:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-M-20693, TYPE 11 WITH THE FOLLOWING EXCEPTION:
     SPECIFIC GRAVITY: 1.14 TO 1.16
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.
   - C. PACKAGE MARKING: PER MIL-STD-129 TO INCLUDE MANUFACTURER'S PART NUMBER OR SYMBOL, NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A. UNIT DIMENSIONS SHALL CONFORM TO THE SPECIFIED DIMENSIONS OF THIS DRAWING AND TABLE I.
3. DESIGN:
   - A. CONSTRUCTION: NYLON (ZYTEL 105) PER MIL-M-20693, TYPE 11.



BINDER
1006872-2

BINDER
1006872-3

CRADLE
1006872-15
1006872-16
1006872-17

BINDER
1006872-1

1006872-4
-5
-6
-7
CLIP

SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE
CHECKED
APPROVAL C Sperling 6/26/63
APPROVAL 6/26/63
APPROVAL
NASA APPROVAL Jack Basmand
MIT APPROVAL 7/1/63
MIT APPROVAL 8 Jul '63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CLAMP, LOOP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006872
SCALE NONE | WT | SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

TABLE I

DASH NO.	DIAMETER OF CABLE FORM	DIMENSIONS									ASSEMBLIES 1006872 DASH NUMBERS		
		BINDER		CLIP				CRADLE			BINDER	CLIP	CRADLE
		A	B	C	D	E	F	G	H	J			
-1		.88 .90	.18 .20										
-2		.93 .95	.38 .40										
-3		1.87 1.89	.81 .83										
-4				.46 .53	.90 .97	.14 .19	.08 .12						
-5				.97 1.03	.97 1.03	.17 .22	.09 .14						
-6				1.72 1.78	.97 1.03	.17 .22	.12 .16						
-7				2.53 2.59	.97 1.03	.17 .22	.12 .16						
-8	1/4" TO 5/8"										-1	-4	
-9	1/2" TO 11/16"										-1	-6	
-10	11/16" TO 15/16"										-2	-5	
-11	15/16" TO 1-1/16"										-2	-6	
-12	1" TO 1-1/4"										-3	-5	
-13	1-1/4" TO 1-1/2"										-3	-6	
-14	1-1/2" TO 2"										-3	-7	
-15								.21 .23 R	.56 .58	.93 .95			
-16								.43 .45 R	.75 .77	1.37 1.39			
-17								.68 .70 R	1.00 1.02	1.87 1.89			
-18	1/4" TO 5/8"											-4	-15
-19	1/2" TO 11/16"											-5	-15
-20	11/16" TO 15/16"											-5	-16
-21	15/16" TO 1-1/16"											-6	-16
-22	1" TO 1-1/4"											-5	-17
-23	1-1/4" TO 1-1/2"											-6	-17
-24	1-1/2" TO 2"											-7	-17

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01939 **DATE** 10 July 63

1006872

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crespi DATE 19 June 63
CHECKED J. Ruggeri / H. Maynard 21 June 63
APPROVAL C. Sperling 6/26/63
APPROVAL [illegible] 6/28/63
APPROVAL [illegible] 6/24/63
NASA APPROVAL Jack Barnard
MIT APPROVAL M B Trageser 7/4/63
MIT APPROVAL D. M. [illegible] Jul 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CLAMP, LOOP

SPECIFICATION CONTROL DRAWING

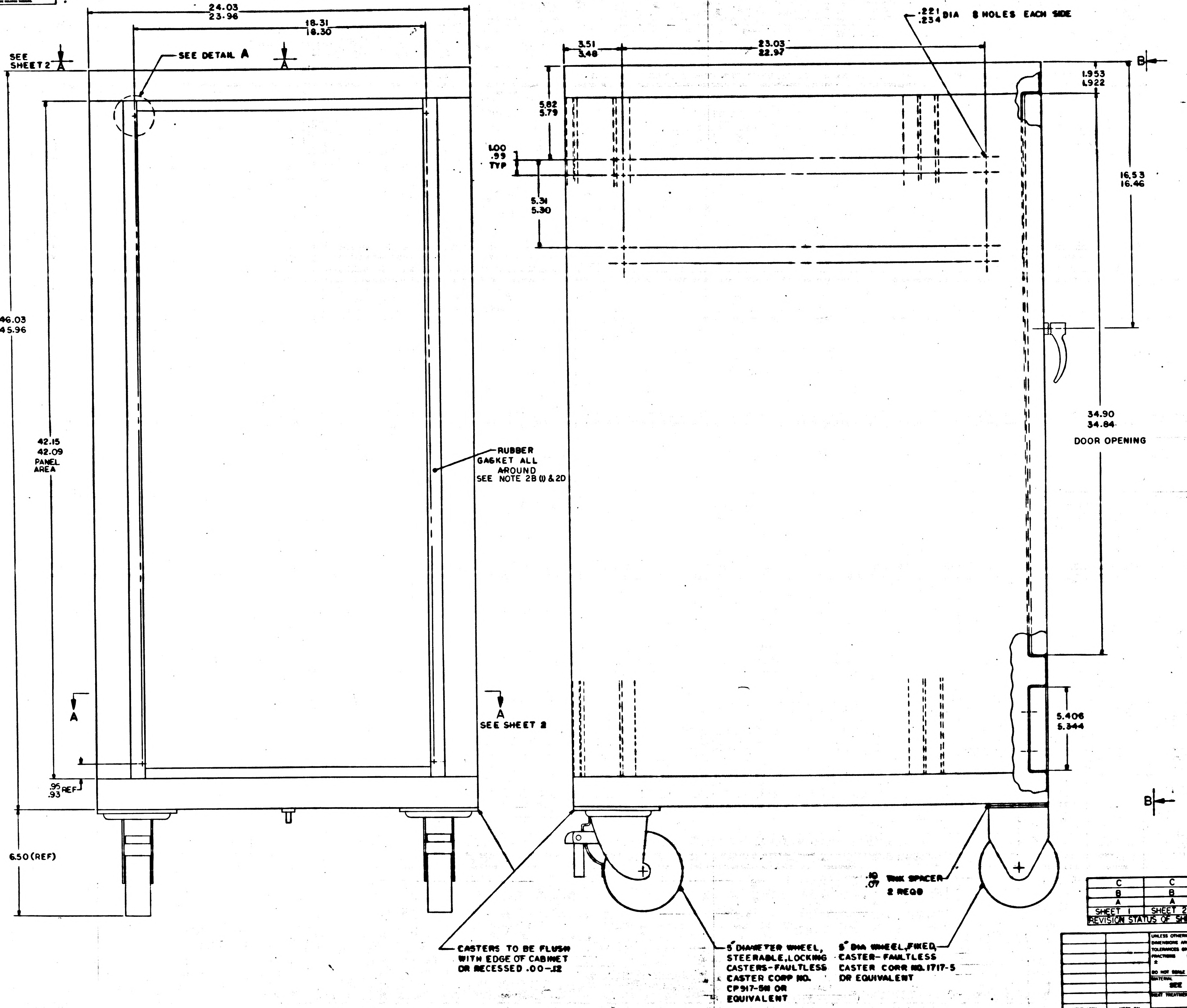
CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006872
SCALE NONE
WT
SHEET 2 OF 2

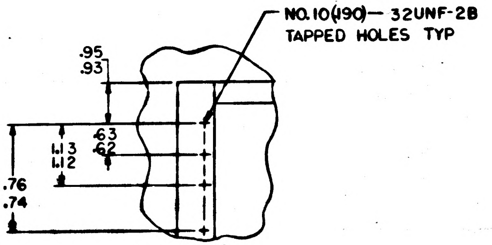
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	DESCRIPTION	DATE	APPROVED
REVISIONS			
-			
A	CLASS II CHANGE PER RD-R5320 DR Ray Wheeler CHK J Ruggeri	7/5/63	
B	CLASS II CHANGE PER RD R5506 DR R Wheeler CHK J Ruggeri APPD		
C	CHANGED PER TDRR NO. 08564 DR. Ken Beall CHK APPD		K B

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01752 DATE 26 Jun 63


24.03
23.96
18.31
18.30
SEE SHEET 2 A
SEE DETAIL A
A
46.03
45.96
42.15
42.09
PANEL AREA
RUBBER GASKET ALL AROUND SEE NOTE 2B (1) & 2D
A
A
SEE SHEET 2
.95
.93 REF
6.50 (REF)
3.51
3.48
23.03
22.97
.221
.234 DIA 8 HOLES EACH SIDE
B
5.82
5.79
1.00
.99
TYP
5.31
5.30
1.953
1.922
16.53
16.46
34.90
34.84
DOOR OPENING
5.406
5.344
B
.10
.07 THK SPACER 2 REQD
CASTERS TO BE FLUSH WITH EDGE OF CABINET OR RECESSED .00-.12
5" DIAMETER WHEEL, STEERABLE, LOCKING CASTERS-FAULTLESS CASTER CORP NO. CP917-5H OR EQUIVALENT
5" DIA WHEEL, FIXED, CASTER-FAULTLESS CASTER CORP NO. 1717-5 OR EQUIVALENT


NO.10(.190)-32UNF-2B TAPPED HOLES TYP
.95
.93
.63
.62
1.13
1.12
1.76
1.74

DETAIL A
TYP FRONT AND REAR
(ANGLE)

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: EACH UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED ON THE INSIDE OF THE REAR DOOR WITH THE MANUFACTURERS NAME AND/OR SYMBOL, PART NUMBER, PLUS THE NASA DRAWING NUMBER AND REVISION LETTER.
2. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: 16 GAGE MINIMUM THICKNESS COMMERCIAL QUALITY COLD ROLLED STEEL SHEET AND STRIP THROUGHOUT.
   - B. FINISH:
     - (1). PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915, TYPE I, ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.
     - (2). PAINT: 2 COATS TT-E-529 SEMIGLOSS ENAMEL, CLASS B. COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).
   - C. FASTENING OF MEMBERS: WELDED THROUGHOUT.
   - D. RUBBER GASKETING: 3/16 THICK RUBBER COMPRESSIBLE TO 1/8 WITHOUT A PERMANENT SET.

C	C
B	B
A	A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

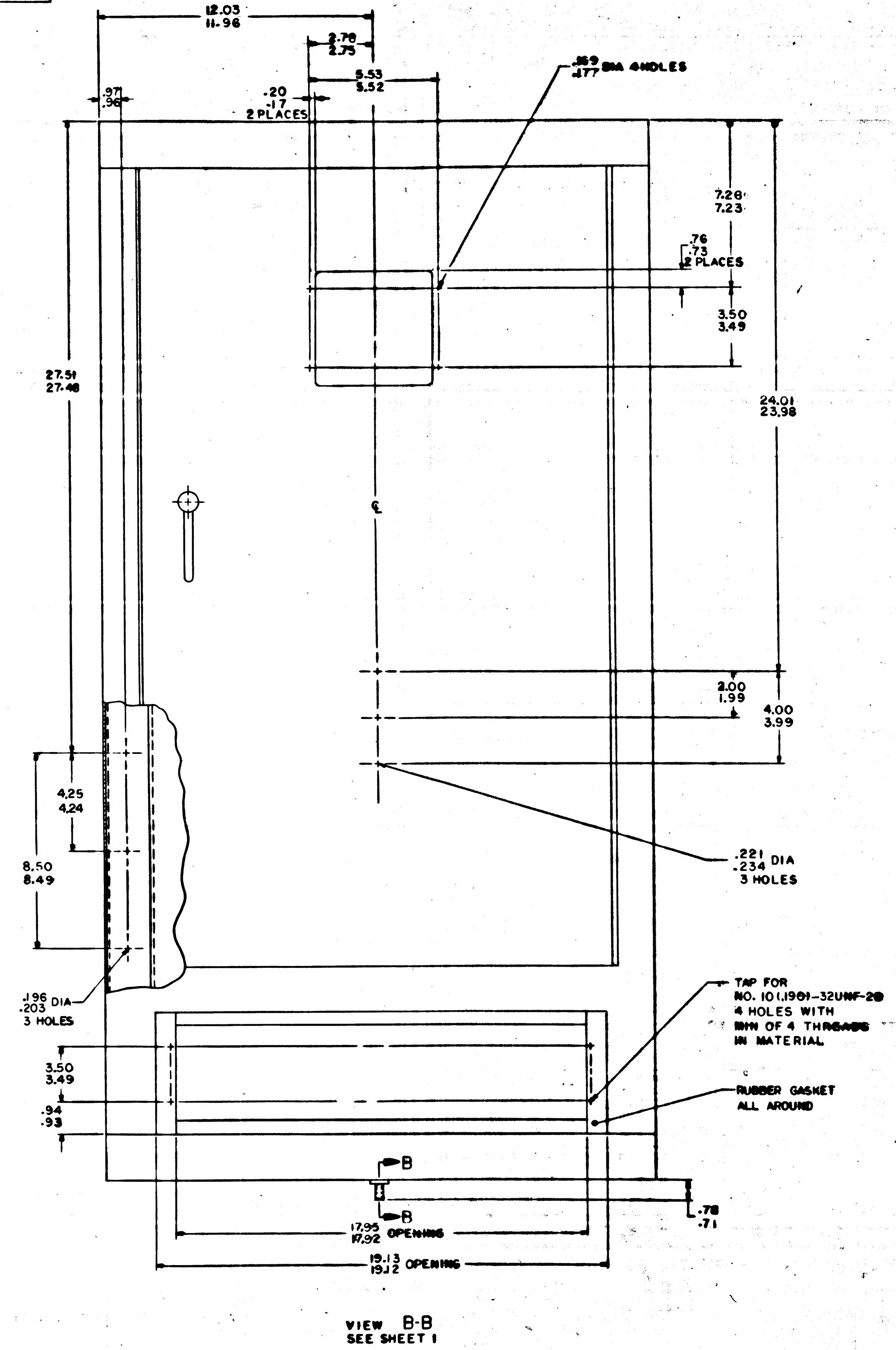
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN U.G. Cappuccio DATE 14 may 63
CHECKED R Driscoll 7 June 63
APPROVAL 6/17/63
APPROVAL
APPROVAL
NASA APPROVAL 6-26-63
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT, MOBILE
SPECIFICATION CONTROL DRAWING

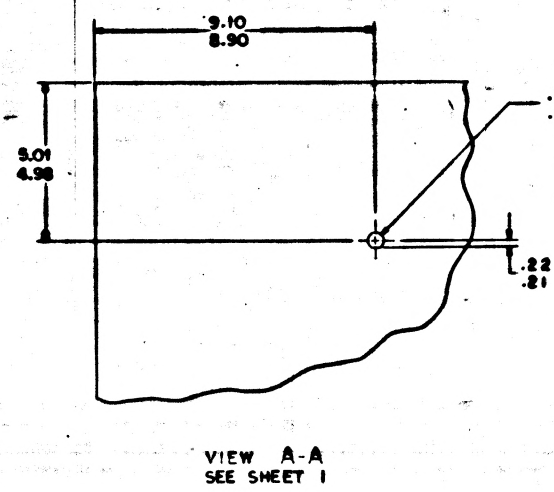
CODE IDENT NO. | SIZE J | NASA DRAWING NO. 1006875
SCALE NONE | WT | SHEET 1 OF 2

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5320 DR Gary Wheeler CHK J. Ruggen APPD	7/4/63	
B	CLASS II CHANGE PER RD-R5506 DR R Wheeler CHK J. Ruggen APPD H. Maynard		
C	CHANGED PER TDRR NO. 08564 DR Ken Bull CHK APPD H. Maynard	4/1/67	



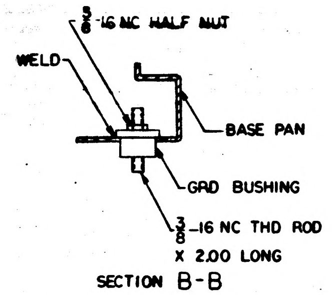
12.03
11.96
2.78
2.75
5.53
5.52
.189
.177 DIA 4 HOLES
.97
.96
.20
.17
2 PLACES
7.26
7.23
.76
.73
2 PLACES
3.50
3.49
27.51
27.48
24.01
23.98
℄
2.00
1.99
4.00
3.99
4.25
4.24
8.50
8.49
.221
.234 DIA
3 HOLES
.196
.203 DIA
3 HOLES
TAP FOR
NO. 10 (.190)-32UNF-2B
4 HOLES WITH
MIN OF 4 THREADS
IN MATERIAL
3.50
3.49
.94
.93
RUBBER GASKET
ALL AROUND
B
B
.78
.71
17.95
17.92 OPENING
19.13
19.12 OPENING

VIEW B-B
SEE SHEET 1



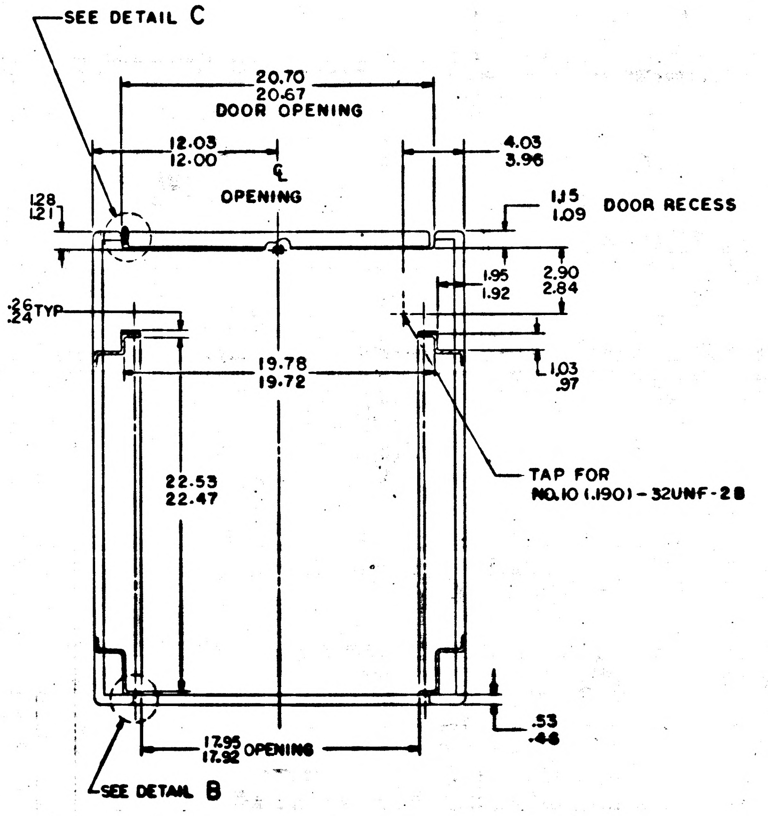
9.10
8.90
5.01
4.98
.51
.52 DIA
.22
.21

VIEW A-A
SEE SHEET 1



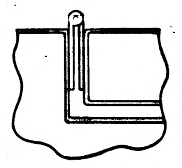
5/8-16 NC HALF NUT
WELD
BASE PAN
GRD BUSHING
3/8-16 NC THD ROD
X 2.00 LONG

SECTION B-B

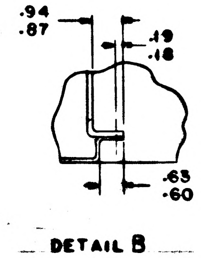


SEE DETAIL C
20.70
20.67
DOOR OPENING
12.03
12.00
℄
OPENING
4.03
3.96
.128
.121
1.15
1.09 DOOR RECESS
1.95
1.92
2.90
2.84
.26
.24 TYP
19.78
19.72
1.03
.97
22.53
22.47
TAP FOR
NO.10 (.190)-32UNF-2B
.53
.46
17.95
17.92 OPENING
SEE DETAIL B

SECTION A-A
SCALE 1/4
SEE SHEET 1



DETAIL C
SCALE 2/1



.94
.87
.19
.18
.63
.60

DETAIL B
TYP

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01752 DATE 26 June 63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

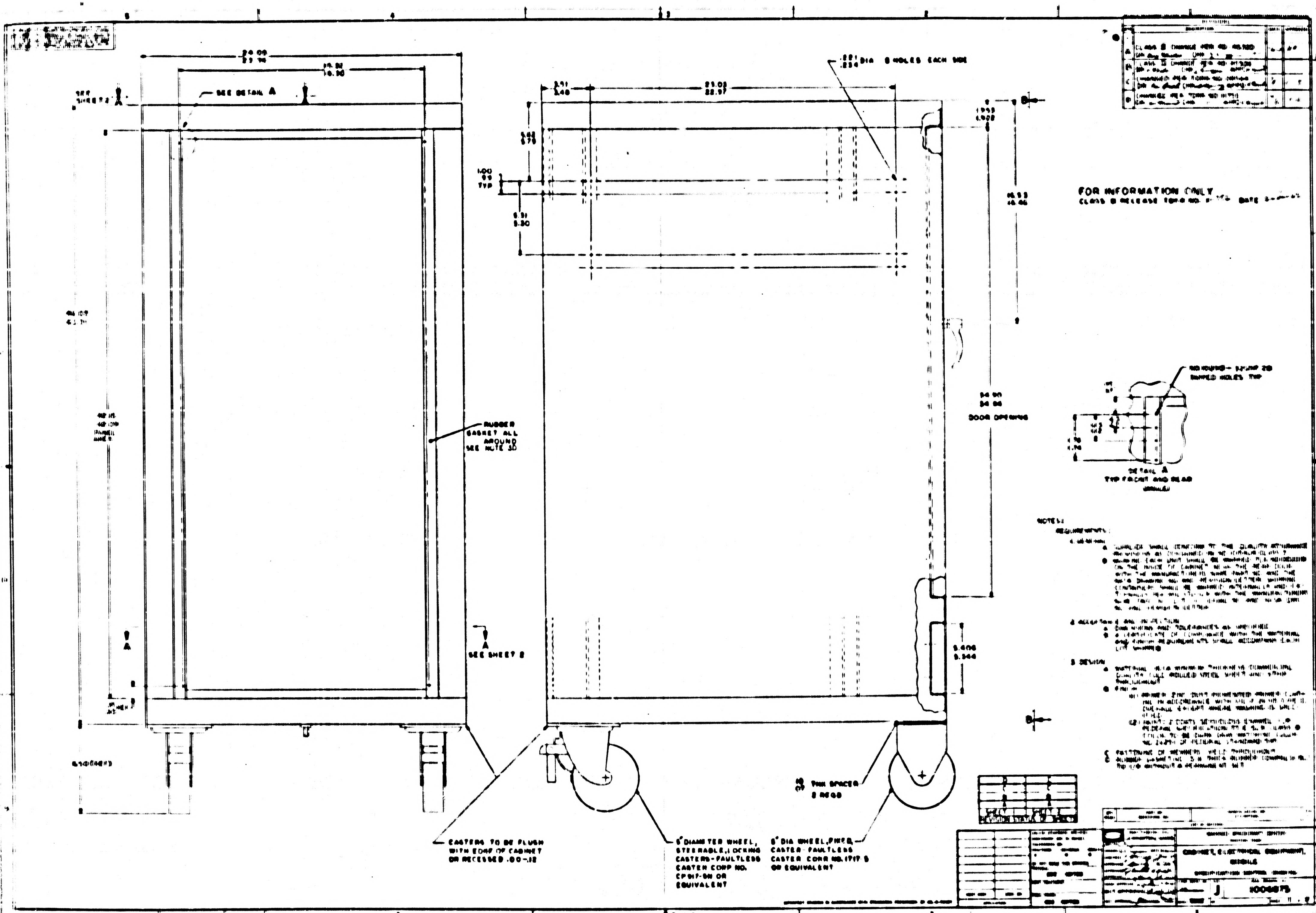
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN A.G. Coppins DATE 15 MAY 63
CHECKED 7 Jun 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT, MOBILE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE J
NASA DRAWING NO. 1006875
SCALE NONE
WT
SHEET 2 OF 2


24.00
23.96
19.92
19.90
SEE SHEET 2
SEE DETAIL A
.281 DIA 8 HOLES EACH SIDE
.234
3.51
3.49
23.03
22.97
1.953
1.922
1.00
.99
TYP
3.82
3.78
5.31
5.30
16.53
16.46
RUBBER GASKET ALL AROUND SEE NOTE 3D
34.90
34.86
DOOR OPENING
RIBBONED STRIP 2B
RIVETED HOLES TYP
DETAIL A
TYP FRONT AND REAR
SEE SHEET 2
5.406
5.344
B
CASTERS TO BE FLUSH WITH EDGE OF CABINET OR RECESSED .00-.12
5" DIAMETER WHEEL, STEERABLE, LOCKING CASTERS-FAULTLESS CASTER CORP NO. CP917-5N OR EQUIVALENT
5" DIA WHEEL, FIXED, CASTER-FAULTLESS CASTER CORP NO. 1717 5 OR EQUIVALENT
.10 .07 THK SPACER 2 REQD
NOTES:
REQUIREMENTS
DESIGN
REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CABINET, ELECTRONIC EQUIPMENT, MOBILE

SPECIFICATION CONTROL DRAWING

J

1006875

NOTICE - WHEN [illegible] MENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR [illegible] OSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERN[illegible] OCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY [illegible] RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT [illegible] GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SU[illegible] SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE RE[illegible] IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE [illegible] R ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGH[illegible] RMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVEN[illegible] T MAY IN ANY WAY BE RELATED THERETO.

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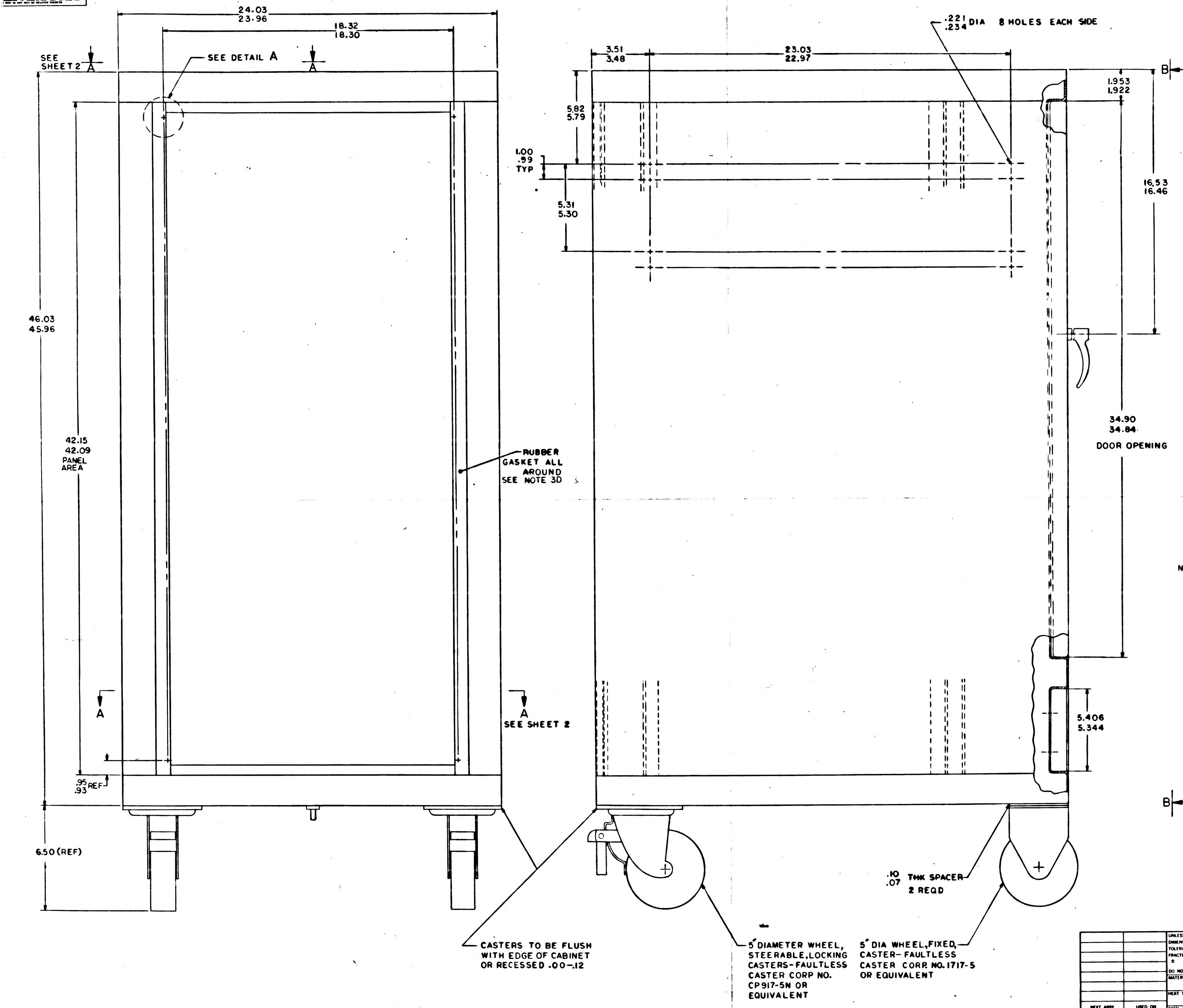
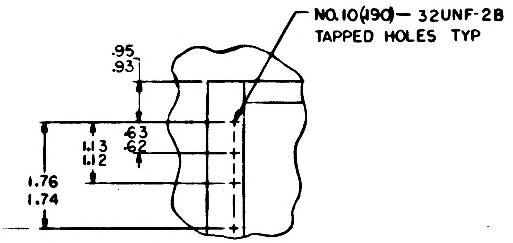
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASED PER TDRR 01752		
A	CLASS II CHANGE PER RD-R5320 DR Ray Wheeler CHK J Ruggeri	-16-63	
B	CLASS II CHANGE PER RD R5506 DR R Wheeler CHK J Ruggeri APPD Maynard		
C	CHANGED PER TDRR NO. 08564 DR. Ken Buell CHK Wolfkowitz APPD Maynard		
D	CHANGED PER TDRR NO. 11755 DR [illegible] CHK [illegible] APPD Maynard		
E	UPDATE TO CLASS A WITH CHANGE PER TDRR NO. 17234 DR [illegible] CHK Wolfkowitz APPD Mamaro	2 APR 65	


24.03
23.96
18.32
18.30
SEE SHEET 2
A
SEE DETAIL A
A
46.03
45.96
42.15
42.09
PANEL AREA
RUBBER GASKET ALL AROUND SEE NOTE 3D
A
A
SEE SHEET 2
.95
.93 REF
6.50 (REF)
CASTERS TO BE FLUSH WITH EDGE OF CABINET OR RECESSED .00-.12
3.51
3.48
23.03
22.97
.221
.234 DIA 8 HOLES EACH SIDE
5.82
5.79
1.00
.99
TYP
5.31
5.30
1.953
1.922
B
16.53
16.46
34.90
34.84
DOOR OPENING
5.406
5.344
B
.10
.07 THK SPACER 2 REQD
5" DIAMETER WHEEL, STEERABLE, LOCKING CASTERS-FAULTLESS CASTER CORP NO. CP917-5N OR EQUIVALENT
5" DIA WHEEL, FIXED, CASTER-FAULTLESS CASTER CORP. NO. 1717-5 OR EQUIVALENT


NO.10(.190)-32UNF-2B TAPPED HOLES TYP
.95
.93
.63
.62
1.13
1.12
1.76
1.74

DETAIL A
TYP FRONT AND REAR
(ANGLE)

NOTES:

REQUIREMENTS:

1. GENERAL:
   - A. SUPPLIER SHALL CONFORM TO MIL-Q-9858 PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3.
   - B. MARKING: EACH UNIT SHALL BE MARKED PER ND1002019 ON THE INSIDE OF CABINET NEAR THE REAR DOOR WITH THE MANUFACTURERS NAME, PART NO. AND THE NASA DRAWING NO. AND REVISION LETTER. SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY PER MIL-STD-129 WITH THE MANUFACTURERS NAME, PART NO., LOT OR SERIAL NO AND NASA DWG NO. AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION:
   - A DIMENSIONS AND TOLERANCES AS SPECIFIED.
   - B. A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH LOT SHIPPED.
3. DESIGN:
   - A MATERIAL: 16 GA MINIMUM THICKNESS COMMERCIAL QUALITY COLD ROLLED STEEL SHEET AND STRIP THROUGHOUT.
   - B. FINISH:
     - (1) PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915, TYPE I, OVERALL EXCEPT WHERE MASKING IS SPECIFIED.
     - (2) PAINT: 2 COATS SEMI-GLOSS ENAMEL PER FEDERAL SPECIFICATION TT-E-529, CLASS B. COLOR TO BE DARK GRAY MATCHING COLOR NO. 26251 OF FEDERAL STANDARD 595
   - C. FASTENING OF MEMBERS: WELD THROUGHOUT
   - D. RUBBER GASKETING: 3/16 THICK RUBBER COMPRESSIBLE TO 1/8 WITHOUT A PERMANENT SET.

1006875 E

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO
DRAWN L.G. Capuano DATE 14 March 63
CHECKED R. Driscoll 7 June 63
APPROVAL C. Spaulding 6/17/63
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 6-26-63
MIT APPROVAL [illegible] 24 June 63
MIT APPROVAL [illegible] 6/25/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT, MOBILE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO
SIZE J
NASA DRAWING NO 1006875
SCALE NONE
WT
SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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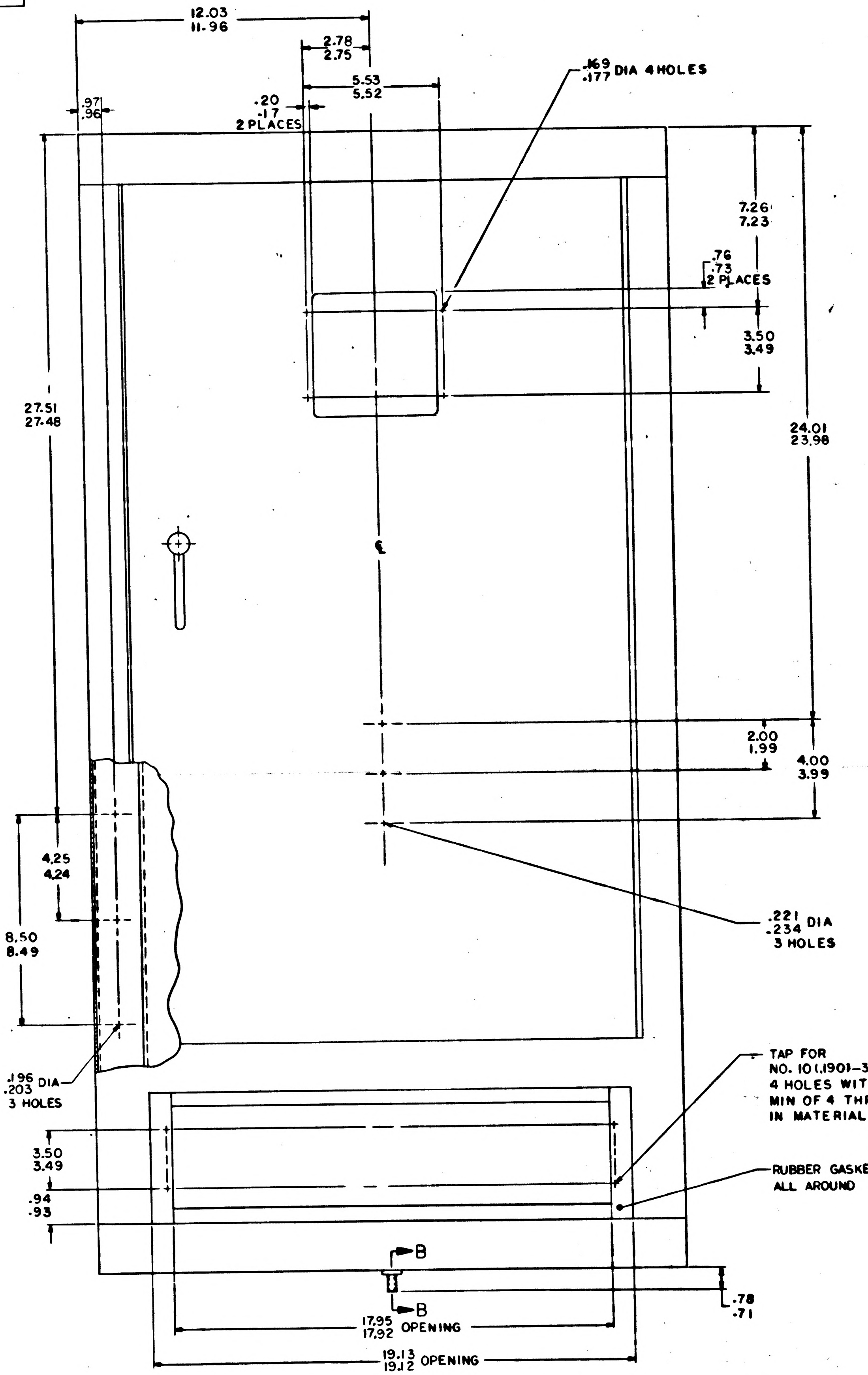
ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

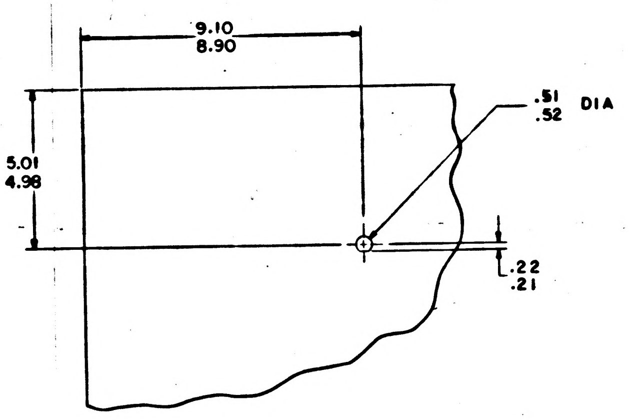
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASED PER TDRR 01752		
A	CLASS II CHANGE PER RD-R5320 DR Ray Wheeler CHK J. Ruggen APPD	1/6/63	
B	CLASS II CHANGE PER RD-R5506 DR R. Wheeler CHK J. Ruggen APPD		
C	CHANGED PER TDRR NO. 08564 DR Ken Budd CHK APPD	4/1/64	KGB
E	UPGRADE TO CLASS A WITH CHANGE PER TDRR NO. 17234 DR CHK APPD Marinaro	2 APR 65	KEB



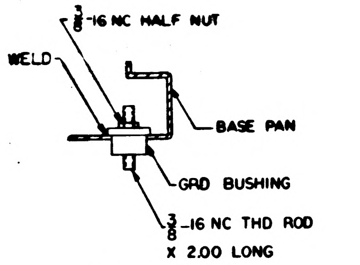
12.03
11.96
2.78
2.75
5.53
5.52
.169
.177 DIA 4 HOLES
.97
.96
.20
.17
2 PLACES
7.26
7.23
.76
.73
2 PLACES
3.50
3.49
27.51
27.48
24.01
23.98
℄
2.00
1.99
4.00
3.99
4.25
4.24
8.50
8.49
.221
.234 DIA
3 HOLES
.196
.203 DIA
3 HOLES
TAP FOR NO. 10 (.190)-32UNF-2B 4 HOLES WITH MIN OF 4 THREADS IN MATERIAL
3.50
3.49
.94
.93
RUBBER GASKET ALL AROUND
B
B
.78
.71
17.95
17.92 OPENING
19.13
19.12 OPENING

VIEW B-B
SEE SHEET 1



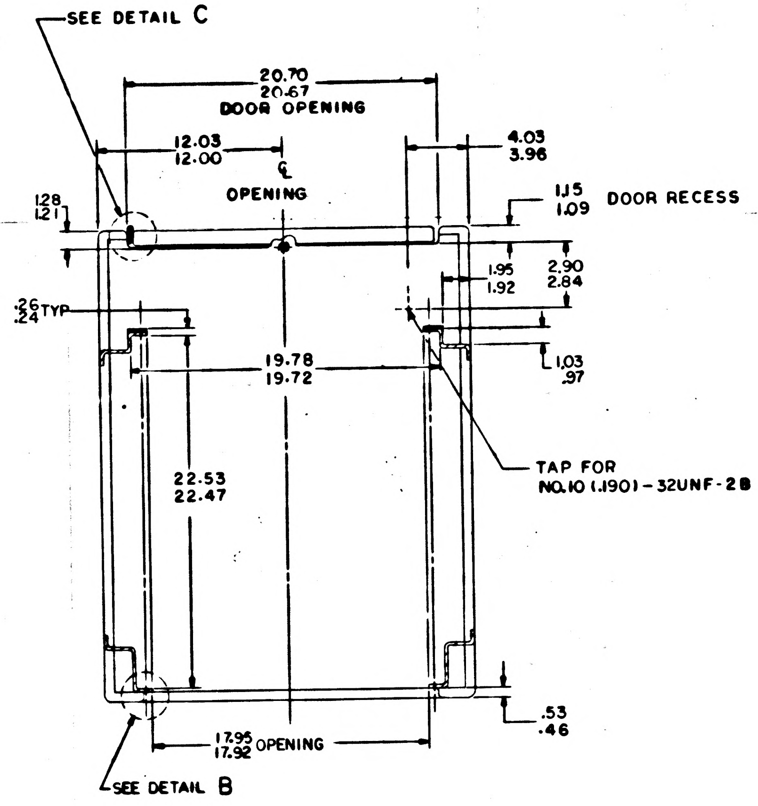
9.10
8.90
5.01
4.98
.51
.52 DIA
.22
.21

VIEW A-A
SEE SHEET 1



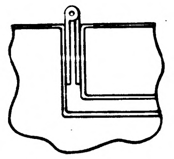
3/8-16 NC HALF NUT
WELD
BASE PAN
GRD BUSHING
3/8-16 NC THD ROD X 2.00 LONG

SECTION B-B

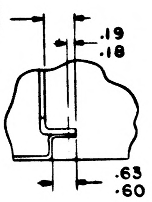


SEE DETAIL C
20.70
20.67
DOOR OPENING
12.03
12.00
℄
OPENING
4.03
3.96
1.28
1.21
1.15
1.09 DOOR RECESS
1.95
1.92
2.90
2.84
.26
.24 TYP
19.78
19.72
1.03
.97
22.53
22.47
TAP FOR NO.10 (.190)-32UNF-2B
.53
.46
17.95
17.92 OPENING
SEE DETAIL B

SECTION A-A
SCALE 1/4
SEE SHEET 1



DETAIL C
SCALE 2/1



.94
.87
.19
.18
.63
.60

DETAIL B
TYP

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO
DRAWN A.G. Caggiano DATE 15 MAY 63
CHECKED R. Russell 7 Jun 63
APPROVAL 6/17/63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 6/7/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT, MOBILE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO
SIZE J
NASA DRAWING NO 1006875
SCALE NONE
WT
SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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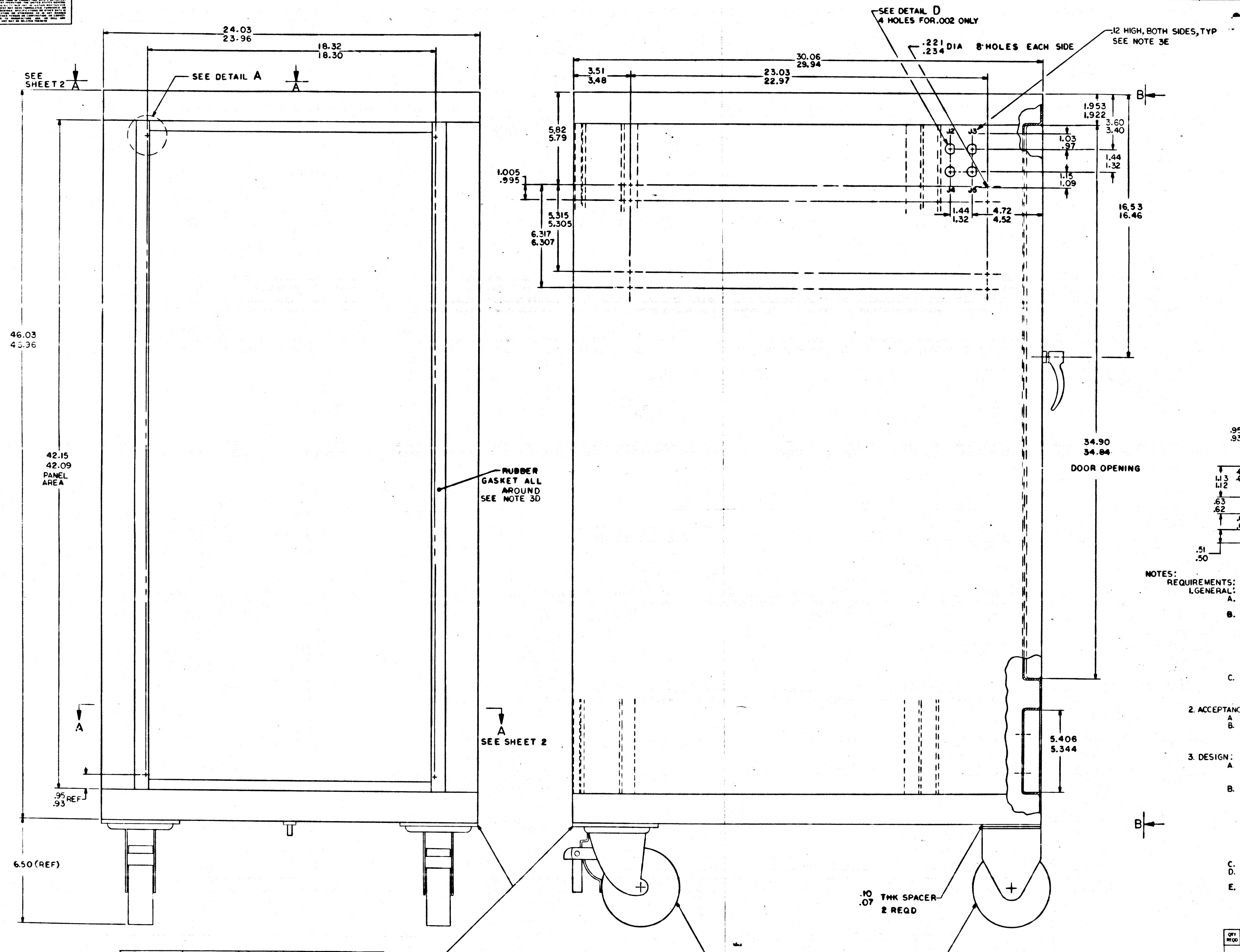
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASED PER TDRR 01752		
A	CLASS II CHANGE PER RD-R5320 DR Bay Wheeler CHK		
B	CLASS II CHANGE PER RD R5506 DR R Wheeler CHK APPD		
C	CHANGED PER TDRR NO. 08564 DR. Ken Bull CHK APPD		K B
D	CHANGED PER TDRR NO. 11755 DR CHK J J APPD		
E	UPDATE TO CLASS A WITH CHANGE PER TDRR NO. 17234 DR P. Winfield CHK APPD	2 APR 65	
F	CHANGED PER TDRR NO. 20066 DR CHK APPD		

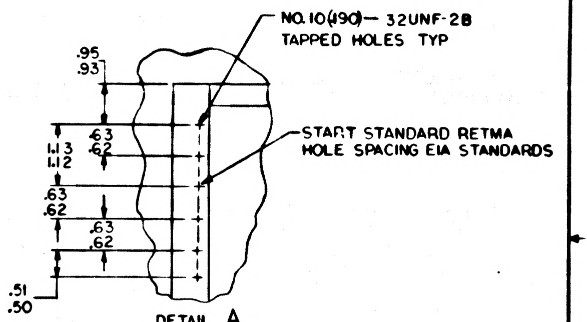


24.03
23.96
18.32
18.30
SEE SHEET 2
A
SEE DETAIL A
46.03
45.96
42.15
42.09
PANEL AREA
RUBBER GASKET ALL AROUND SEE NOTE 3D
.95
.93 REF
6.50 (REF)
A
SEE SHEET 2
SEE DETAIL D
4 HOLES FOR .002 ONLY
.221
.234 DIA 8 HOLES EACH SIDE
.12 HIGH, BOTH SIDES, TYP
SEE NOTE 3E
30.06
29.94
3.51
3.48
23.03
22.97
B
5.82
5.79
1.005
.995
5.315
5.305
6.317
6.307
J2
J3
J4
J5
1.953
1.922
3.60
3.40
1.03
.97
1.44
1.32
1.15
1.09
1.44
1.32
4.72
4.52
16.53
16.46
34.90
34.84
DOOR OPENING
5.406
5.344
B
.10
.07 THK SPACER
2 REQD

CASTERS TO BE FLUSH WITH EDGE OF CABINET OR RECESSED .00-.12

5" DIAMETER WHEEL, STEERABLE, LOCKING CASTERS-FAULTLESS CASTER CORP NO. CP917-5N OR EQUIVALENT

5" DIA WHEEL, FIXED, CASTER-FAULTLESS CASTER CORP NO. 1717-5 OR EQUIVALENT



NO. 10(.190)-32UNF-2B TAPPED HOLES TYP
START STANDARD RETMA HOLE SPACING EIA STANDARDS
.95
.93
.63
.62
1.13
1.12
.63
.62
.63
.62
.51
.50

DETAIL A
TYP FRONT AND REAR
(ANGLE)

DASH NO.	QTY HOLES (DETAIL D)	QTY HOLES (DETAIL E)
1006875-000	NONE	ONE (J1 ONLY)
1006875-001	NONE	NONE
1006875-002	FIVE (J1 2 3 4 & 5)	NONE

NOTES:
REQUIREMENTS:
1. GENERAL:
- A. SUPPLIER SHALL CONFORM TO MIL-Q-9858 PROVISIONS AS CONTAINED IN ND 1015404 CLASS 3
- B. MARKING: EACH UNIT SHALL BE MARKED PER ND 1002019 ON THE INSIDE OF CABINET NEAR THE REAR DOOR WITH THE MANUFACTURERS NAME, PART NO. AND THE NASA DRAWING NO.. SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND EXTERNALLY PER MIL-STD-129 WITH THE MANUFACTURERS NAME, PART NO., LOT OR SERIAL NO. AND NASA DWG NO. AND REVISION LETTER
- C. THE ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DWG NO. AND A -000 SUFFIX

2. ACCEPTANCE AND INSPECTION:
- A. DIMENSIONS AND TOLERANCES AS SPECIFIED.
- B. A CERTIFICATE OF COMPLIANCE WITH THE MATERIAL AND FINISH REQUIREMENTS SHALL ACCOMPANY EACH LOT SHIPPED.

3. DESIGN:
- A. MATERIAL: 16 GA MINIMUM THICKNESS COMMERCIAL QUALITY COLD ROLLED STEEL SHEET AND STRIP THROUGHOUT.
- B. FINISH:
  - (1) PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915, TYPE I, OVERALL EXCEPT WHERE MASKING IS SPECIFIED.
  - (2) PAINT: 2 COATS SEMI-GLOSS ENAMEL PER FEDERAL SPECIFICATION TT-E-529, CLASS B. COLOR TO BE DARK GRAY MATCHING COLOR NO. 26251 OF FEDERAL STANDARD 595
- C. FASTENING OF MEMBERS: WELD THROUGHOUT
- D. RUBBER GASKETING: 3/16 THICK RUBBER COMPRESSIBLE TO 1/8 WITHOUT A PERMANENT SET.
- E. MARK GOTHIC CHARACTERS AS SHOWN, AS REQUIRED, PER ND 1002019, USING BLACK MARKING INK, 1006271-0

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE
HEAT TREATMENT
FINAL FINISH: SEE NOTE

RAYTHEON CO.
LEXINGTON, MASS
CONTRACT NO
DRAWN J.G. DATE 14 MAY 63
CHECKED 7 June 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

CABINET, ELECTRICAL EQUIPMENT, MOBILE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO 49956 | SIZE J | NASA DRAWING NO 1006875
SCALE NONE | WT | SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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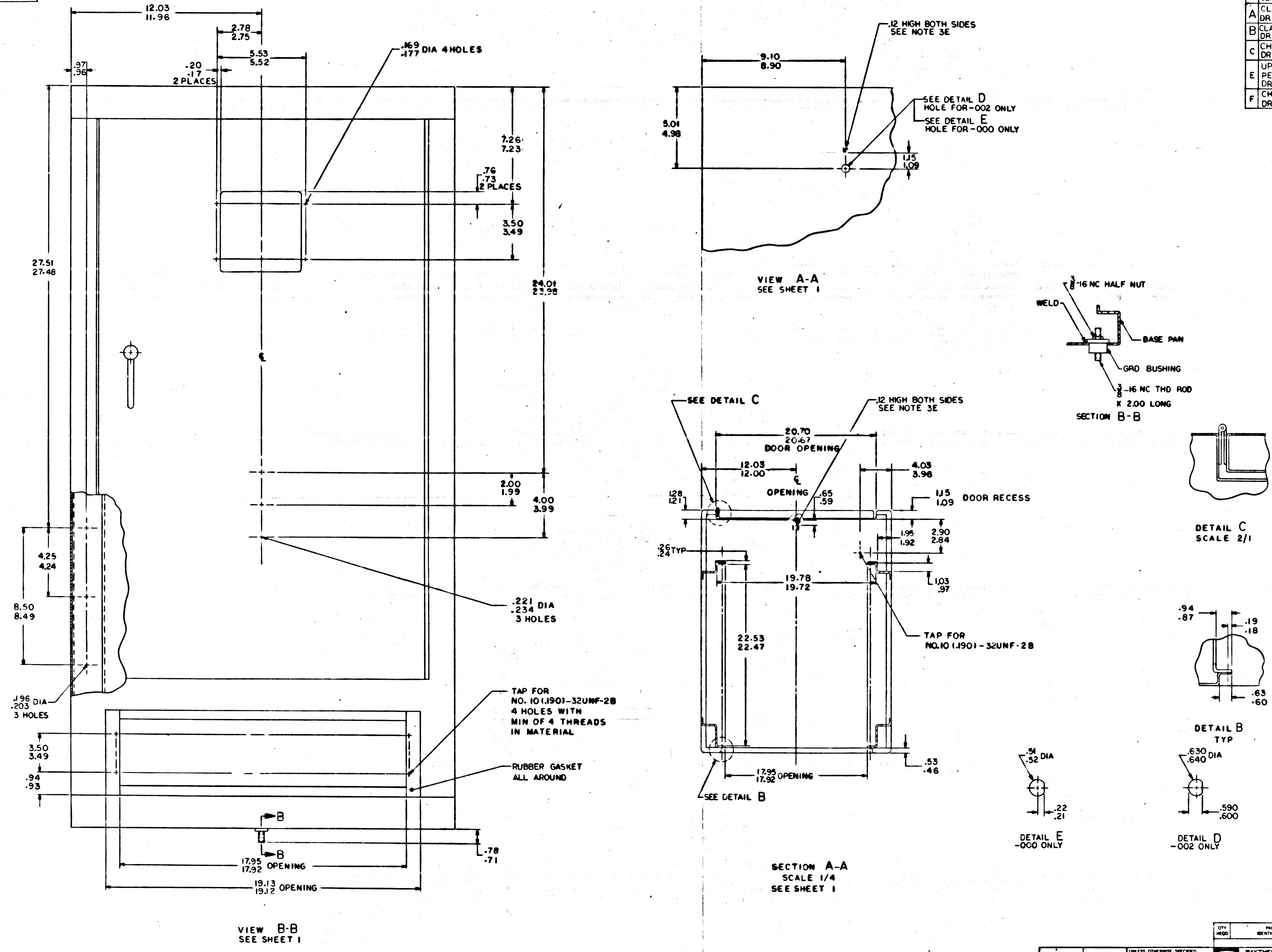
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–	CLASS B RELEASED PER TDRR 01752		
A	CLASS II CHANGE PER RD-R5320 DR Ray Wheeler CHK J Ruggen APPD	7/4/63	
B	CLASS II CHANGE PER RD-R5506 DR R Wheeler CHK J Ruggen APPD		
C	CHANGED PER TDRR NO. 08564 DR Ken Bull CHK APPD H Magnani	4/1/64	
E	UPGRADE TO CLASS A WITH CHANGE PER TDRR NO. 17234 DR CHK APPD Marinaro	2 APR 65	
F	CHANGED PER TDRR NO. 20066 DR C. Grosi CHK APPD H Magnani		



12.03
11.96
2.78
2.75
5.53
5.52
.169
.177 DIA 4 HOLES
.97
.96
.20
.17
2 PLACES
7.26
7.23
.76
.73
2 PLACES
3.50
3.49
27.51
27.48
24.01
23.98
℄
2.00
1.99
4.00
3.99
4.25
4.24
8.50
8.49
.221
.234 DIA
3 HOLES
.196
.203 DIA
3 HOLES
TAP FOR
NO. 10 (.190)-32UNF-2B
4 HOLES WITH
MIN OF 4 THREADS
IN MATERIAL
RUBBER GASKET
ALL AROUND
3.50
3.49
.94
.93
B
B
.78
.71
17.95
17.92 OPENING
19.13
19.12 OPENING
VIEW B-B
SEE SHEET I
.12 HIGH BOTH SIDES
SEE NOTE 3E
9.10
8.90
5.01
4.98
SEE DETAIL D
HOLE FOR-002 ONLY
SEE DETAIL E
HOLE FOR-000 ONLY
1.15
1.09
VIEW A-A
SEE SHEET I
SEE DETAIL C
.12 HIGH BOTH SIDES
SEE NOTE 3E
20.70
20.67
DOOR OPENING
12.03
12.00
℄
OPENING
.65
.59
4.03
3.98
1.15
1.09 DOOR RECESS
.128
.121
1.95
1.92
2.90
2.84
.26
.24 TYP
19.78
19.72
1.03
.97
22.53
22.47
TAP FOR
NO.10 (.190)-32UNF-2B
17.95
17.92 OPENING
.53
.46
SEE DETAIL B
SECTION A-A
SCALE 1/4
SEE SHEET I
3/8-16 NC HALF NUT
WELD
BASE PAN
GRD BUSHING
3/8-16 NC THD ROD
X 2.00 LONG
SECTION B-B
DETAIL C
SCALE 2/1
.94
.87
.19
.18
.63
.60
DETAIL B
TYP
.51
.52 DIA
.22
.21
DETAIL E
-000 ONLY
.630
.640 DIA
.590
.600
DETAIL D
-002 ONLY

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO

DRAWN A.G. Caggiano DATE 15 MAY 63
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

CABINET, ELECTRICAL EQUIPMENT, MOBILE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO	SIZE	NASA DRAWING NO
49956	J	1006875
SCALE NONE	WT	SHEET 2 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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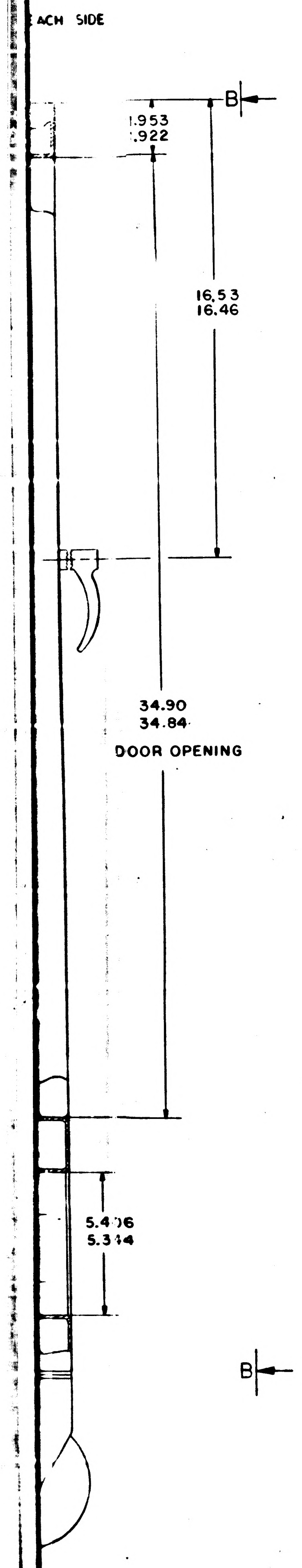
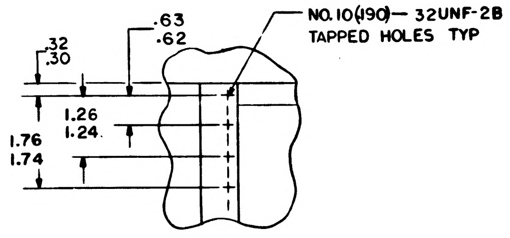
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01752 DATE 26 Jun 63



DETAIL A
TYP FRONT AND REAR

NOTES:

1. GENERAL REQUIREMENTS:
   - A. MARKING: EACH UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED ON THE INSIDE OF THE REAR DOOR WITH THE MANUFACTURERS NAME AND/OR SYMBOL, PART NUMBER, PLUS THE NASA DRAWING NUMBER AND REVISION LETTER.
2. CONSTRUCTION REQUIREMENTS:
   - A. MATERIAL: 16 GAGE MINIMUM THICKNESS COMMERCIAL QUALITY COLD ROLLED STEEL SHEET AND STRIP THROUGHOUT.
   - B. FINISH:
     - (1). PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915, TYPE I, ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.
     - (2). PAINT: 2 COATS TT-E-529 SEMIGLOSS ENAMEL, CLASS B. COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).
   - C. FASTENING OF MEMBERS: WELDED THROUGHOUT.
   - D. RUBBER GASKETING: 3/16 THICK RUBBER COMPRESSIBLE TO 1/8 WITHOUT A PERMANENT SET.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN A.G. Cazzano DATE 14 May 63
CHECKED R Driscoll 7 June 63
APPROVAL C. Sperling 6/17/63
APPROVAL 6/12/63
APPROVAL
NASA APPROVAL 6-26-63
MIT APPROVAL 24 Jun 63
MIT APPROVAL 6/25/63

MANNED SPACECRAFT CENTER
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CABINET, ELECTRICAL EQUIPMENT, MOBILE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 63 — SIZE J — NASA DRAWING NO. 1006875
SCALE NONE — WT — SHEET 1 OF 2

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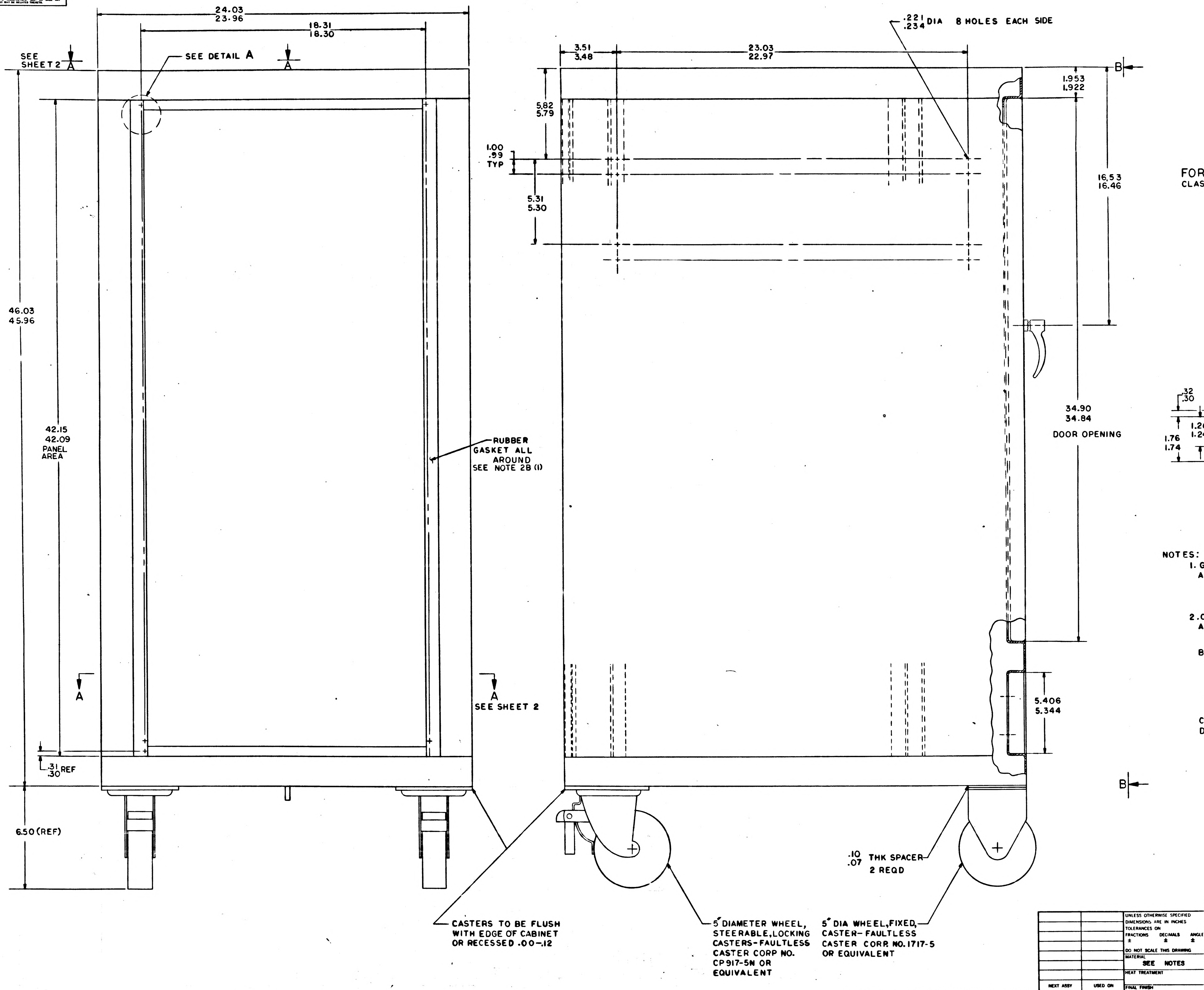
REVISIONS		
SYM	DESCRIPTION	DA

1006875

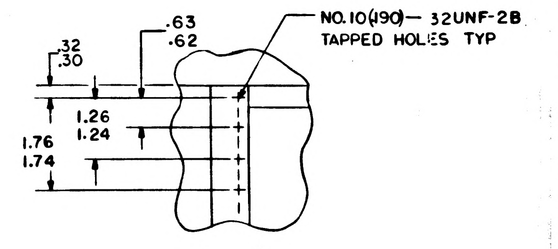

24.03
23.96
18.31
18.30
SEE SHEET 2 A
SEE DETAIL A
A
46.03
45.96
42.15
42.09
PANEL AREA
RUBBER GASKET ALL AROUND SEE NOTE 2B (1)
A
A
SEE SHEET 2
.31
.30 REF
6.50 (REF)
.221
.234 DIA 8 HOLES EACH SIDE
3.51
3.48
23.03
22.97
5.82
5.79
1.00
.99
TYP
5.31
5.30
1.953
1.922
B
16.53
16.46
34.90
34.84
DOOR OPENING
5.406
5.344
B
.10
.07 THK SPACER
2 REQD

CASTERS TO BE FLUSH WITH EDGE OF CABINET OR RECESSED .00-.12

5" DIAMETER WHEEL, STEERABLE, LOCKING CASTERS-FAULTLESS CASTER CORP NO. CP917-5N OR EQUIVALENT

5" DIA WHEEL, FIXED, CASTER-FAULTLESS CASTER CORP. NO. 1717-5 OR EQUIVALENT

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 0.752 DATE


.32
.30
.63
.62
NO.10(.190)-32UNF-2B TAPPED HOLES TYP
1.26
1.24
1.76
1.74

DETAIL A
TYP FRONT AND REAR

NOTES:

1. GENERAL REQUIREMENTS:
   A. MARKING: EACH UNIT SHALL BE PERMANENT AND LEGIBLY MARKED ON THE INSIDE OF THE REAR DOOR WITH THE MANUFACTURERS NAME AND/OR SYMBOL, PART NUMBER, PLUS THE NA DRAWING NUMBER AND REVISION LETTER.
2. CONSTRUCTION REQUIREMENTS:
   A. MATERIAL: 16 GAGE MINIMUM THICKNESS COMMERCIAL QUALITY COLD ROLLED STEEL S AND STRIP THROUGHOUT.
   B. FINISH:
      (1). PRIMER: ZINC DUST PIGMENTED PRIMER COATING IN ACCORDANCE WITH MIL-P-26915, TYPE I, ALL OVER EXCEPT WHERE MASKING IS SPECIFIED.
      (2). PAINT: 2 COATS TT-E-529 SEMIGLOSS ENAM CLASS B. COLOR TO BE DARK GRAY (NO. 26251 OF FED-STD-595).
   C. FASTENING OF MEMBERS: WELDED THROUGHO
   D. RUBBER GASKETING: 3/16 THICK RUBBER COMPRESSIBLE TO 1/8 WITHOUT A PERMANEN SET.

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION
LIST OF MATERIALS		

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	RAYTHEON CO. LEXINGTON, MASS. CONTRACT NO	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL SEE NOTES	DRAWN J.G. Cuzzone DATE 14 May 63 CHECKED R. Wincoff 7 June 63 APPROVAL C. Spading 6/7/63 APPROVAL 6/12/63 APPROVAL	CABINET, ELECTRICAL EQUIP MOBILE SPECIFICATION CONTROL DRAW
		HEAT TREATMENT	NASA APPROVAL MIT APPROVAL MIT APPROVAL	CODE IDENT NO. SIZE J NASA DRAWING NO. 100687
		FINAL FINISH		SCALE NONE WT SHEET

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INCHES
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F-1 1006875

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED

$\frac{51}{52}$ DIA

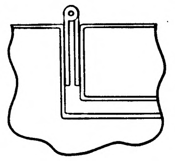
901— 32UNF-2A

E $\frac{1.03}{.97}$ DIA FARSIDE,
BE FREE OF PAINT
T

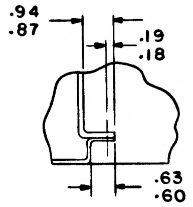
$\frac{1.15}{1.09}$ DOOR RECESS

$\frac{1.03}{.97}$

AP FOR
0.10 (.190)-32UNF-2B



DETAIL C
SCALE 2/1



DETAIL B
TYP

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01752 DATE 26 June 63

1006875

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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MATERIAL
HEAT TREATMENT
FINAL FINISH

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DRAWN A.G. Caggiano DATE 15 MAY 63
CHECKED R. Dowell 7 Jun 63
APPROVAL C. Sparling 6/17/63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL L. Gelsomini

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HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIPMENT, MOBILE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE J | NASA DRAWING NO. 1006875
SCALE NONE | WT | SHEET 2 OF 2

ML-D-70327

1006812

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F-2 1006875

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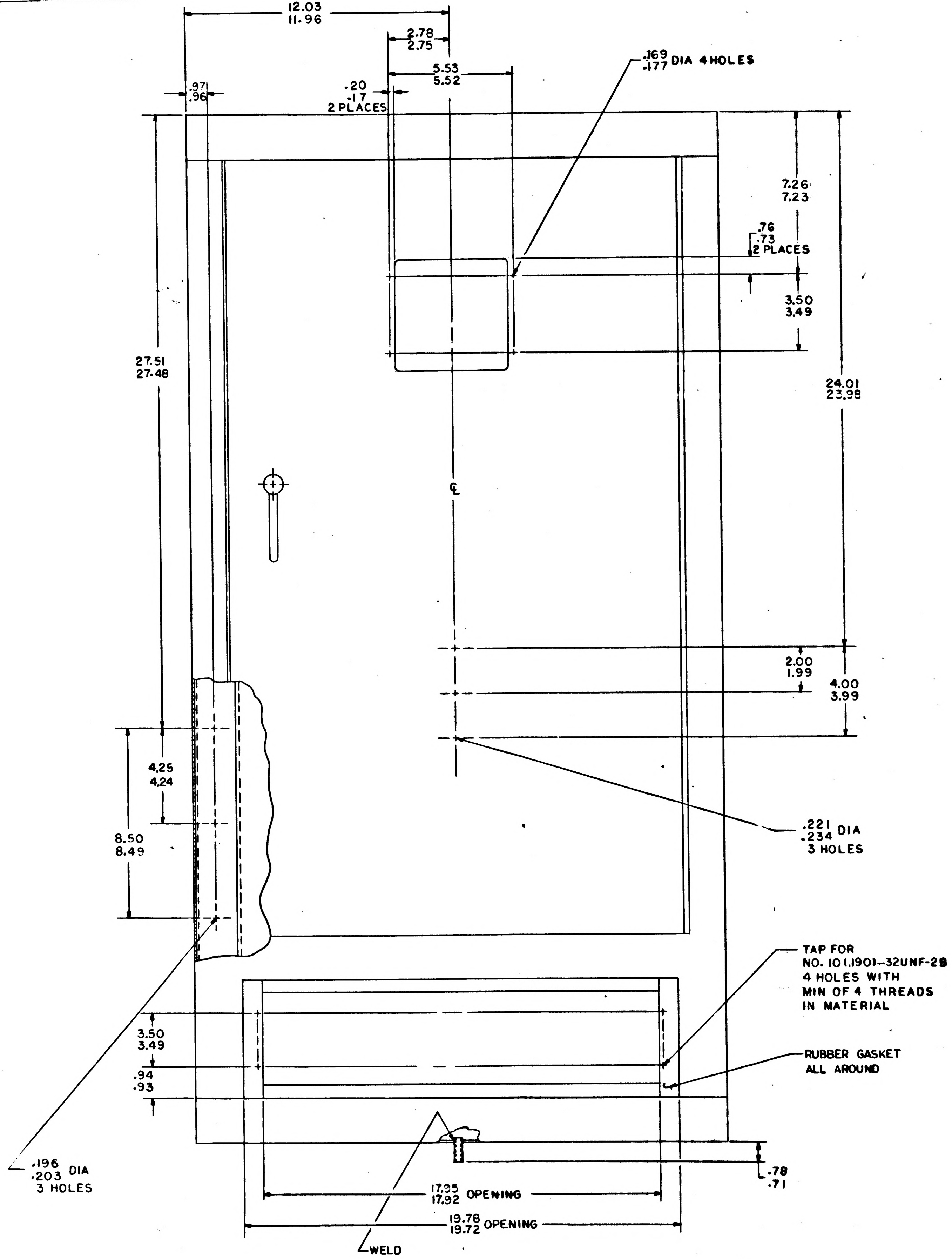
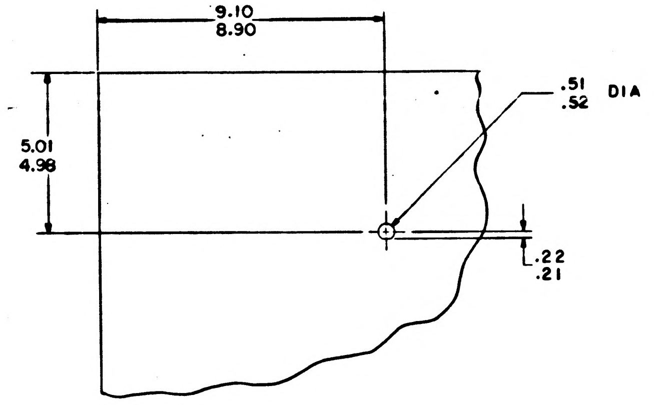
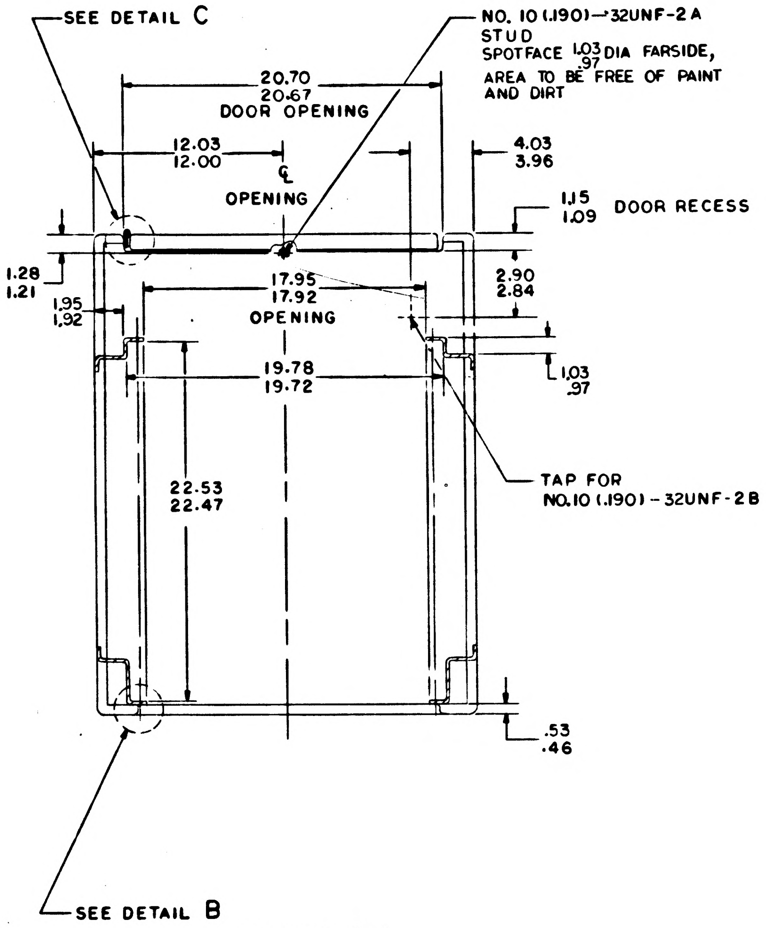
REVISIONS		
SYM	DESCRIPTION	DATE


12.03
11.96
2.78
2.75
5.53
5.52
.169
.177 DIA 4 HOLES
.20
.17
2 PLACES
.971
.96
7.26
7.23
.76
.73
2 PLACES
3.50
3.49
27.51
27.48
24.01
23.98
2.00
1.99
4.00
3.99
4.25
4.24
8.50
8.49
.221
.234 DIA
3 HOLES
TAP FOR
NO. 10 (.190)-32UNF-2B
4 HOLES WITH
MIN OF 4 THREADS
IN MATERIAL
3.50
3.49
.94
.93
RUBBER GASKET
ALL AROUND
.196
.203 DIA
3 HOLES
.78
.71
17.95
17.92 OPENING
19.78
19.72 OPENING
WELD

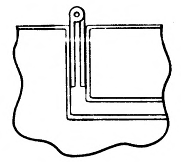
VIEW B-B
SEE SHEET 1


9.10
8.90
5.01
4.98
.51
.52 DIA
.22
.21

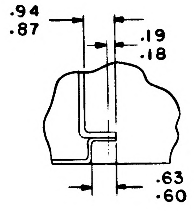
VIEW A-A
SEE SHEET 1


SEE DETAIL C
NO. 10 (.190)-32UNF-2A
STUD
SPOTFACE 1.03
.97 DIA FARSIDE,
AREA TO BE FREE OF PAINT
AND DIRT
20.70
20.67
DOOR OPENING
12.03
12.00
4.03
3.96
OPENING
1.15
1.09 DOOR RECESS
1.28
1.21
1.95
1.92
17.95
17.92
OPENING
2.90
2.84
19.78
19.72
1.03
.97
22.53
22.47
TAP FOR
NO.10 (.190)-32UNF-2B
.53
.46
SEE DETAIL B

SECTION A-A
SCALE 1/4
SEE SHEET 1



DETAIL C
SCALE 2/1


.94
.87
.19
.18
.63
.60

DETAIL B
TYP

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01752 DATE 26 J

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

LIST OF MATERIALS

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MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO
DRAWN A.G. Caggiano DATE 15 MAY 63
CHECKED R. Dowell 7 Jun 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET, ELECTRICAL EQUIP
MOBILE
SPECIFICATION CONTROL DRAWI

CODE IDENT NO. | SIZE J | NASA DRAWING NO. 100687
SCALE NONE | WT | SHEET 2

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INCHES
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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD W. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR S. Dufresne CHK JS Leger APPD W. Maynard	12/10/63	DM

TABLE I

DASH NUMBER	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NUMBER	TOTAL ROTATION			A DEGREES	B
-1	5	60°	1	20 TO 80	30	1.47 1.40

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE ONE POLE, SHORTING TYPE WITH 15° INDEX AND A FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS, AND NUMBER OF POSITIONS FOR WHICH THE ADJUSTABLE STOP IS PRESET.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

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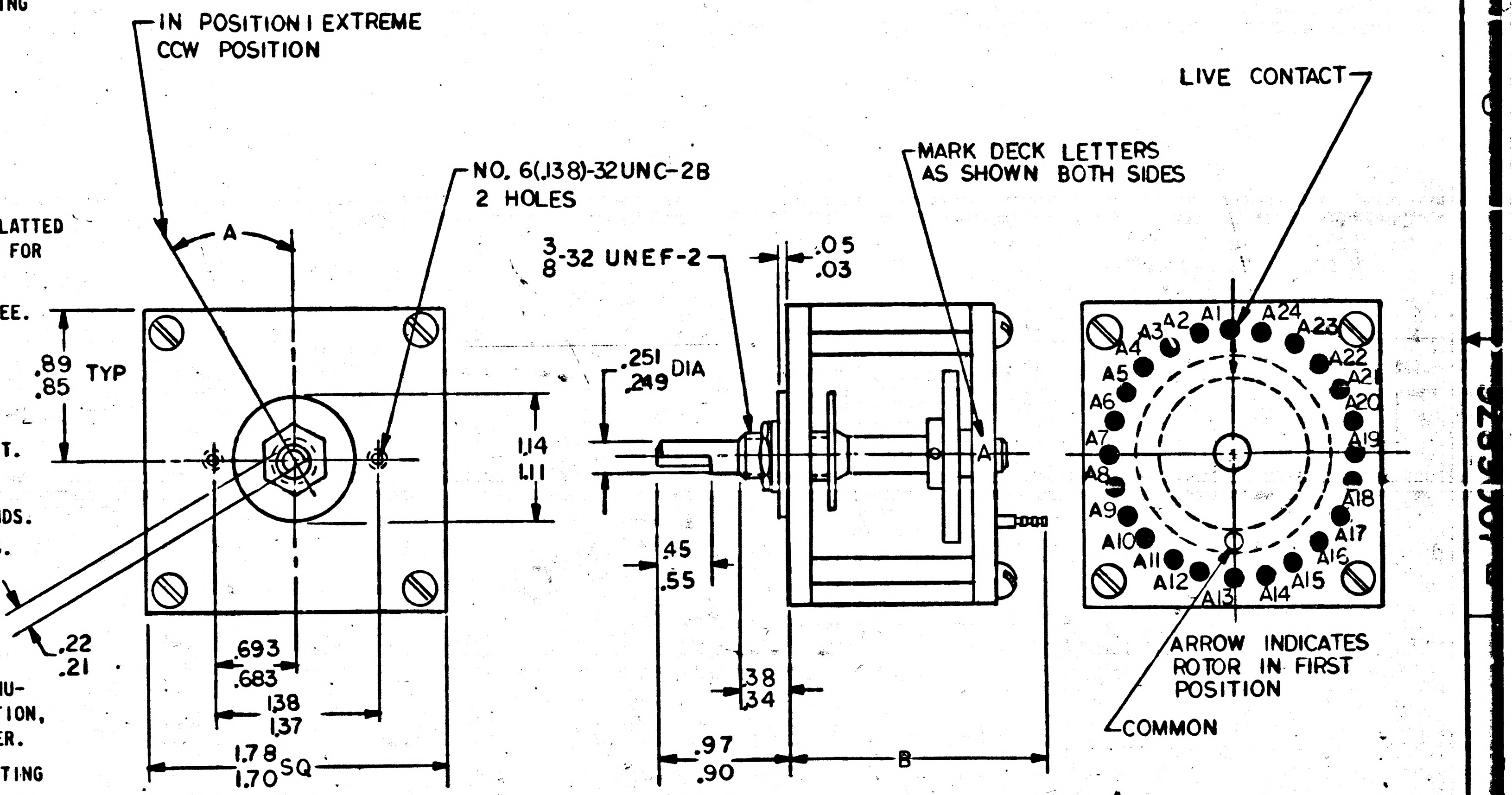

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Fravinier DATE 16 MAY 63
CHECKED J. Ruggeri
APPROVAL C Sterling 29 MAY 63
APPROVAL [illegible] 5/27/63
APPROVAL [illegible]
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL L. Gedeman 6/5/63
MIT APPROVAL [illegible] 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
24 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006875
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
—	CLASS B RELEASE PER TDRR 01454		
A	CLASS II CHANGE PER RD-R5287A DR Roy Wheeler CHK J. Ruggeri APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR J. Dufresne CHK J G Lopez APPD H. Maynard	12/10/63	DH
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17068 DR J.P. Leonard CHK C. Mazza APPD H. Maynard	3/29/65	KES

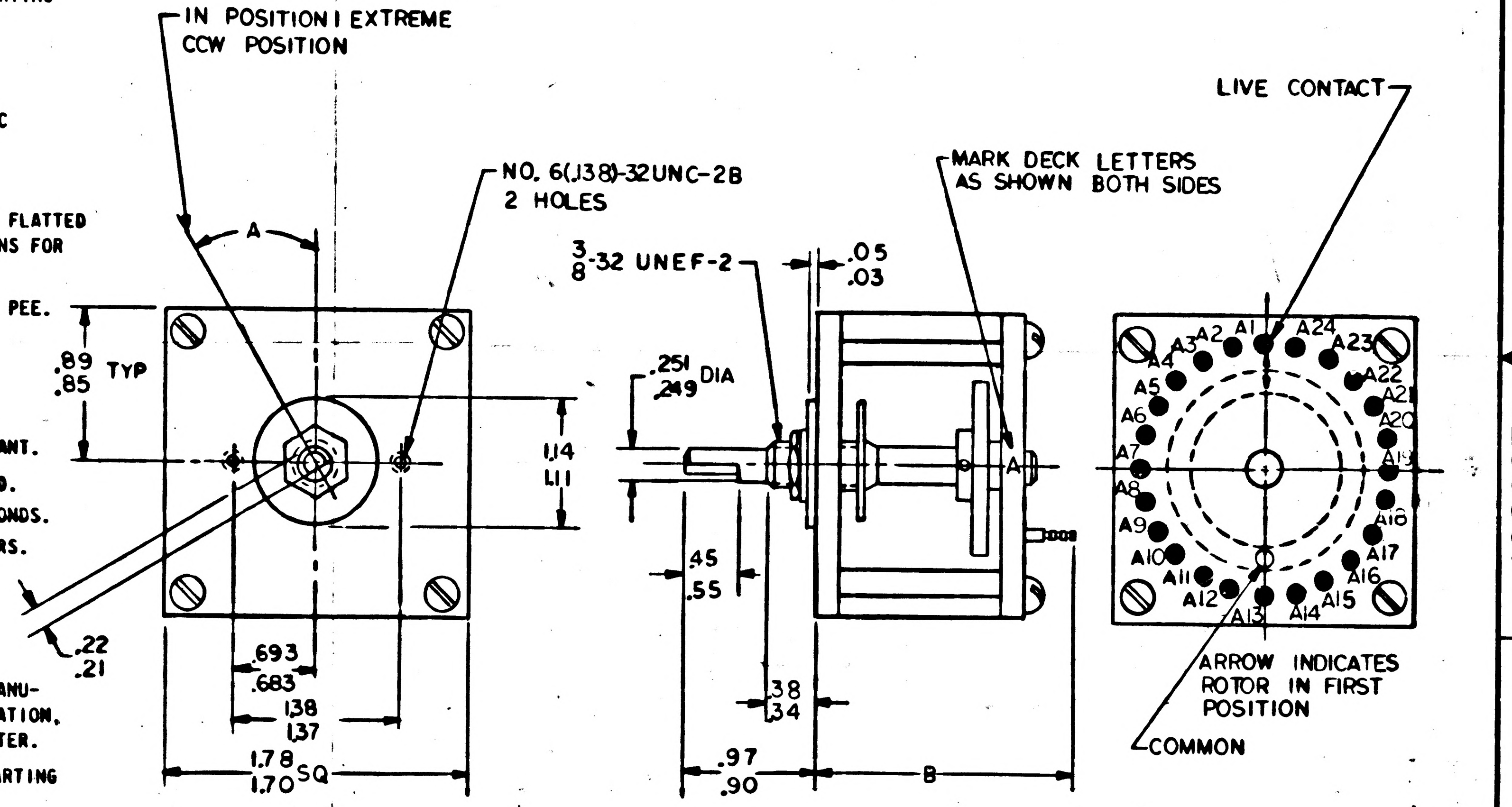
TABLE I

DASH NUMBER	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NUMBER	TOTAL ROTATION			A DEGREES	B
-1	5	60°	1	20 TO 80	30	1.47 1.40

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE ONE POLE, SHORTING TYPE WITH 15° INDEX AND A FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS, AND NUMBER OF POSITIONS FOR WHICH THE ADJUSTABLE STOP IS PRESET.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM SHAFT END.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002053.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.


IN POSITION I EXTREME CCW POSITION
A
NO. 6(.138)-32UNC-2B 2 HOLES
.89 .85 TYP
1.14 1.11
.22 .21
.693 .683
.138 .137
1.78 1.70 SQ
3/8-32 UNEF-2
.05 .03
.251 .249 DIA
.45 .55
.38 .34
.97 .90
B
MARK DECK LETTERS AS SHOWN BOTH SIDES
LIVE CONTACT
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24
ARROW INDICATES ROTOR IN FIRST POSITION
COMMON

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Prunier DATE 10 MAY 63
CHECKED J. Ruggeri
APPROVAL C. Sterling 21 MAY 63
APPROVAL 5/27/63
APPROVAL
NASA APPROVAL 6-5-63
MIT APPROVAL L. Jedman 6/5/63
MIT APPROVAL 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
24 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006876
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED

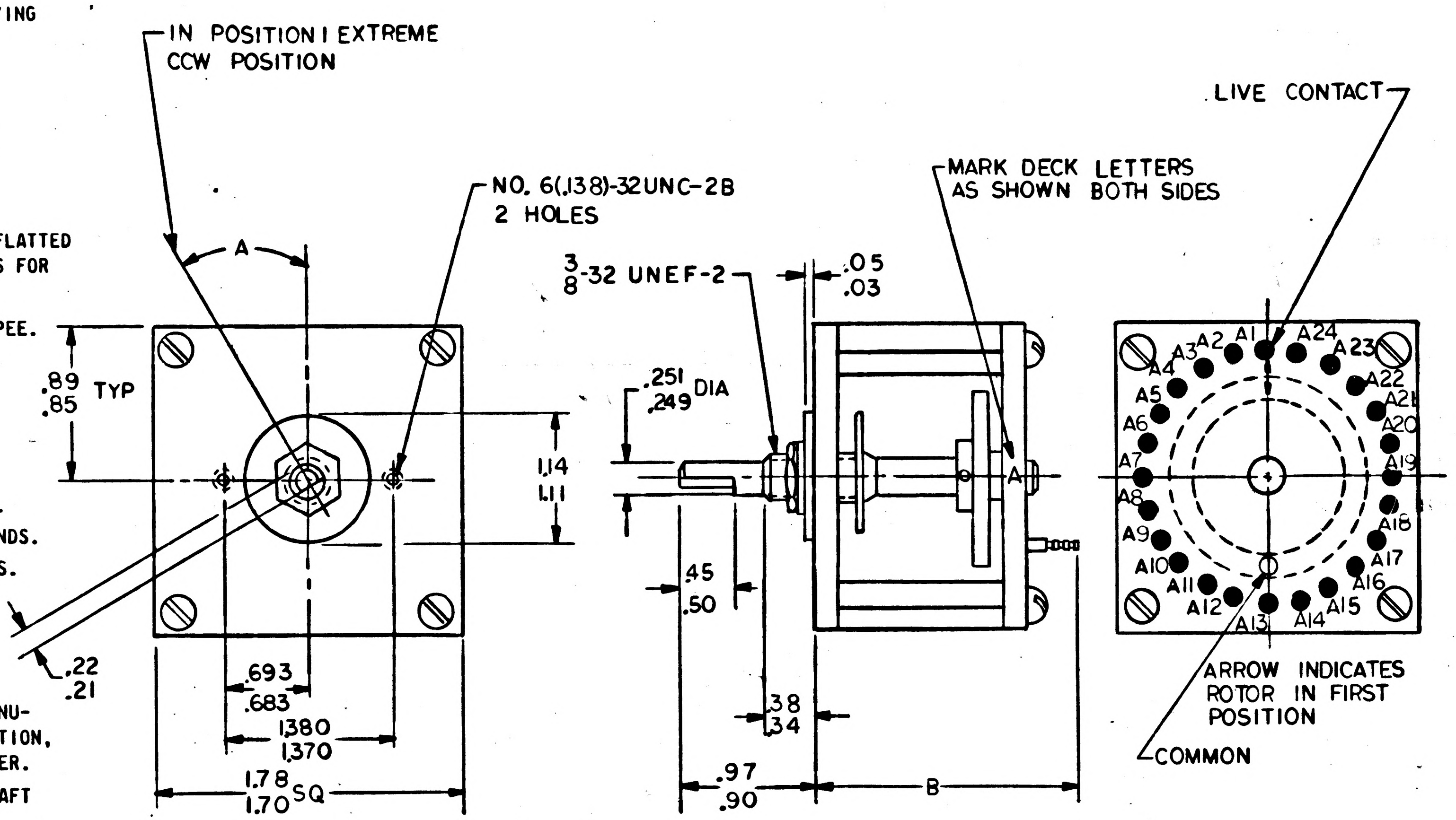
TABLE I

DASH NUMBER	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NUMBER	TOTAL ROTATION			A DEGREES	B
-1	5	60°	1	20 TO 80	30	1.47 1.40

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE ONE POLE, SHORTING TYPE WITH 15° INDEX AND A FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS, AND NUMBER OF POSITIONS FOR WHICH THE ADJUSTABLE STOP IS PRESET.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED IN SEQUENCE STARTING FROM SHAFT END, ON OPPOSITE SIDES.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 01454 DATE 6-5-63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Prunier DATE 10 MAY 63
CHECKED J. Ruggeri
APPROVAL C Sherlin 29 MAY 63
APPROVAL 5/27/63
APPROVAL 5/2/63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL L. Gedman 6/5/63
MIT APPROVAL 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
24 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006876
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

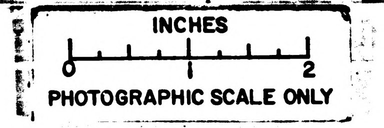


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TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1.469 1.406

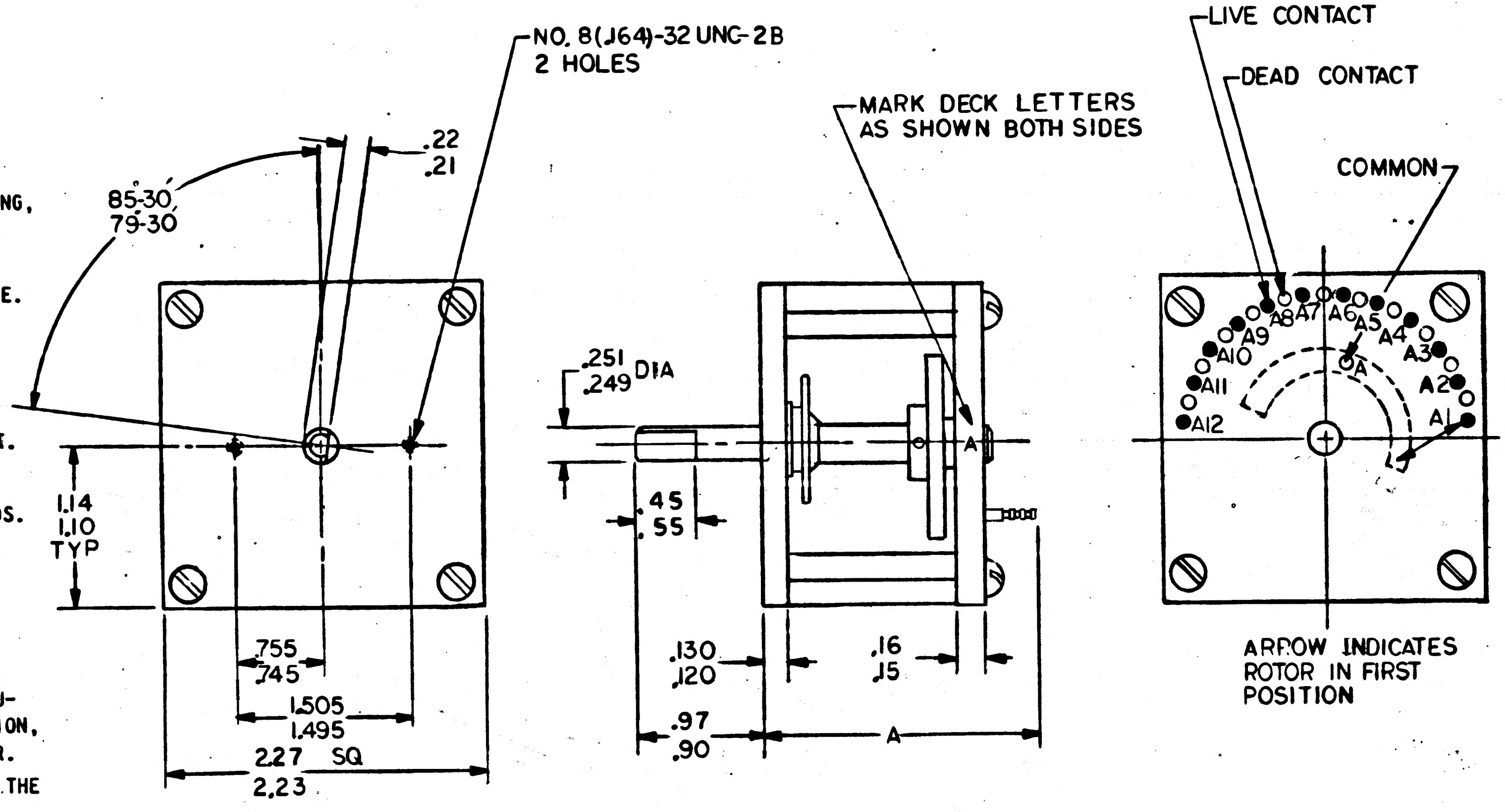
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD H Maynard	9/12/63	JS
B	REVISED PER TDRR 04301 DR S. Orifice CHK J.J. Logan APPD H Maynard	12/10/63	DM

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01394 DATE 5/29/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MAXIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 12 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 165° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE-ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN V. Pounier DATE 8 MAY 63
CHECKED A. Munn / H. Maynard 13 MAY 63
APPROVAL J. Karpuk 5/21/63
APPROVAL A.O. Dampier JJS 5/21/63
APPROVAL L. Spitzmuller J.P. 5/21/63
NASA APPROVAL Jack Barnard
MIT APPROVAL D. Hoag 5/29/63
MIT APPROVAL W. Kupfer 24 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
12 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006877
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD A. Maynard	8/12/63	[illegible]
B	REVISED PER TDRR 04301 DR [illegible] CHK J.J. Regan APPD A. Maynard	12/10/63	[illegible]
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16754 DR J.P. Leonard CHK Regan APPD A. Maynard	7/1/65	KCB

TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1.469 1.406

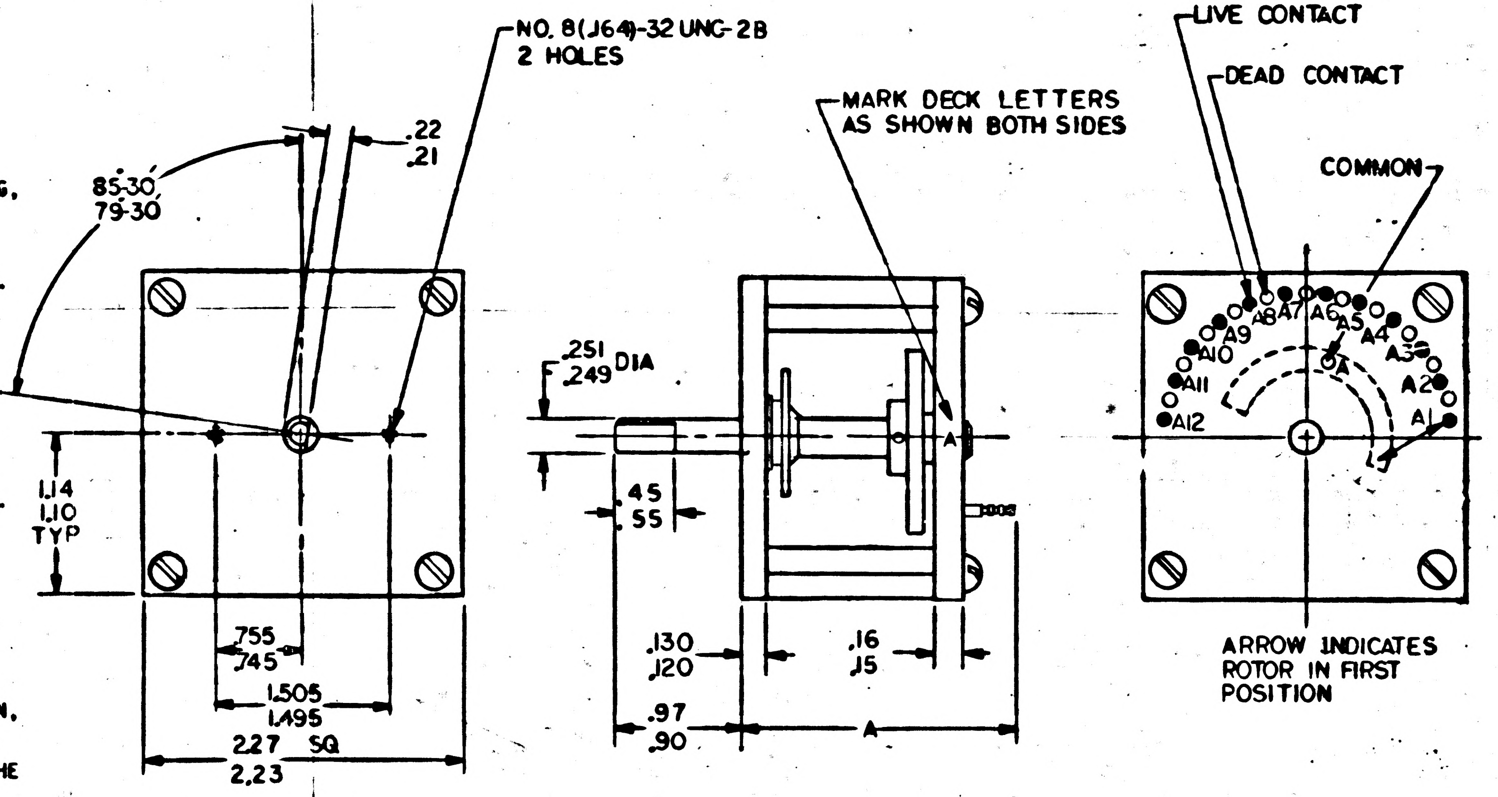
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): .2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 400 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MAXIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 12 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 165° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE FROM THE SHAFT END.

~~3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002095.~~

4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN [illegible] DATE 8 MAY 63
CHECKED [illegible] A. Maynard 13 MAY 63
APPROVAL [illegible] 5/21/63
APPROVAL [illegible] 5/21/63
APPROVAL [illegible] 5/24/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
12 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006877
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006877 C

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TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1.469 1.406

REVISIONS

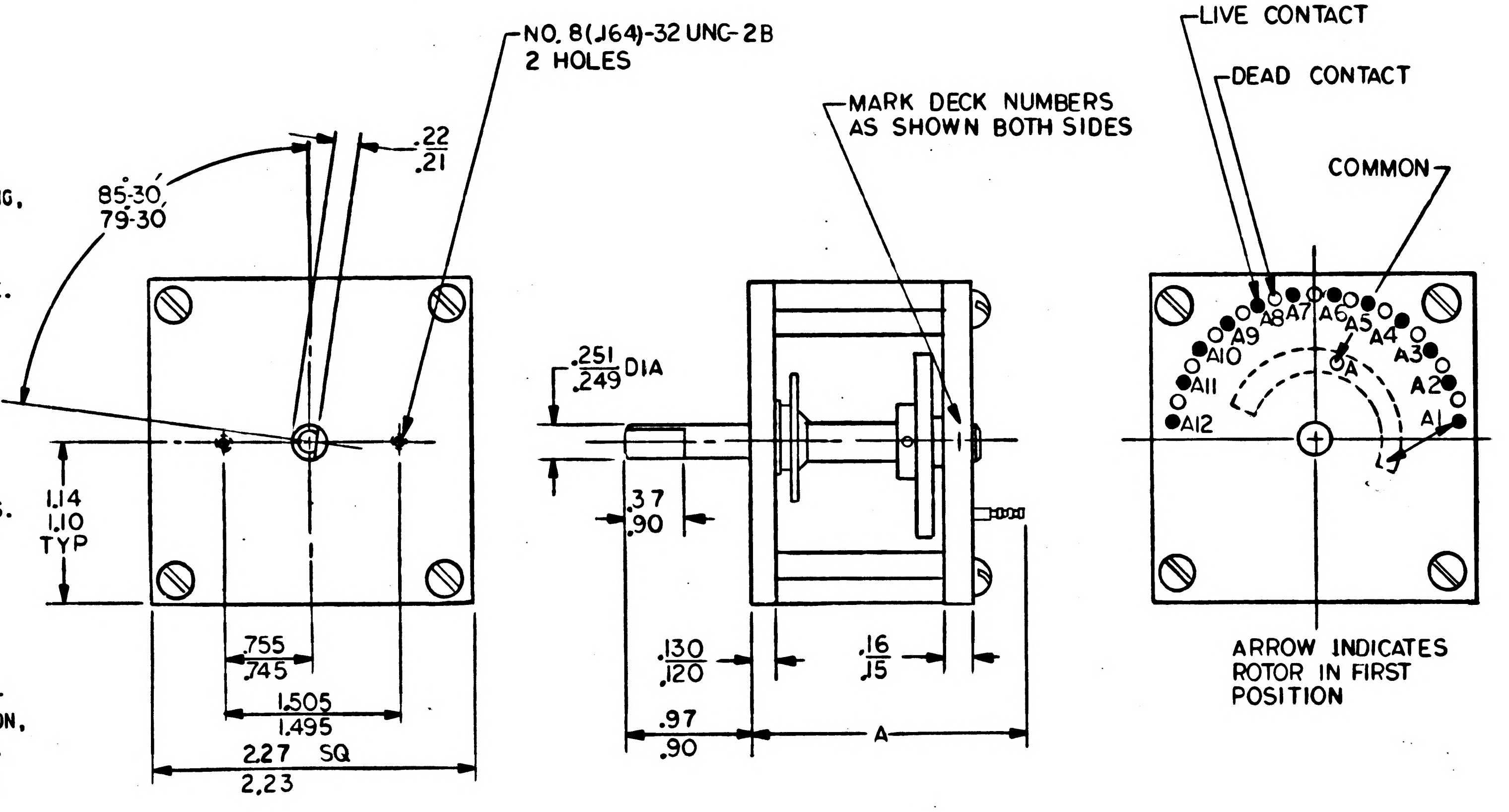
SYM	DESCRIPTION	DATE	APPROVED

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 12 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 165° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED IN NUMERICAL SEQUENCE FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01394 DATE 5/29/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Pumier DATE 8 MAY 63
CHECKED A. [illegible] / H. Maynard 13 MAY 63
APPROVAL John Karnak 5/21/63
APPROVAL R. D. Dewyer JJS 5/21/63
APPROVAL L. E. Spitternd JP 5/21/63
NASA APPROVAL Jack Barnard
MIT APPROVAL D. [illegible] 5/29/63
MIT APPROVAL W. Kupfer 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
12 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006877
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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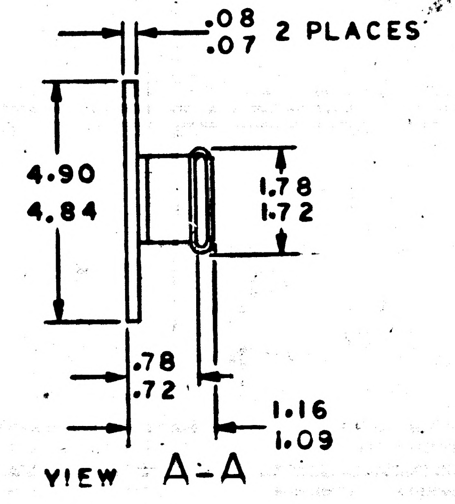
ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

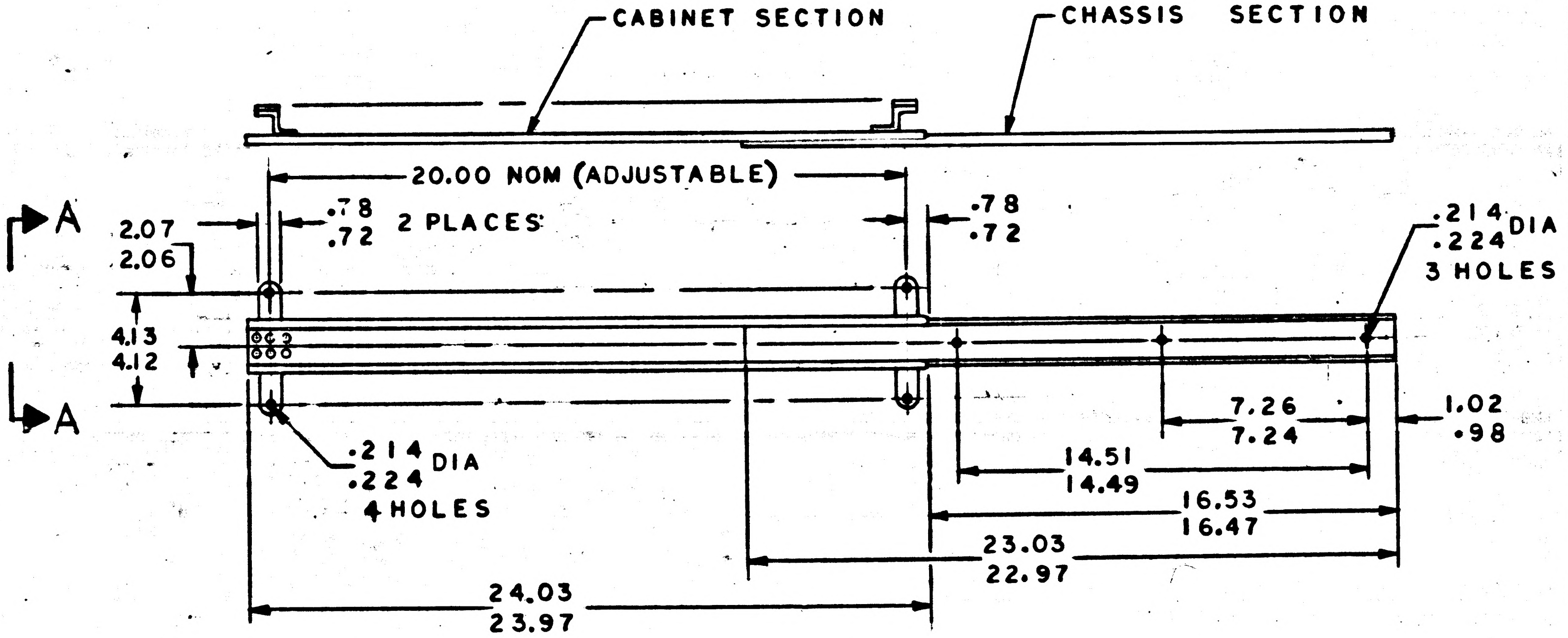
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	REPLACED WITH CHANGE BY REV B PER TDRR [illegible]	[illegible]	

NOTES:

1. GENERAL REQUIREMENTS:
   A. MARKING AND PACKAGING:
   A. (1) UNITS: PERMANENT AND LEGIBLE MARKING, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
      (2) PACKAGES: UNITS SHALL BE PACKAGED IN ACCORDANCE WITH BEST COMMERCIAL PRACTICE. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED INTERNALLY AND EXTERNALLY, PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND THE NASA PART NUMBER.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   A. MECHANICAL AND DIMENSIONS: PER THIS DRAWING.
3. DESIGN REQUIREMENTS:
   A. OPERATING LIFE: CAPABLE OF 500 IN AND OUT CYCLES OF OPERATION WITHOUT BINDING OR DRAGGING UNDER A LOAD OF 50 POUNDS NORMAL TO DIRECTION OF SLIDE TRAVELING IN THE HORIZONTAL POSITION.
   B. CONSTRUCTION:
      (1) MATERIAL: FORMED STEEL SHEET PER QQ-S-636.
      (2) FINISH: CHROMATE FILM OVER CADMIUM PLATE PER QQ-P-416, CLASS 2, TYPE II.
      (3) MOUNTING: OFFSET BRACKETS.
      (4) LUBRICATION: DRY FILM LUBRICANT PER MIL-L-25504.
      (5) ACTION: CHASSIS SECTION WILL EXTEND TO LENGTH SHOWN AND BY DEPRESSING RELEASE BUTTON MAY BE REMOVED FROM CABINET SECTION.



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 0271 DATE 7/24/63



PART NO.	DESCRIPTION
1006878-1	CHASSIS SECTION
-2	CABINET SECTION

Ⓐ REPLACED WITH CHANGE BY REV B

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN [illegible] DATE 14 June 63
CHECKED [illegible] 19 June 63
APPROVAL C. Sperling 20 June 63
APPROVAL [illegible] 6/20/63
APPROVAL [illegible]
NASA APPROVAL [illegible] 7/24/63
MIT APPROVAL [illegible] 7/24/63
MIT APPROVAL [illegible] 24 Jul 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE, CHASSIS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006878
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
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REVISIONS

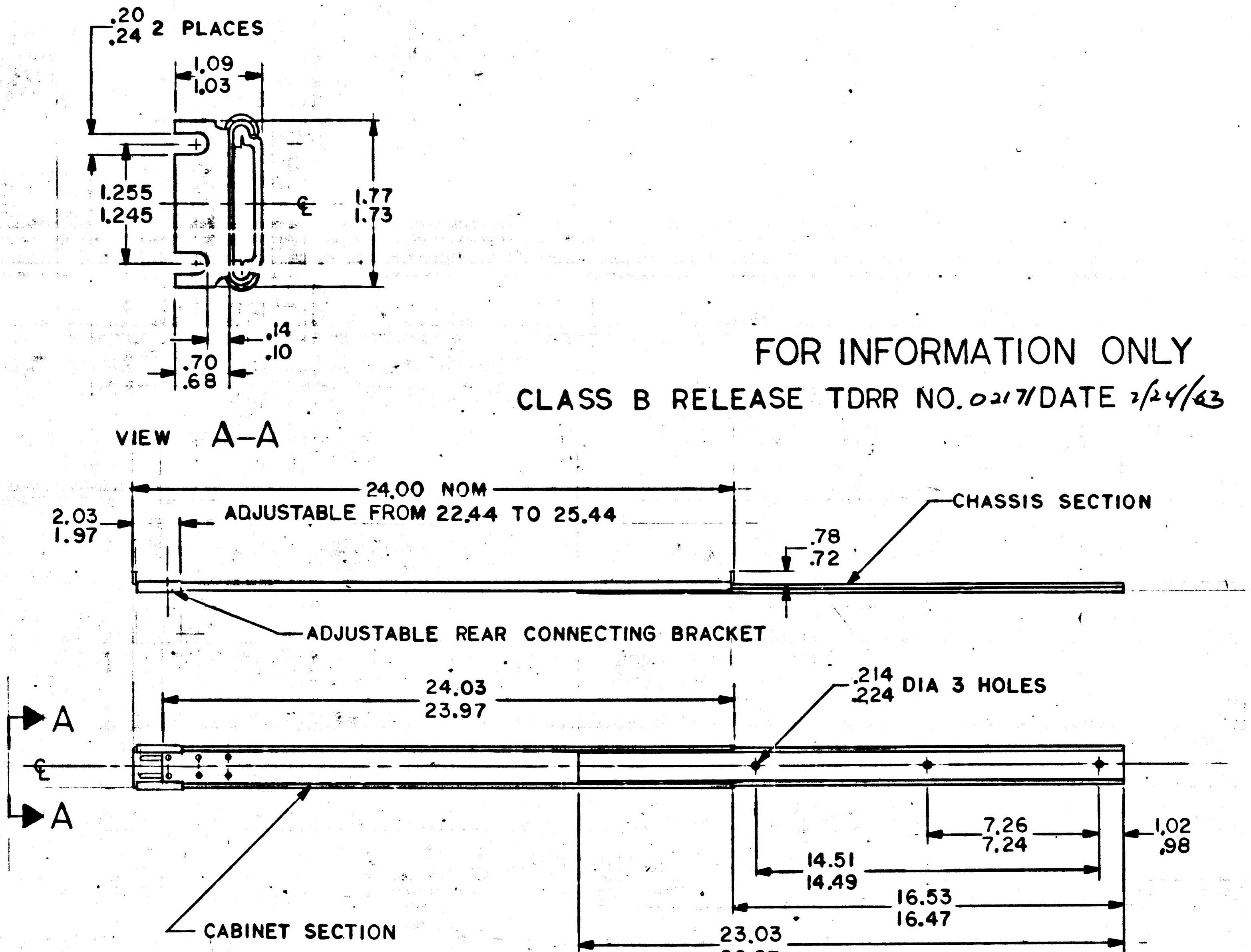
SYM	DESCRIPTION	DATE	APPROVED
-B	REPLACES REV A WITH CHANGE PER TDRR 05043	12/4/63	DNO

NOTES:

1. GENERAL REQUIREMENTS:
   A. MARKING AND PACKAGING:
      (1) UNITS: PERMANENT AND LEGIBLE MARKING PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
      (2) PACKAGES: UNITS SHALL BE PACKAGED IN ACCORDANCE WITH BEST COMMERCIAL PRACTICE. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED INTERNALLY AND EXTERNALLY, PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND THE NASA PART NUMBER.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   A. MECHANICAL AND DIMENSIONS: PER THIS DRAWING.

3. DESIGN REQUIREMENTS:
   A. OPERATING LIFE: CAPABLE OF 500 IN AND OUT CYCLES OF OPERATION WITHOUT BINDING OR DRAGGING UNDER A LOAD OF 50 POUNDS NORMAL TO DIRECTION OF SLIDE TRAVELING IN THE HORIZONTAL POSITION.
   B. CONSTRUCTION:
      (1) MATERIAL: FORMED STEEL SHEET PER QQ-S-636.
      (2) FINISH: CHROMATE FILM OVER CADMIUM PLATE PER QQ-P-416, CLASS 2, TYPE II.
      (3) MOUNTING: OPEN SLOT RIGHT ANGLE BRACKETS
      (4) LUBRICATION: DRY FILM LUBRICANT PER MIL-L-25504.
      (5) ACTION: CHASSIS SECTION WILL EXTEND TO LENGTH SHOWN AND BY DEPRESSING RELEASE BUTTON MAY BE REMOVED FROM CABINET SECTION.



FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 0217 DATE 2/24/63

PART NO.	DESCRIPTION
1006878-1	CHASSIS SECTION
-2	CABINET SECTION

Ⓑ REPLACES REV A WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS-9-498
DRAWN R. Prifice DATE 25 OCT 63
CHECKED J. Ruzzeri
APPROVAL C Sperling JPK
APPROVAL
APPROVAL KHB 11/14/63
NASA APPROVAL B Michael 12/4/63
MIT APPROVAL I Hazel 12/10/63
MIT APPROVAL Dennis M. Scolamiero 11-26-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE, CHASSIS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1006878
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

NOTES:

1. GENERAL REQUIREMENTS:
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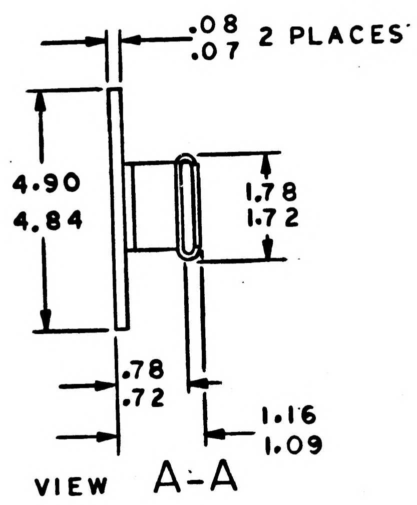
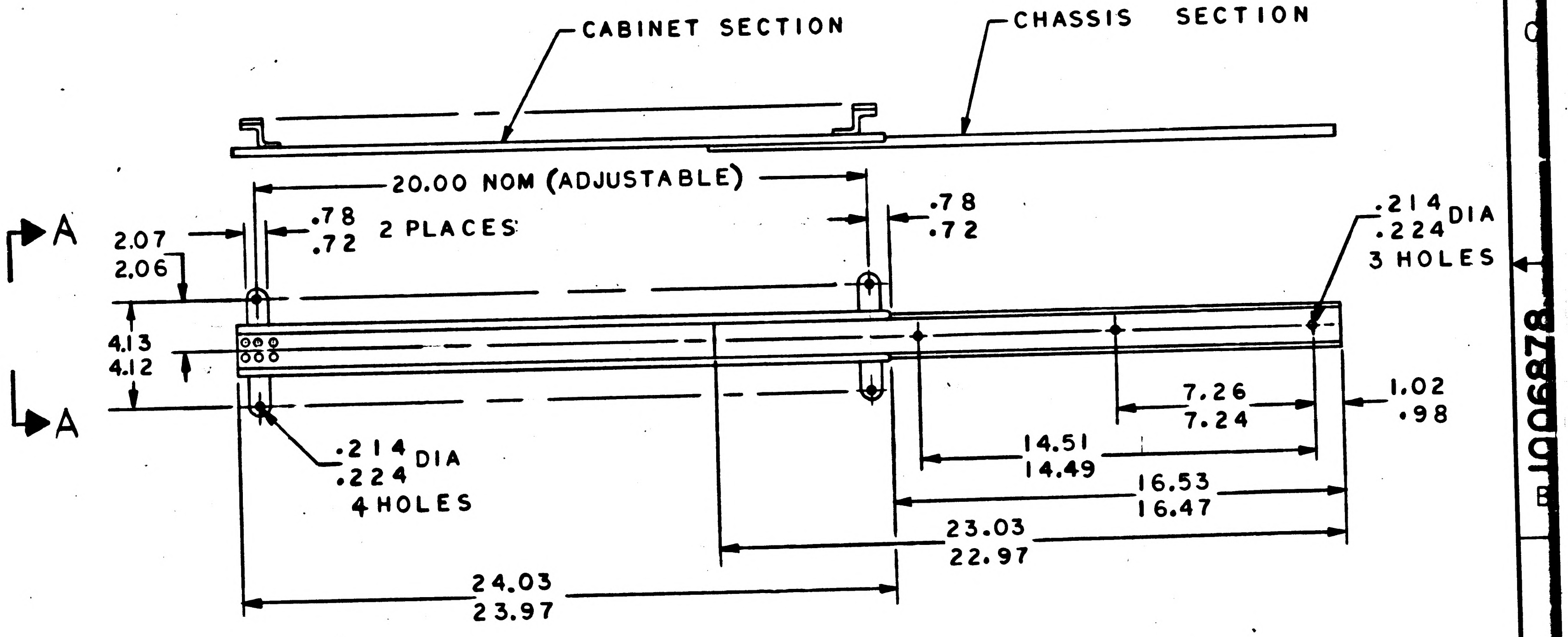
     - (2) PACKAGES: UNITS SHALL BE PACKAGED IN ACCORDANCE WITH BEST COMMERCIAL PRACTICE. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED INTERNALLY AND EXTERNALLY, PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND THE NASA PART NUMBER.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL AND DIMENSIONS: PER THIS DRAWING.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: CAPABLE OF 500 IN AND OUT CYCLES OF OPERATION WITHOUT BINDING OR DRAGGING UNDER A LOAD OF 50 POUNDS NORMAL TO DIRECTION OF SLIDE TRAVELING IN THE HORIZONTAL POSITION.
   - B. CONSTRUCTION:
     - (1) MATERIAL: FORMED STEEL SHEET PER QQ-S-636.
     - (2) FINISH: CHROMATE FILM OVER CADMIUM PLATE PER QQ-P-416, CLASS 2, TYPE II.
     - (3) MOUNTING: OFFSET BRACKETS.
     - (4) LUBRICATION: DRY FILM LUBRICANT PER MIL-L-25504.
     - (5) ACTION: CHASSIS SECTION WILL EXTEND TO LENGTH SHOWN AND BY DEPRESSING RELEASE BUTTON MAY BE REMOVED FROM CABINET SECTION.



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 0271 DATE 7/24/63



PART NO.	DESCRIPTION
1006878-1	CHASSIS SECTION
-2	CABINET SECTION

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN MSC Crespi DATE 14 June 63
CHECKED J. Rogers / H. Maynard 19 June 63
APPROVAL C. Sparling 20 June 63
APPROVAL [illegible] 6/20/63
APPROVAL [illegible] 20 June
NASA APPROVAL [illegible] 7/24/63
MIT APPROVAL [illegible] 7/24/63
MIT APPROVAL [illegible] 24 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE, CHASSIS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006878
SCALE NONE
WT
SHEET 1 OF 1

1006878

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS 02170

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 02170	7/24/63	
A	REVISED AND UPGRADED TO CLASS A PER TDRR 06149 DR R.J. DiGloria CHK A. Cuggiano APPD H. Maynard	3/10/64	w/l

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019., WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, ITEM NOMENCLATURE, NET CONTENTS, NASA DRAWING NUMBER AND REVISION LETTER, AND DATE OF MANUFACTURE.
   - C. THIS MATERIAL SHALL BE FURNISHED IN THE QUANTITIES SPECIFIED IN THE PURCHASE ORDER.
2. DESIGN REQUIREMENTS:
   - A. PHYSICAL PROPERTIES:
     - (1) COLOR: OPAQUE WHITE.
     - (2) CONSISTENCY: PASTE-LIKE; PENETRATION, WORKED, 260 TO 330, PER ASTM D217-52T.
     - (3) SPECIFIC GRAVITY: 2.65 MINIMUM.
     - (4) THERMAL CONDUCTIVITY: 0.0015 GRAM-CALORIES/SEC/CM^2/°C/CM.
     - (5) BLEED: LESS THAN 1.5 PERCENT AFTER 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.
     - (6) EVAPORATION: LESS THAN 1.5 PERCENT AFTER 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.

   - B. OPERATING TEMPERATURE RANGE: -70°C TO +200°C.
   - C. SHELF LIFE: 1 YEAR MINIMUM AT TEMPERATURES UP TO 200°C WITHOUT DETERIORATION.

ORIGINAL SOURCE OF SUPPLY

DOW CORNING CORP.

PURCHASE PER QUALIFICATION STATUS LIST ND 1002034

ND 1002034 FOR THIS DRAWING.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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DIMENSIONS ARE IN INCHES
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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 18 June 63 19 June '63
CHECKED
APPROVAL 7 July 63
APPROVAL 7/15/63
APPROVAL 6/28/63
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63
MIT APPROVAL 24 Jul 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE COMPOUND, THERMOCONDUCTIVE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006879
SCALE NONE WT SHEET 1 OF 1

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

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REVISIONS 02170

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 02170	7/24/63	
A	REVISED AND UPGRADED TO CLASS A PER TDRR 06149 DR R.J.D. Glenn CHK A. Cuggiano APPD H. Maynard	3/10/64	WK
B	CHANGED PER TDRR 11329	9/12/64	WK
C	REPLACED BY REV D WITH CHANGE PER TDRR 17169	3-9-65	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, ITEM NOMENCLATURE, NET CONTENTS, NASA DRAWING NUMBER AND REVISION LETTER, AND DATE OF MANUFACTURE.
   - C. THIS MATERIAL SHALL BE FURNISHED IN THE QUANTITIES SPECIFIED IN THE PURCHASE ORDER.
2. DESIGN REQUIREMENTS:
   - A. PHYSICAL PROPERTIES:
     - (1) COLOR: OPAQUE WHITE.
     - (2) CONSISTENCY: PASTE-LIKE; PENETRATION, WORKED, 250 TO 320 PER ASTM D217-52T.
     - (3) SPECIFIC GRAVITY: 2.30 MINIMUM.
     - (4) THERMAL CONDUCTIVITY: 0.0015 GRAM-CALORIES/SEC/CM^2/°C/CM.
     - (5) BLEED: LESS THAN 0.5 PERCENT AFTER 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.
     - (6) EVAPORATION: LESS THAN 1.0 PERCENT AFTER 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.

3.

   - B. OPERATING TEMPERATURE RANGE: -70°C TO +200°C.
   - C. SERVICE LIFE: 1 YEAR MINIMUM AT TEMPERATURES UP TO 200°C WITHOUT DETERIORATION.
   - D. SHELL LIFE: INDEFINITE IN CLOSED CONTAINERS AT ROOM AMBIENT TEMPERATURE

Ⓒ REPLACED BY REV (D) WITH CHANGE

ORIGINAL SOURCE OF SUPPLY

DOW CORNING CORP.
[illegible]

PURCHASE PER QUALIFICATION STATUS LIST ND 1002034
ND 1002034 FOR THIS DRAWING.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Ray Wheeler DATE 18 June 63
CHECKED J. Cuggiano / H. Maynard 19 June '63
APPROVAL 16 July 63
APPROVAL 7/15/63
APPROVAL L. E. Spitteri 6/28/63
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 Jul 63
MIT APPROVAL 24 Jul 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE COMPOUND, THERMOCONDUCTIVE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006879
SCALE NONE
WT
SHEET 1 OF 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
	D	REPLACES REV C WITH CHANGES PER TDRR 17169			3-9-65	WK

REQUIREMENTS

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER PROCESS AND QUALITY CONTROL INCLUDING FINAL TESTING SHALL BE IN ACCORDANCE WITH SPECIFICATION ND1015404, CLASS 3.

   C. EACH CONTAINER OF THE COMPOUND OR UNIT CARTON, IF PROCURED IN COLLAPSIBLE TUBES, SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, ITEM NAME, NASA DRAWING NUMBER AND REVISION LETTER, NET CONTENTS, LOT NUMBER AND DATE OF MANUFACTURER.

2. ACCEPTANCE AND INSPECTION:

   A. MATERIAL: THE COMPOUND SHALL BE A SILICONE OIL BLENDED TO A PASTE-LIKE CONSISTENCY WITH INORGANIC SILICA AND METAL OXIDES.

      (1) COLOR: OPAQUE WHITE

      (2) CONSISTENCY: WORKED AND MEASURED WITHIN ONE MINUTE AFTER WORKING PENETRATION 250 TO 320 WHEN TESTED PER ASTM D217.

      (3) SPECIFIC GRAVITY: 2.3 MINIMUM AT 77° ± 2°F WHEN TESTED PER METHOD 4184 OF FED. STD. 141 OR EQUIVALENT.

      (4) THERMAL CONDUCTIVITY: 0.0015 gm/cal/sec/cm^2/C°/CM

      (5) BLEED: THE BLEED SHALL BE 0.5% MAXIMUM AND THE EVAPORATION SHALL BE 1.0% MAXIMUM WHEN TESTED PER METHOD 321.1 OF FED. STD 791 OR EQUIVALENT EXCEPT THAT:

         (a) THE CONE SHALL BE SUSPENDED FROM A ROD SUPPORTED ON THE EDGE OF THE BEAKER, WITHOUT COVERING THE BEAKER.

         (b) THE OVEN SHALL BE MAINTAINED AT 200° ± 5°C.

         (c) THE TEST TIME SHALL BE 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.

      (6) EVAPORATION: LESS THAN 1.0% AFTER 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.

3. DESIGN:

   A. OPERATING TEMPERATURE RANGE: -70°C TO +200°C.

   B. SERVICE LIFE: 1 YEAR MINIMUM OF TEMPERATURE UP TO 200°C WITHOUT DETERIORATION.

   C. SHELF LIFE: THE MATERIAL SHALL HAVE NOT LESS THAN ONE YEAR SHELF LIFE REMAINING WHEN RECEIVED BY THE PURCHASER AND STORED BELOW 100°F IN UNOPENED CONTAINER.

   D. INTENDED USE: THIS MATERIAL IS INTENDED FOR USE IN INCREASING HEAT TRANSFER BETWEEN MATING SURFACES. A TYPICAL THERMAL CONDUCTIVITY FOR THIS MATERIAL IS 0.0010 GRAM-CALORIES /SEC/CM^2/°C/CM

   AS AN ELECTRICAL INSULATOR, THE VOLUME RESISTIVITY IS 2.5×10^{15} OHM-CM (TYPICAL)

MASTER

(D) REPLACES REV (C) WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	a. Marts	3-4-65
CHECKED	W. Simpson	3-4-65
APPROVED		4 Mar 65
APPROVED		
APPROVED MIT		9 Mar 65
APPROVED MSC		3-9-65
		DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE COMPOUND
THERMOCONDUCTIVE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
—	C	1006879

SCALE NONE

SHEET 1 OF 1

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

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REVISIONS 02170			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, ITEM NOMENCLATURE, NET CONTENTS, NASA DRAWING NUMBER AND REVISION LETTER, AND DATE OF MANUFACTURE.
   - C. THIS MATERIAL SHALL BE FURNISHED IN THE QUANTITIES SPECIFIED IN THE PURCHASE ORDER.
2. DESIGN REQUIREMENTS:
   - A. PHYSICAL PROPERTIES:
     - (1) COLOR: OPAQUE WHITE.
     - (2) CONSISTENCY: PASTE-LIKE; PENETRATION, WORKED, 280 TO 350, PER ASTM D217-52T.
     - (3) SPECIFIC GRAVITY: 2.70 MINIMUM.
     - (4) THERMAL CONDUCTIVITY: 0.0015 GRAM-CALORIES/SEC/CM^2/°C/CM.
     - (5) BLEED: 1.5 PERCENT AFTER 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.
     - (6) EVAPORATION: 1.5 PERCENT AFTER 24 HOURS AT 200°C WHEN TESTED USING EQUIPMENT PER MIL-I-8660.
   - B. OPERATING TEMPERATURE RANGE: -70°C TO +200°C.
   - C. SHELF LIFE: 1 YEAR MINIMUM AT TEMPERATURES UP TO 200°C WITHOUT DETERIORATION.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02170 **DATE** 7/24/63

ORIGINAL SOURCE OF SUPPLY

DOW CORNING CORP.
MIDLAND, MICH
CODE IDENT NO. 71984
PART NUMBER DC 340

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN Ray Wheeler DATE 18 June 63
CHECKED 19 June 63
APPROVAL 16 July 63
APPROVAL 7/15/63
APPROVAL 6/28/63
NASA APPROVAL 7/24/63
MIT APPROVAL W Kupfer 24 July 63
MIT APPROVAL 24 Jul 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICONE COMPOUND, THERMOCONDUCTIVE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——
SIZE C
NASA DRAWING NO. 1006879
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 01856	7/2/63	
A	CLASS II CHANGE PER RD-R5311 DR Ray Wheeler CHK J. Rogers APPD H. Maynard	9/11/63	
B	CHANGE PER TDRR 05671 DR Ken Bull CHK J. Marinaro APPD H. Morse	1/28/64	

NOTES:

1. GENERAL REQUIREMENTS:

   A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   B. MANUFACTURER'S NAMEPLATE, IDENTIFICATION OF UNIT, ADDRESS, TRADEMARK ETC, TO APPEAR ON REAR OF UNIT TOGETHER WITH THE NASA DRAWING NUMBER, AND REVISION LETTER.
   (THIS INFORMATION NOT TO APPEAR ON FRONT PANEL).

2. DESIGN REQUIREMENTS:

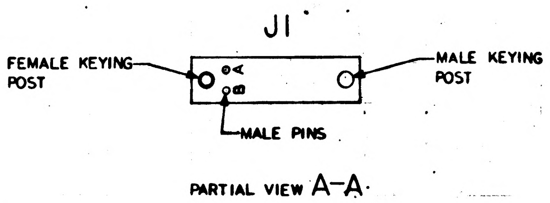
   A. CONSTRUCTION: SPECIAL WIDTH PANEL SHALL BE FINISHED BY PAINTING FRONT AND EDGES WITH ONE COAT OF SEMIGLOSS ENAMEL TT-E-529, CLASS B, COLOR NO. 26440 OF FED-STD-595, PER MIL-F-14072, P513, TYPE I EXCEPT CHROMATE FILM SHALL BE ELECTRICALLY CONDUCTIVE.

   B. CODE CHANNEL AND TAPE CAPACITY: 1 INCH TAPE FOR 8 STANDARD CODE CHANNELS.

   C. FRONT PANEL MARKING: SILK SCREEN .12 HIGH BLACK CHARACTERS PER ND 1002019 UNLESS OTHERWISE SPECIFIED.

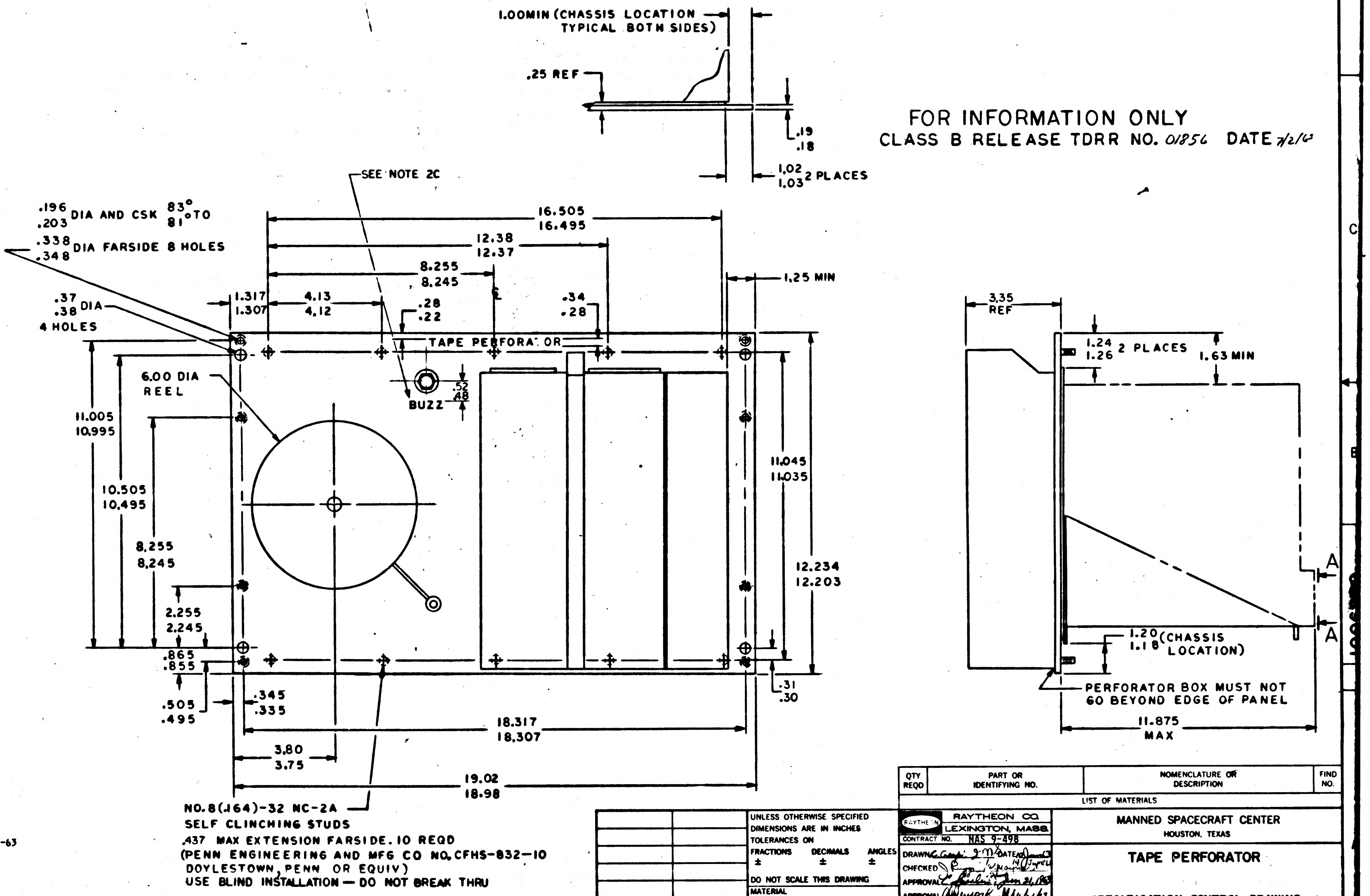
   D. FRONT PANEL HARDWARE TO BE MS 35200 (CROSS RECESSED, FLAT HEAD) WHERE POSSIBLE. PAN HEAD HARDWARE TO BE MS 35216.

   E. EACH UNIT SHALL BE SUPPLIED TOGETHER WITH 2 COPIES OF AN OPERATING INSTRUCTION AND MAINTENANCE MANUAL.


J1
FEMALE KEYING POST
MALE KEYING POST
MALE PINS

PARTIAL VIEW A-A

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01856 DATE 7/2/63


1.00MIN (CHASSIS LOCATION TYPICAL BOTH SIDES)
.25 REF
.19 .18
1.02 1.03 2 PLACES
SEE NOTE 2C
.196 .203 DIA AND CSK 83° 81° TO .338 .348 DIA FARSIDE 8 HOLES
16.505 16.495
12.38 12.37
8.255 8.245
1.25 MIN
.37 .38 DIA 4 HOLES
1.317 1.307
4.13 4.12
.28 .22
.34 .28
TAPE PERFORATOR
BUZZ
.52 .48
6.00 DIA REEL
11.005 10.995
10.505 10.495
8.255 8.245
2.255 2.245
.865 .855
.505 .495
.345 .335
11.045 11.035
12.234 12.203
.31 .30
18.317 18.307
3.80 3.75
19.02 18.98
NO.8(.164)-32 NC-2A
SELF CLINCHING STUDS
.437 MAX EXTENSION FARSIDE. 10 REQD
(PENN ENGINEERING AND MFG CO NO. CFHS-832-10
DOYLESTOWN, PENN OR EQUIV)
USE BLIND INSTALLATION — DO NOT BREAK THRU
3.35 REF
1.24 1.26 2 PLACES
1.63 MIN
A
A
1.20 1.18 (CHASSIS LOCATION)
PERFORATOR BOX MUST NOT GO BEYOND EDGE OF PANEL
11.875 MAX

ORIGINAL SOURCE OF SUPPLY:
TALLY REGISTER CORPORATION
SEATTLE 9, WASHINGTON
CODE IDENT NO.
MODEL NO. 420PR-48-6 (AS MODIFIED ABOVE) WITH DRIVE UNIT NO. 1588 AND LOW TAPE SENSOR, ALL AS DELINEATED IN CATALOGUE NO. ES-1588/5-22-63

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN [illegible] DATE 10 June 63
CHECKED [illegible] 14 June 63
APPROVAL [illegible] Jan 21, 1963
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 7/2/63
MIT APPROVAL [illegible] 7/2/63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE PERFORATOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006880
SCALE NONE
WT
SHEET 1 OF 1

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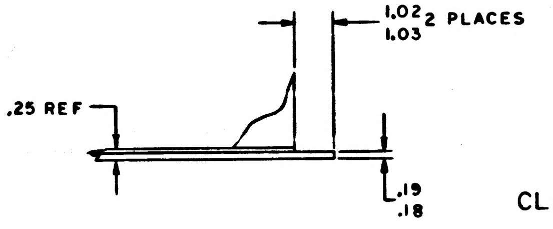
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 01856	7/2/63	

NOTES:

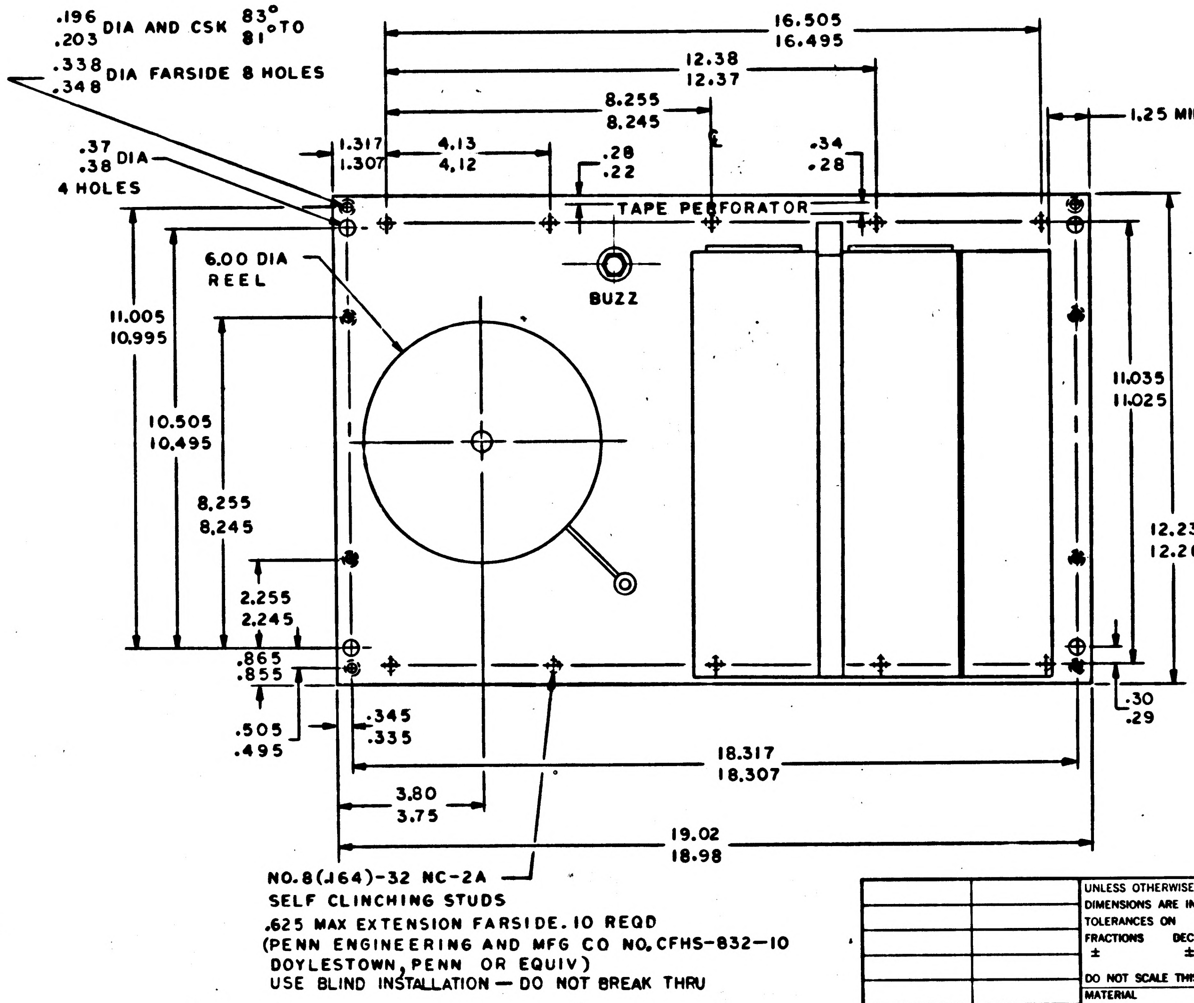
1. GENERAL REQUIREMENTS:
   - A. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - B. MANUFACTURER'S NAMEPLATE, IDENTIFICATION OF UNIT, ADDRESS, TRADEMARK ETC, TO APPEAR ON REAR OF UNIT TOGETHER WITH THE NASA DRAWING NUMBER, AND REVISION LETTER.

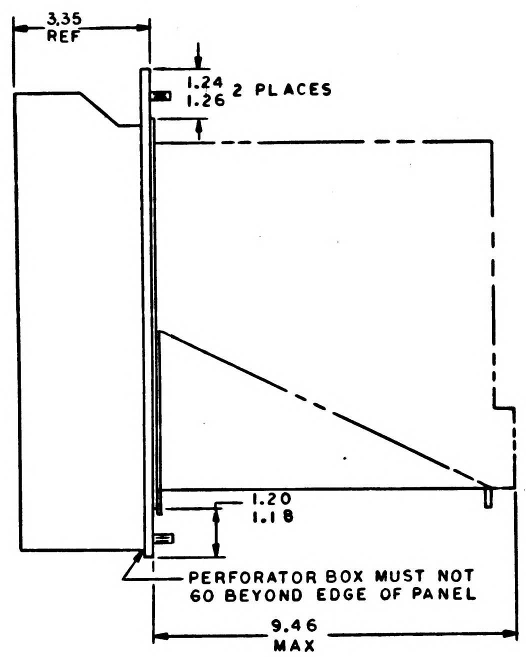
     (THIS INFORMATION NOT TO APPEAR ON FRONT PANEL).

2. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: SPECIAL WIDTH PANEL SHALL BE FINISHED BY PAINTING FRONT AND EDGES WITH ONE COAT OF SEMIGLOSS ENAMEL TT-E-529, CLASS B, COLOR NO. 26440 OF FED-STD-595, PER MIL-F-14072, P513, TYPE I EXCEPT CHROMATE FILM SHALL BE ELECTRICALLY CONDUCTIVE.
   - B. CODE CHANNEL AND TAPE CAPACITY: 1 INCH TAPE FOR 8 STANDARD CODE CHANNELS.
   - C. FRONT PANEL MARKING: SILK SCREEN .12 HIGH BLACK CHARACTERS PER ND 1002019 UNLESS OTHERWISE SPECIFIED.
   - D. FRONT PANEL HARDWARE TO BE MS 35200 (CROSS RECESSED, FLAT HEAD) WHERE POSSIBLE. PAN HEAD HARDWARE TO BE MS 35216.
   - E. EACH UNIT SHALL BE SUPPLIED TOGETHER WITH 2 COPIES OF AN OPERATING INSTRUCTION AND MAINTENANCE MANUAL.


1.02
1.03 2 PLACES
.25 REF
.19
.18

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01856 DATE 7/2/63


.196
.203 DIA AND CSK 83°
81° TO
.338
.348 DIA FARSIDE 8 HOLES
.37
.38 DIA
4 HOLES
16.505
16.495
12.38
12.37
8.255
8.245
1.317
1.307
4.13
4.12
.28
.22
.34
.28
1.25 MIN
TAPE PERFORATOR
6.00 DIA
REEL
BUZZ
11.005
10.995
10.505
10.495
8.255
8.245
2.255
2.245
.865
.855
.505
.495
.345
.335
11.035
11.025
12.234
12.203
.30
.29
18.317
18.307
3.80
3.75
19.02
18.98
NO. 8(.164)-32 NC-2A
SELF CLINCHING STUDS
.625 MAX EXTENSION FARSIDE. 10 REQD
(PENN ENGINEERING AND MFG CO NO. CFHS-832-10
DOYLESTOWN, PENN OR EQUIV)
USE BLIND INSTALLATION — DO NOT BREAK THRU


3.35
REF
1.24
1.26 2 PLACES
1.20
1.18
PERFORATOR BOX MUST NOT
GO BEYOND EDGE OF PANEL
9.46
MAX

ORIGINAL SOURCE OF SUPPLY:

TALLY REGISTER CORPORATION
SEATTLE 9, WASHINGTON
CODE IDENT NO.
MODEL NO. 420PR-48-6 (AS MODIFIED ABOVE) WITH DRIVE UNIT NO. 1424A AND LOW TAPE SENSOR, ALL AS DELINEATED IN CATALOGUE NO. 1-63-57939.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 10 June 63
CHECKED 14 June 63
APPROVAL Jan 21, 1963
APPROVAL
APPROVAL
NASA APPROVAL 7/2/63
MIT APPROVAL 7/2/63
MIT APPROVAL 7/2/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE PERFORATOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006880
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 02384		

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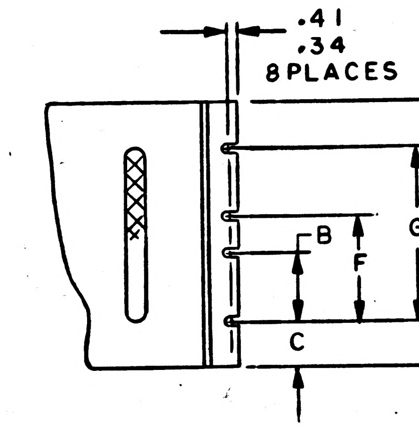
NOTES:

1. GENERAL REQUIREMENTS:
   - A. THESE FILTERS SHALL BE REPLACEABLE TYPE WASHABLE ALUMINUM MESH IN AN ALUMINUM FRAME.
   - B. FILTERING CHARACTERISTICS: UNITS SHALL BE CAPABLE OF ARRESTING AND RETAINING 85% OF PARTICLES 5 MICRONS OR LARGER WHEN SUITABLY SPRAYED WITH OIL INTENDED FOR THE PURPOSE.
   - C. AIRFLOW PERFORMANCE: SEE FIGURE I.
   - D. MATERIAL AND FINISH:
     - (1) FILTER ELEMENT: ALUMINUM MESH IN AN ALUMINUM FRAME.
     - (2) ADAPTER AND GRILLE: STEEL, PAINTED WITH ONE COAT OF SEMIGLOSS ENAMEL TT-E-529, CLASS B, COLOR NO. 26440 OF FED-STD-595, PER MIL-F-14072.
   - E. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - F. MARKING: THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER AND DATE OF MANUFACTURE TO APPEAR ON REAR OF UNIT.

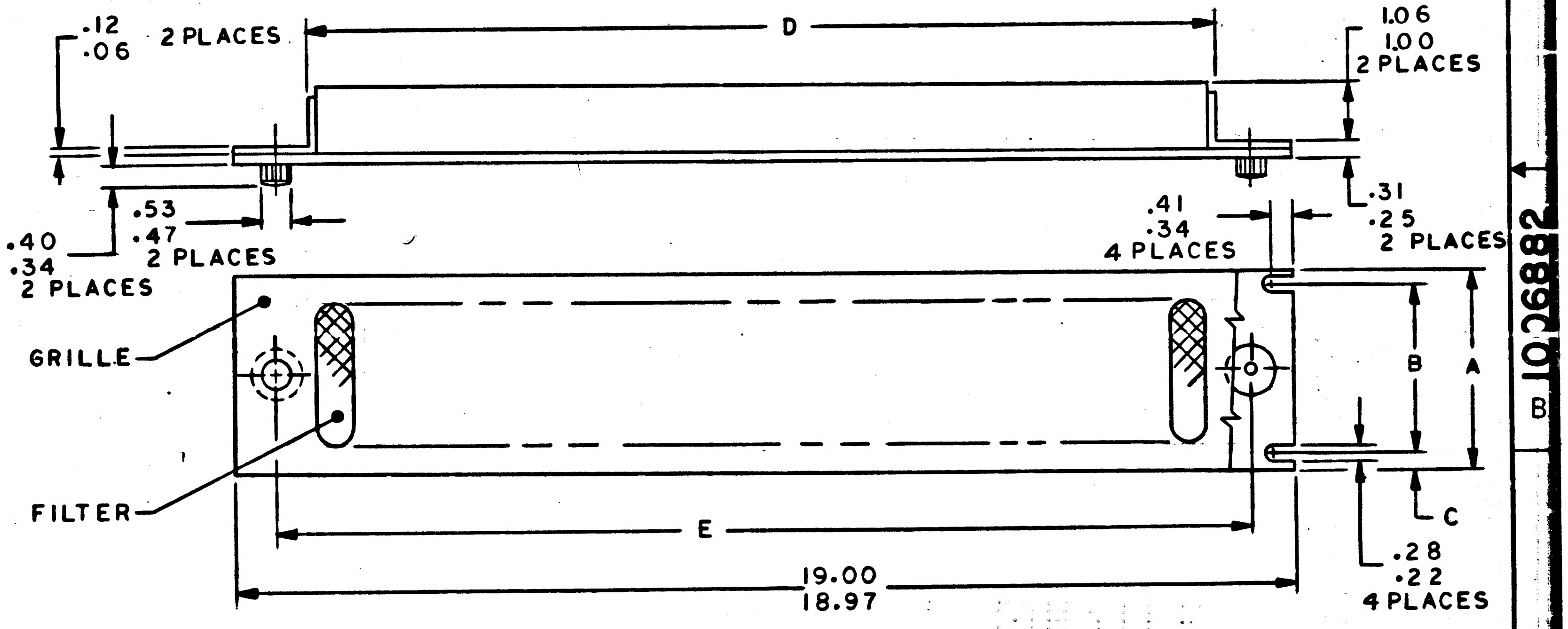


1006882—4
1006882—5

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02384 DATE Aug 03

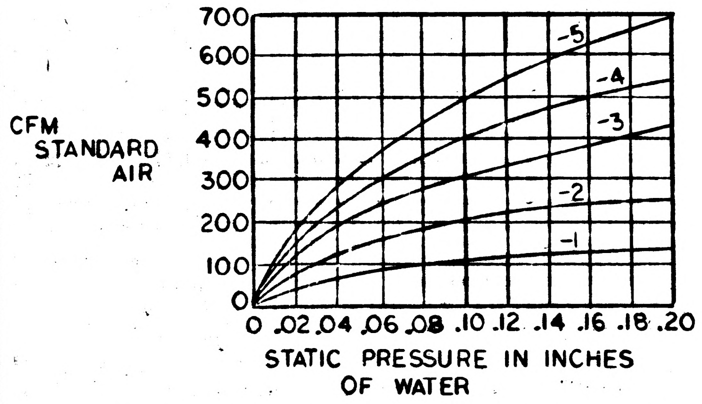
TABLE I

DASH NO.	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E	DIM. F	DIM. G
-1	3.50 3.47	3.03 2.97	.28 .22	16.22 16.16	17.53 17.47	-	-
-2	5.25 5.22	2.28 2.22	1.53 1.47	16.22 16.16	17.53 17.47	-	-
-3	7.00 6.97	4.03 3.97	1.53 1.47	16.22 16.16	17.53 17.47	-	-
-4	8.75 8.72	2.28 2.22	1.53 1.47	17.22 17.16	18.03 17.97	3.56 3.50	5.78 5.72
-5	10.50 10.47	2.28 2.22	1.53 1.47	17.22 17.16	18.03 17.97	5.28 5.22	7.53 7.47



1006882-1
1006882-2
1006882-3

FIG. I



INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Crespi DATE 17 Mar 63
CHECKED J. Ruggeri 29 Apr 63
APPROVAL 6/6/63
APPROVAL 6/6/63
APPROVAL 6/6/63
NASA APPROVAL 8/7/63
MIT APPROVAL L Gedman 8/6/63
MIT APPROVAL 8/7/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FILTER, AIR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006882
SCALE NONE
WT
SHEET 1 OF 1

1006882

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 1603	6/19/63	
A	CLASS II CHANGE PER RD-R5292 CHK J. Ruggiero APPD Maynard	8/14/63	
B -	REVISED PER TDRR 08580 DR. K. Bell CHK Walkowicz APPD Maynard	6/1/64	KEB

NOTES:

1. GENERAL REQUIREMENTS:
   - A. AIR VOLUME/STATIC PRESSURE: SEE FIGURE 1.
   - B. POWER REQUIRED: 8 WATTS MAXIMUM.
   - C. VOLTAGE: 115 VOLTS ± 10%, 50-60 CPS, 1 PHASE.
   - D. SPEED, FREE RUNNING: 2000 RPM.
2. CONSTRUCTION:
   - A. FAN AND VENTURI BLOCK: PLASTIC AND ALUMINUM SKELETON FAN MOUNTED IN PLASTIC VENTURI BLOCK.
   - B. FILTER ASSEMBLY: FILTER ELEMENT, FILTER BOX (OR HOLDER), AND MOUNTING CLIPS.
   - C. BEARINGS: PRELUBRICATED SLEEVE BEARINGS.
3. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

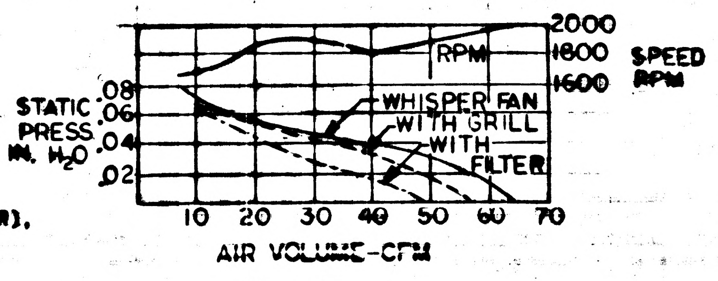
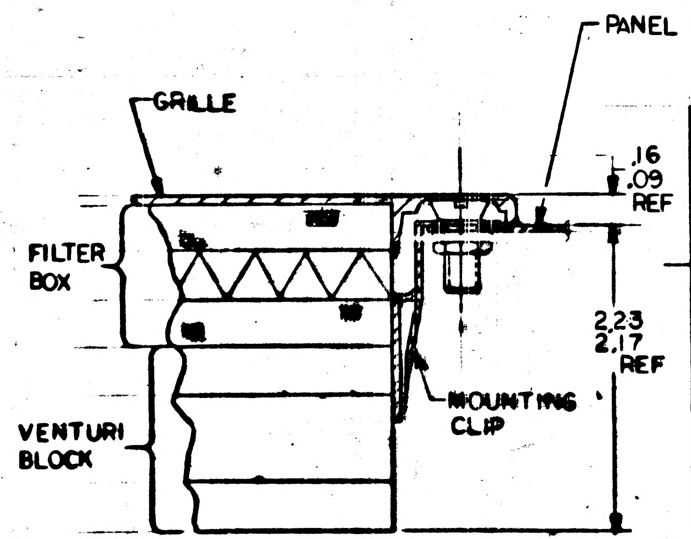


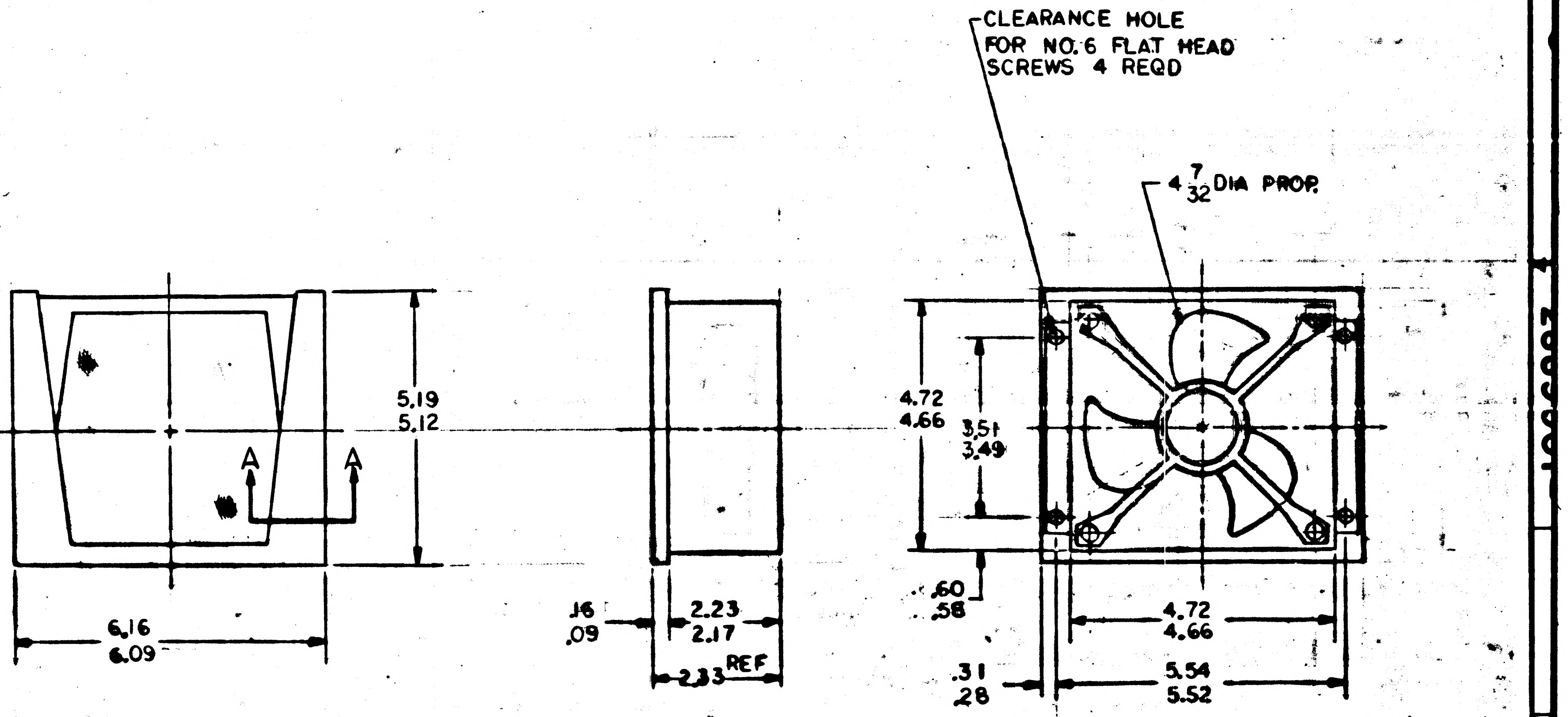
TABLE I

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 1603 DATE 6/19/63



SECTION AA
RECOMMENDED MOUNTING



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTE

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Ramirez 20 MAY 63
CHECKED J. Ruggiero
APPROVAL 6/6/63
APPROVAL
APPROVAL 6/6/63
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FAN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006883
SCALE NONE
WT
SHEET 1 OF 1

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 1603	4/19/63	
A	CLASS II CHANGE PER RD-R5292 Ray Wheeler CHK J. Ruggere APPD H Maynard	8/16/63	
B -	REVISED PER TDRR 08580 DR Ken Bell CHK Walkowicz APPD H Maynard	1/1/64	KEB
C	UPGRADED TO CLASS A WITH CHANGES PER TDRR 19935 DR J. Roper CHK R. Kirsten APPD H Maynard		11 Jul 65

Ⓜ

Ⓜ

Ⓓ

NOTES:

1. GENERAL REQUIREMENTS:
   - A. AIR VOLUME/STATIC PRESSURE: SEE FIGURE 1.
   - B. POWER REQUIRED: 8 WATTS MAXIMUM.
   - C. VOLTAGE: 115 VRMS ± 10%, 50-60 CPS, 1 PHASE.
   - D. SPEED, FREE RUNNING: 2000 RPM.
2. CONSTRUCTION:
   - A. FAN AND VENTURI BLOCK: PLASTIC AND ALUMINUM SKELETON FAN MOUNTED IN PLASTIC VENTURI BLOCK.
   - B. FILTER ASSEMBLY: FILTER ELEMENT, FILTER BOX (OR HOLDER), AND MOUNTING CLIPS.
   - C. BEARINGS: PRELUBRICATED SLEEVE BEARINGS.
   - D. FINGER GUARD MATERIAL: STEEL WITH ZINC COATING.
   - E. FINGER GUARD COLOR: SILVER.
3. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
4. THE ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NO. AND A -000 SUFFIX.

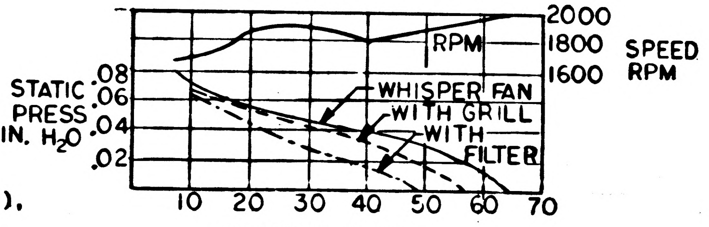
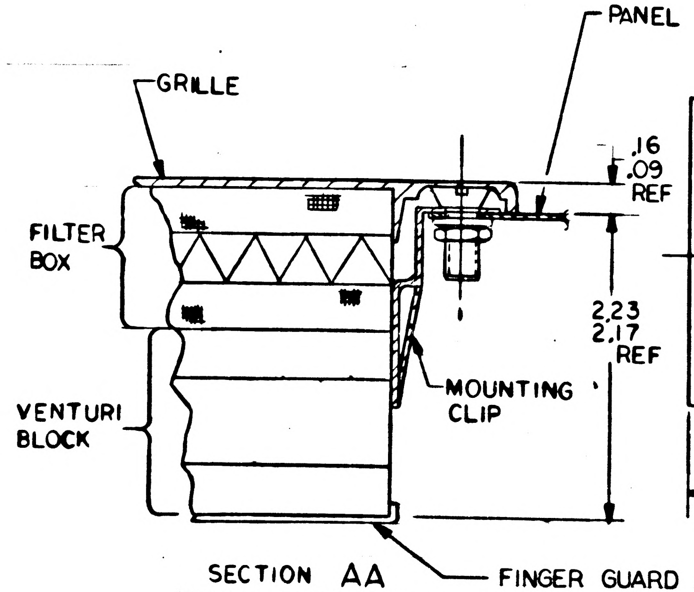
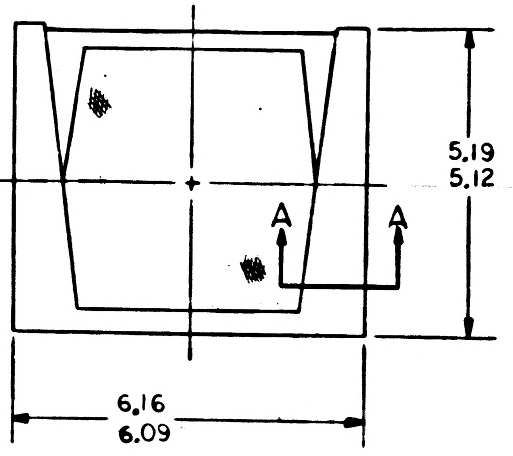


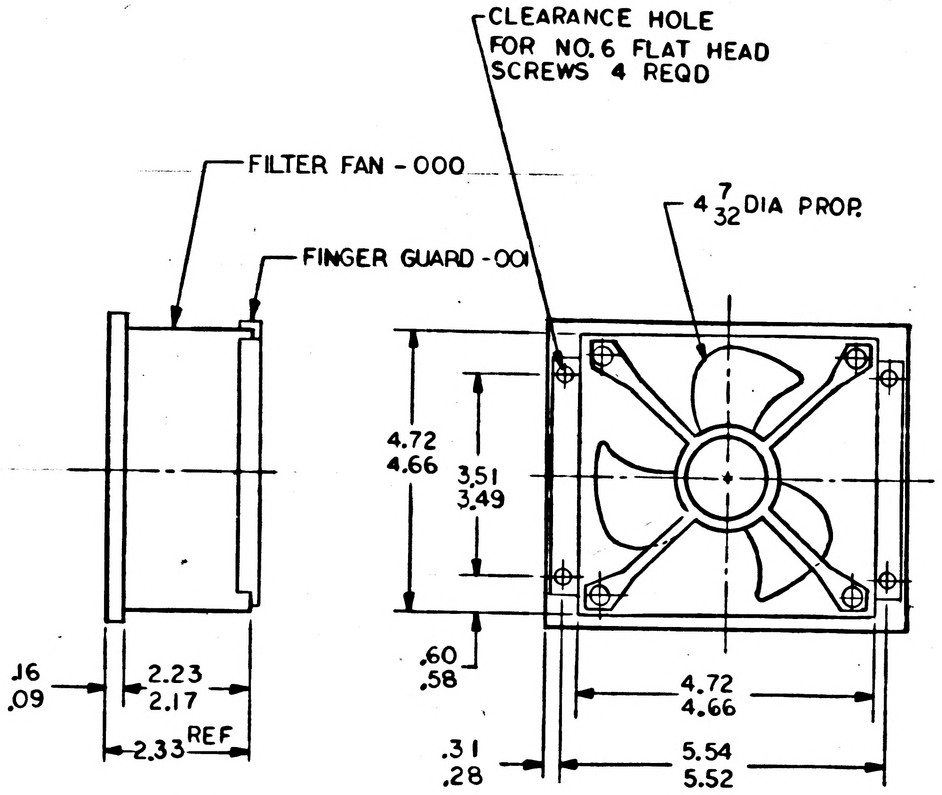
TABLE I

NOMENCLATURE	PART NO.
FILTER FAN	1006883-000
FINGER GUARD	1006883-001
FILTER FAN WITH FINGER GUARD	1006883-002



SECTION AA
RECOMMENDED MOUNTING





PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN H. Brunion DATE 17 MAY 63
CHECKED J. Ruggere / H. Maynard 29 MAY 63
APPROVAL 6/6/63
APPROVAL 6/6/63
APPROVAL 6/6/63
NASA APPROVAL 6/17
MIT APPROVAL
MIT APPROVAL 6/14/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FAN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO
49956	C	1006883

SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006883

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. AIR VOLUME/STATIC PRESSURE: SEE FIGURE 1.
   - B. POWER REQUIRED: 8 WATTS MAXIMUM.
   - C. VOLTAGE: 115 VRMS ± 10%, 50-60 CPS, 1 PHASE.
   - D. SPEED, FREE RUNNING: 2000 RPM.
2. CONSTRUCTION:
   - A. FAN AND VENTURI BLOCK: PLASTIC AND ALUMINUM SKELETON FAN MOUNTED IN PLASTIC VENTURI BLOCK.
   - B. FILTER ASSEMBLY: FILTER ELEMENT, FILTER BOX (OR HOLDER), AND MOUNTING CLIPS.
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   - D. FINGER GUARD MATERIAL: STEEL WITH ZINC COATING.
   - E. FINGER GUARD COLOR: SILVER.
3. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
4. THE ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NO. AND A -000 SUFFIX.

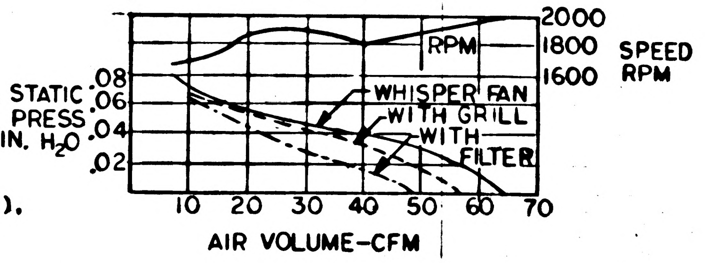

TABLE I

NOMENCLATURE	PART NO.
FILTER FAN	1006883-000
~~FINGER GUARD~~	~~1006883-001~~
~~FILTER FAN WITH FINGER GUARD~~	~~1006883-002~~

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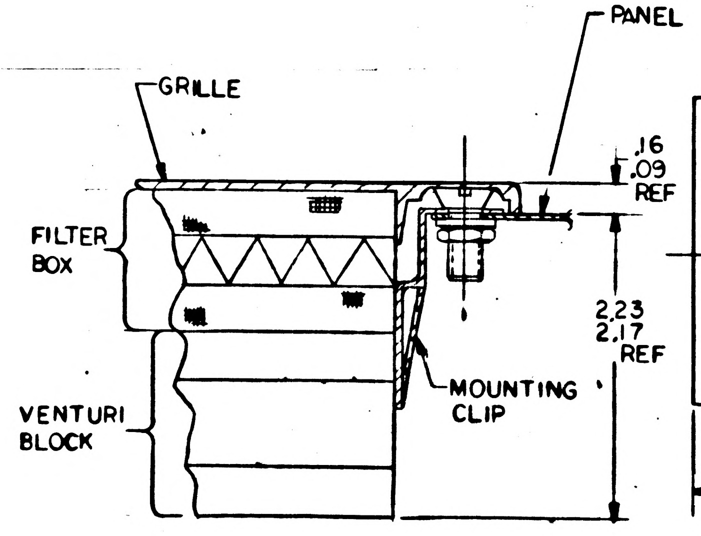
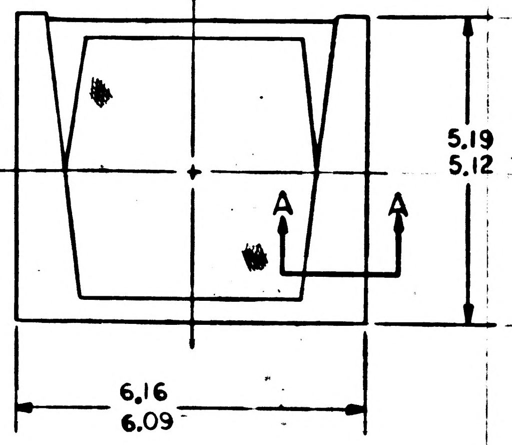
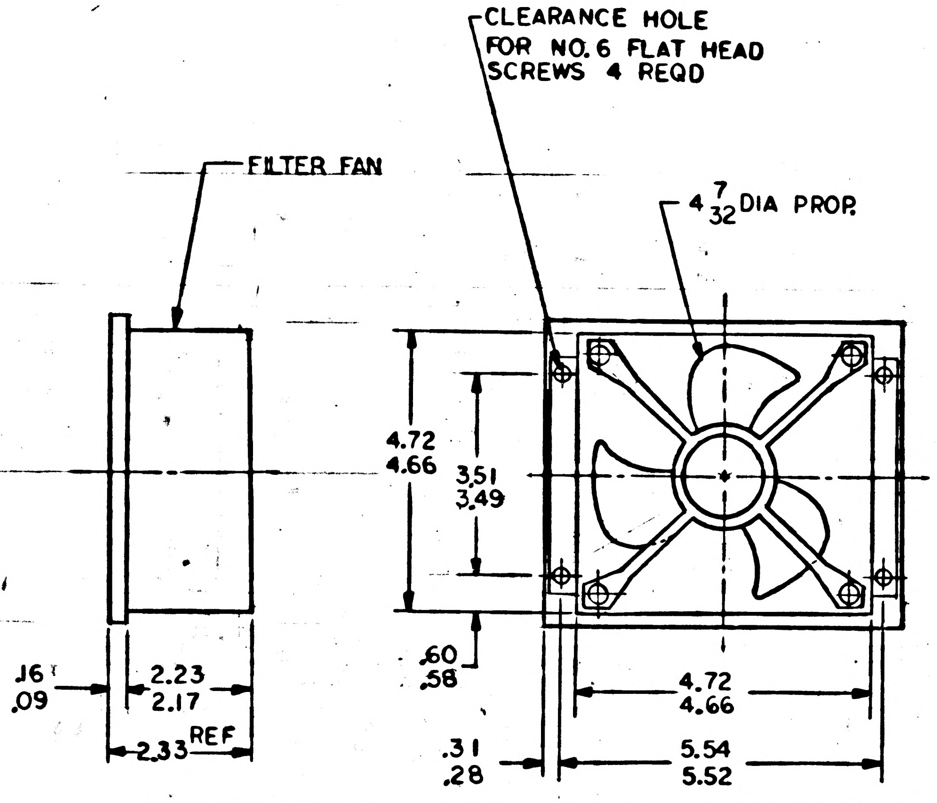
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 1603	6/19/63	[illegible]
A	CLASS II CHANGE PER RD-R5292 ~~Ray Wheeler~~ CHK J. Ruggen APPD A Maynard	8/16/63	JJS
B -	REVISED PER TDRR 08580 DR. Ken Bell CHK Walkowicz APPD A Maynard	1/1/64	KEB
C	UPGRADED TO-CLASS A WITH CHANGES PER TDRR 19935 DR J. Roper CHK R. Alberts APPD A Maynard	—	[illegible] 11 Jul 65
D	REVISED PER TDRR 24225 DR H Jones CHK A. Kupfer APPD A. Maynard	2 Dec 65	[illegible]



SECTION AA
RECOMMENDED MOUNTING





PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

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LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Brunner DATE 17 MAY 63
CHECKED J. Ruggen / H. Maynard 29 MAY 63
APPROVAL [illegible] 6/6/63
APPROVAL [illegible] 6/6/63
APPROVAL C. Spitzner 6/6/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL S. Sclamiero 6/14/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FAN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 49956
SIZE C
NASA DRAWING NO. 1006883
SCALE NONE
WT
SHEET 1 OF 1

1006883

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 1603	6/19/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. AIR VOLUME/STATIC PRESSURE: SEE FIGURE 1.
   - B. POWER REQUIRED: 8 WATTS MAXIMUM.
   - C. VOLTAGE: 115 VRMS ± 10%, 50-60 CPS, 1 PHASE.
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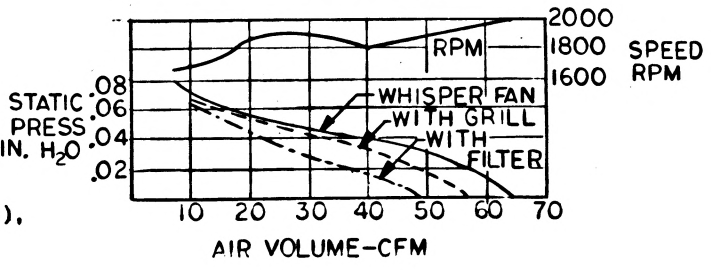
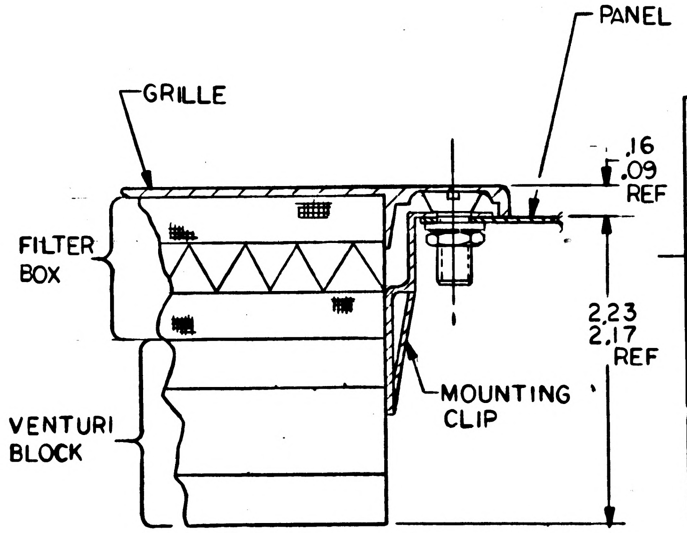


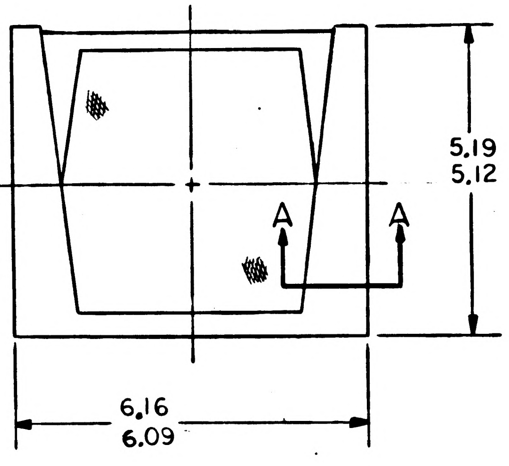
TABLE I

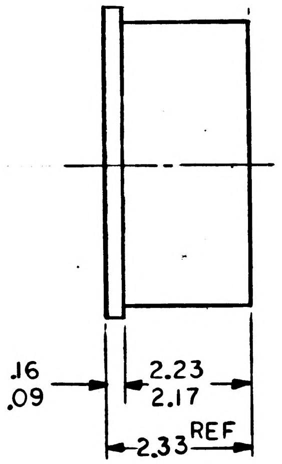
FOR INFORMATION ONLY

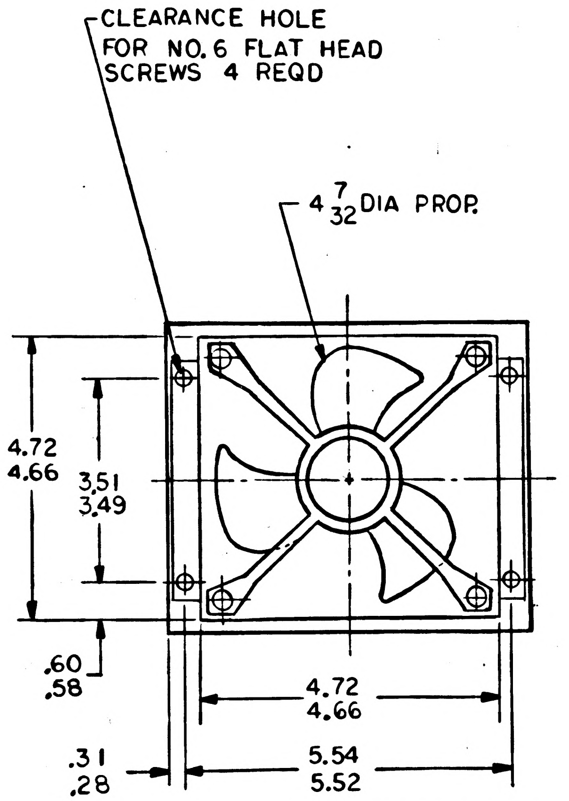
CLASS B RELEASE TDRR NO. 1603 DATE 6/19/63



SECTION AA
RECOMMENDED MOUNTING







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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
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RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 17 MAY 63
CHECKED 29 MAY 63
APPROVAL 6/6/63
APPROVAL 6/6/63
APPROVAL 6/6/63
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FAN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006883

SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED

NOTES:

1. GENERAL REQUIREMENTS:
   - A. ELECTRICAL CHARACTERISTICS:
     - (1) DC RESISTANCE (OHMS/1000 FT.): 1.24 MAXIMUM.
     - (2) SPARK TEST: 5.0 KILOVOLTS.
     - (3) DIELECTRIC STRENGTH: 3.0 KILOVOLTS MINIMUM.
     - (4) INSULATION RESISTANCE: 5000 MEGOHMS/1000 FEET, MINIMUM.
     - (5) DIELECTRIC CONSTANT: 2.2 MAXIMUM.
     - (6) POWER FACTOR AT 60 CPS: 0.005 MAXIMUM.
     - (7) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM.
     - (8) VOLTAGE RATING: 1000 VRMS.
   - B. OPERATING TEMPERATURE RANGE: -65°C TO +200°C.
   - C. MARKING PER MIL-STD-129 FOR REELS AND SHIPPING CONTAINERS SHALL INCLUDE THE ITEM DESCRIPTION, COLOR, MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA DRAWING NUMBER PLUS REVISION LETTER.
2. CONSTRUCTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) MATERIAL: SILVER PLATED COPPER CONDUCTOR WITH AN INSULATION OF POLYTETRAFLUOROETHYLENE (TFE).
     - (2) COLOR, INSULATION: GREY - INDIVIDUAL CONDUCTORS STRIPED BLACK, BROWN, RED, AND ORANGE. MIL-STD-104 FOR COLOR LIMITS.
   - B. CONSTRUCTION:
     - (1) EACH CONDUCTOR: NO. 10 AWG STRANDED CONDUCTOR, TEFLON INSULATED IN ACCORDANCE WITH MIL-W-16878/5.
     - (2) CABLE: FOUR CONDUCTORS TWISTED AND COVERED WITH WRAPPED TEFLON TAPE. OUTSIDE DIAMETER TO BE .400 MAXIMUM.
3. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01394 DATE 5/29/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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RAYTHEON CO
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Ray Wheeler DATE 27 Apr 63
CHECKED 2 May 63
APPROVAL
APPROVAL 17 May 63
APPROVAL 5/17/63
NASA APPROVAL
MIT APPROVAL 5/29/63
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
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CABLE, POWER, ELECTRICAL— 4 CONDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. ——— SIZE C NASA DRAWING NO. 1006885
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006885

INCHES
0 1 2
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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
A	CLASS II CHANGE PER RD-R5229 DR H. Prunier CHK 16 JUL 63, APPD H. Maynard 16 July 63	8/7/63	JJS
B	CLASS II CHANGE PER RD-R5287A, DR Ray Wheeler CHK J Ruggeri APPD H. Maynard	9/12/63	JJS
C	REVISED PER TDRR 04301 DR S. Chifice CHK APPD H. Maynard	12/10/63	

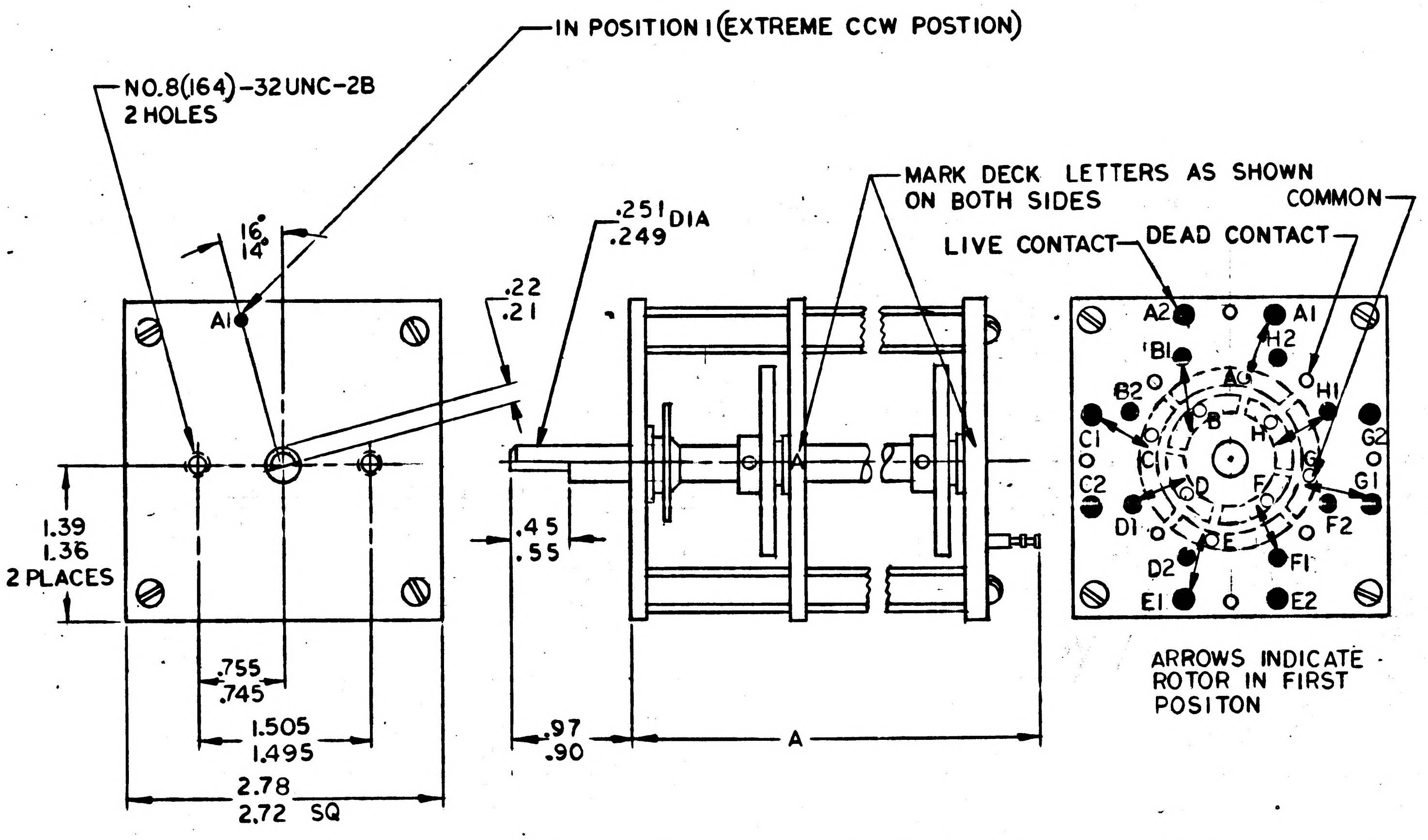
FOR INFORMATON ONLY
CLASS B RELEASE TDRR NO. 01454 DATE 6-5-63

TABLE I

DASH NUMBER	NUMBER OF DECKS	DIM A
-1	7	7.88 7.75
-2	1	1.50 1.37

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE EIGHT POLE, 2 POSITION, 30° INDEX, NON-SHORTING, ROTATION LIMITED TO 30° BY STOPS, AND FLATTED SHAFT.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 50 TO 375 INCH-OUNCES.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN Ray Wheeler DATE 8 May 63
CHECKED Rundell
APPROVAL C Sperling 27 MAY 63
APPROVAL 5/27/63
APPROVAL L.C. Spittler 5/27/63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL D. Solomon 5 Jun 63
MIT APPROVAL 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
2 POSITIONS / POLE, 8 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006886
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE EIGHT POLE, 2 POSITION, 30° INDEX, NON-SHORTING, ROTATION LIMITED TO 30° BY STOPS, AND FLATTED SHAFT.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 50 TO 375 INCH-OUNCES.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

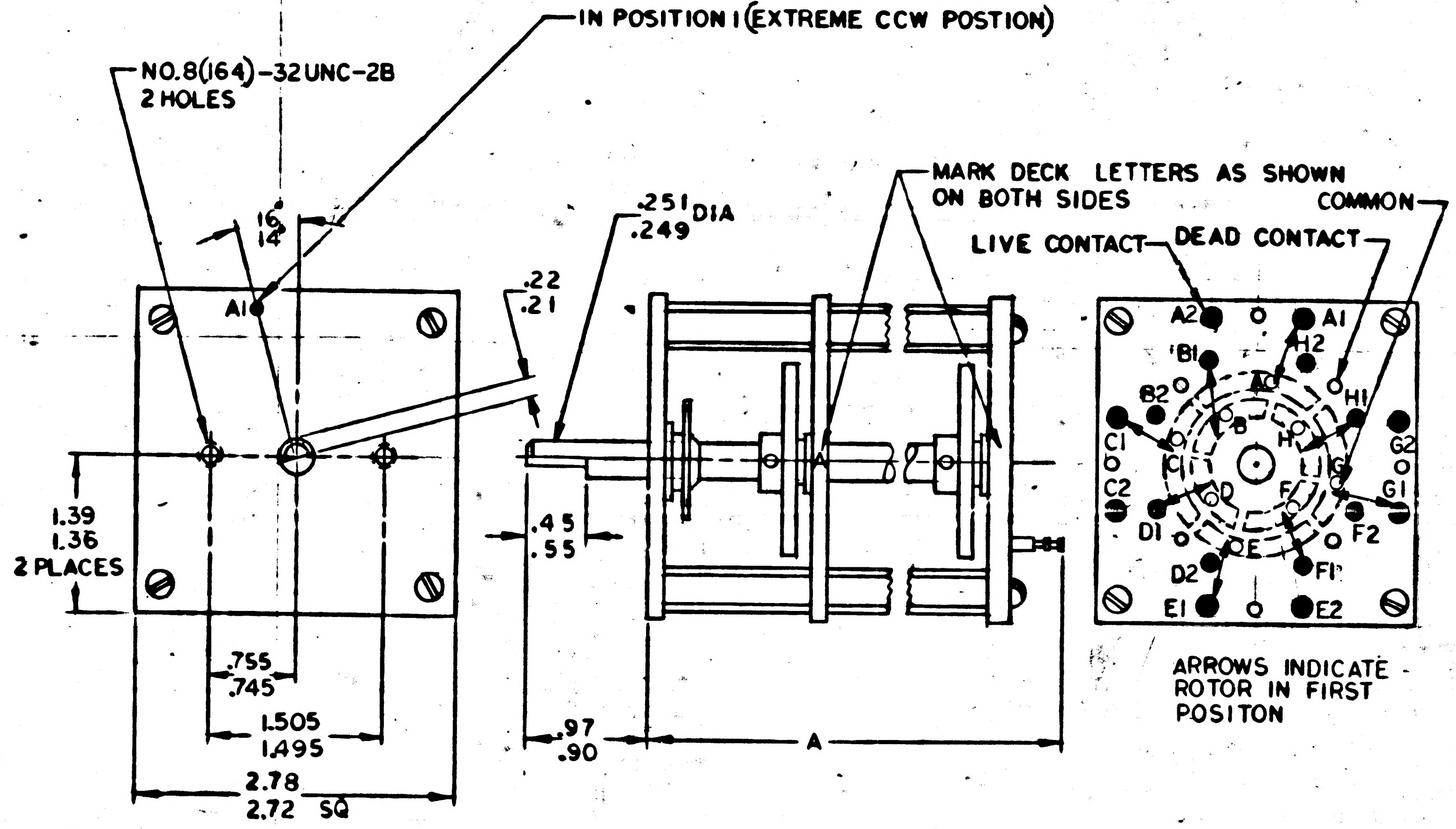
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

TABLE I

DASH NUMBER	NUMBER OF DECKS	DIM A
-1	7	7.88 7.75
-2	1	1.50 1.37

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
A	CLASS II CHANGE PER RD-R5229 DR H. Prunier CHK [illegible] 16 Jul 63. APPD H. Maynard 16 July 63	8/12/63	JJS
B	CLASS II CHANGE PER RD-R5287A. DR Ray Wheeler CHK J. Ruggeri APPD H. Maynard	9/12/63	JJS
C	REVISED PER TDRR 04301 DR S. Chifrice CHK [illegible] APPD H. Maynard	12/10/63	DH
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16748 DR P. Winfield CHK [illegible] APPD H. Maynard	7/1/65	HCB



ARROWS INDICATE ROTOR IN FIRST POSITON

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE ~~OR~~ DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Ray Wheeler DATE 8 May 63
CHECKED [illegible]
APPROVAL C Sparling 7 May 63
APPROVAL [illegible] 5/7/63
APPROVAL [illegible] 5/7/63
NASA APPROVAL W J [illegible] 6-5-63
MIT APPROVAL [illegible] 5 Jun 63
MIT APPROVAL [illegible] 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
2 POSITIONS / POLE, 8 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006886
SCALE NONE
WT
SHEET 1 OF 1

1006886

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED

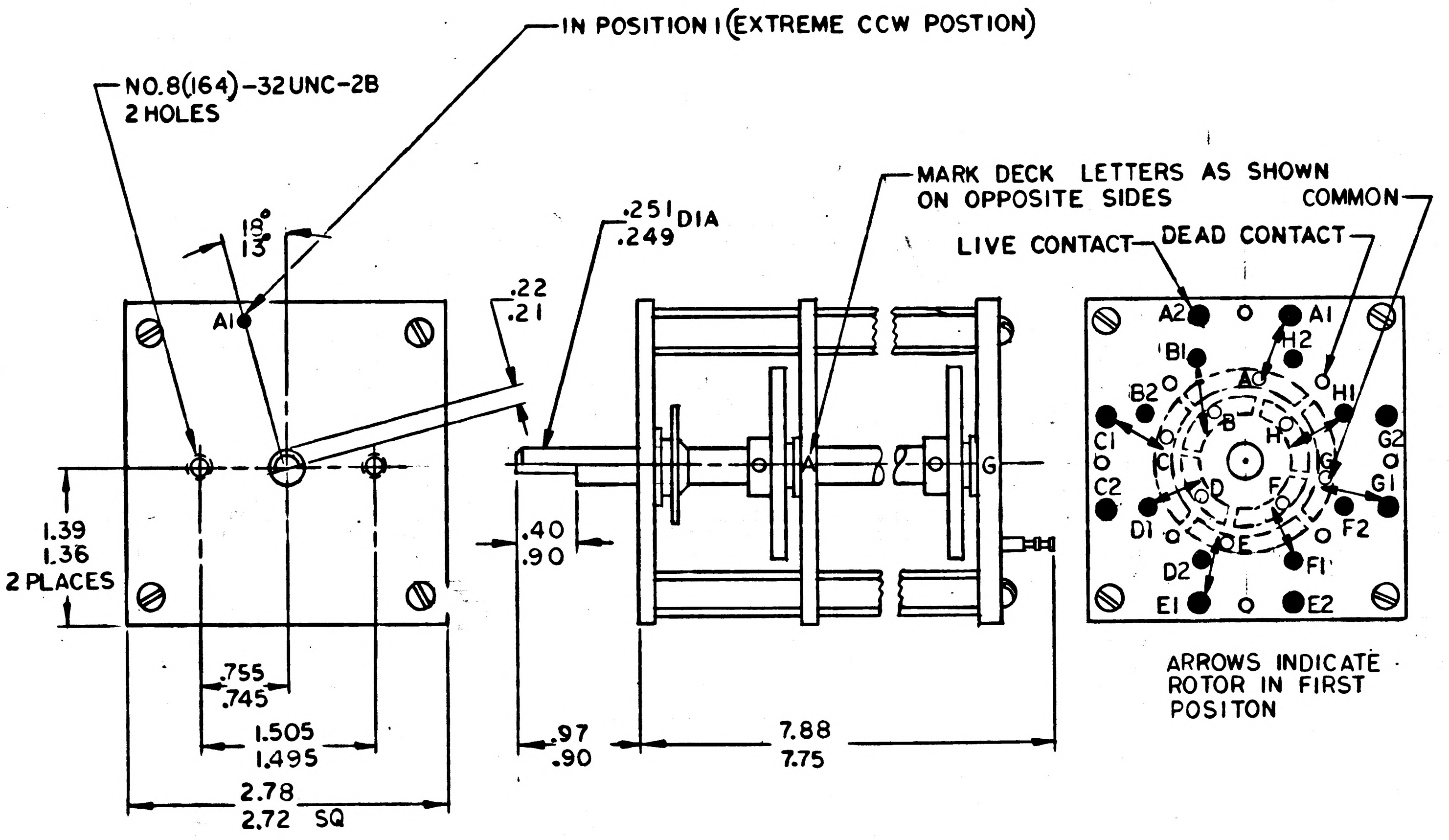
TABLE I

DASH NUMBER	NUMBER OF DECKS
-1	7

FOR INFORMATON ONLY
CLASS B RELEASE TDRR NO. 01454 DATE 6-5-63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE EIGHT POLE, 2 POSITION, 30° INDEX, NON-SHORTING, ROTATION LIMITED TO 30° BY STOPS, AND FLATTED SHAFT.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 50 TO 375 INCH-OUNCES.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED IN SEQUENCE, STARTING FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.



IN POSITION I (EXTREME CCW POSTION)
NO.8(164)-32UNC-2B
2 HOLES
15°
13°
A1
.22
.21
.251
.249
DIA
MARK DECK LETTERS AS SHOWN ON OPPOSITE SIDES
COMMON
LIVE CONTACT
DEAD CONTACT
1.39
1.36
2 PLACES
.40
.90
A
G
.755
.745
1.505
1.495
2.78
2.72 SQ
.97
.90
7.88
7.75
A2 A1 B1 H2 B2 H1 C1 C2 G2 G1 D1 F2 D2 F1 E1 E2
A B C D E F G H
ARROWS INDICATE ROTOR IN FIRST POSITON

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN Ray Wheeler DATE 8 May 63
CHECKED Rundell
APPROVAL C Sperling 27 MAY 63
APPROVAL W Dempsey 5/27/63
APPROVAL L.C. Spitten 5/27/63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL D. Scolamiero 5 Jun 63
MIT APPROVAL I Hagel 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
2 POSITIONS / POLE, 8 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. — SIZE C NASA DRAWING NO. 1006886
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. INPUT CURRENT AND DISSIPATION: 600 WATTS MAXIMUM INPUT, 320 W MAX INTERNAL DISSIPATION. 10 AMPERES TOTAL MAXIMUM CURRENT.
   - B. INPUT VOLTAGE: 105-135 VRMS AT EITHER 45-66 CPS OR 320-480 CPS. FREQUENCY SELECTED BY A SWITCH.
   - C. OPERATING AMBIENT TEMPERATURE RANGE: 0°C TO +50°C AT FULL LOAD CONTINUOUSLY.
   - D. STORAGE TEMPERATURE: -55°C TO +85°C.
   - E. INPUT AND OUTPUT CONNECTIONS: BARRIER TERMINAL BLOCK IN THE REAR OF CHASSIS.
   - F. METERS: RUGGEDIZED VOLTMETER AND AMMETER PER MIL-M-10304 FRONT PANEL MOUNTED.
   - G. CONTROLS:
     - (1) POWER: POWER ON-OFF SWITCH ON FRONT PANEL WITH INDICATOR LIGHT.
     - (2) OUTPUT CONTROLS: COARSE AND FINE VOLTAGE AND CURRENT ADJUSTMENT AT REAR OF UNIT.
     - (3) OPERATION MODE: SELECTOR SWITCH ON FRONT PANEL FOR "VOLTAGE REGULATED" OR "CURRENT REGULATED" WITH A SIGNAL LIGHT FOR AUTOMATIC DEPARTURE FROM MODE OF OPERATION.
     - (4) REMOTE SENSING: PROVISION FOR REMOTE SENSING TO ELIMINATE OUTPUT LEAD RESISTANCE EFFECT ON REGULATION
   - H. OVERLOAD PROTECTION:
     - (1) THERMAL: THERMOSTAT RESET BY TURNING POWER OFF.
     - (2) INTERNAL FAILURE: FUSE LOCATED ON REAR OF CHASSIS.
     - (3) EXTERNAL OVERLOAD: ADJUSTABLE, AUTOMATIC CURRENT-LIMITING CIRCUIT, INCLUDING SHORT CIRCUITS, FOR PRESET VALUES. FUSE ON REAR OF UNIT.
   - J. OUTPUT AND REGULATION (VOLTAGE REGULATED):
     - (1) REMOTE PROGRAMMING: 50 OHMS/VOLT OVER THE ENTIRE VOLTAGE RANGE.
     - (2) OUTPUT VOLTAGE AND CURRENT:
       - VOLTAGE RANGE: 0-36 VDC
       - CURRENT RANGE: 0-10 AMPS OVER ENTIRE VOLTAGE RANGE
       - INTERNAL IMPEDANCE: 2.0 MILLIOHMS MAXIMUM
     - (3) RIPPLE AND NOISE VOLTAGE: 0.5 MILLIVOLTS RMS MAXIMUM EITHER POSITIVE OR NEGATIVE GROUNDED.
     - (4) TEMPERATURE/VOLTAGE COEFFICIENT: 0.015%/°C MAXIMUM.
     - (5) REGULATION: LESS THAN 0.05% OR 8 MILLIVOLTS, WHICHEVER IS GREATER, FOR INPUT VARIATIONS FROM 105-135 VRMS OR LOAD VARIATIONS FROM 0 TO FULL LOAD.
     - (6) TRANSIENT RESPONSE, LINE: OUTPUT WITHIN REGULATION FOR ANY 15 VOLT LINE CHANGE WITHIN 105-135 VRMS.
     - (7) TRANSIENT RESPONSE, LOAD: OUTPUT CONSTANT WITHIN 25 MILLIVOLTS FOR LOAD CHANGE FROM 0-FULL OR FULL LOAD-0 WITHIN 50 MICROSECONDS.
   - K. OUTPUT AND REGULATION (CURRENT REGULATED):
     - (1) OUTPUT CURRENT AND VOLTAGE:
       - CURRENT RANGE: 1.0-10 AMP
       - VOLTAGE RANGE: 0-36 VDC OVER ENTIRE CURRENT RANGE
     - (2) RIPPLE AND NOISE CURRENT: 10 MILLIAMPS RMS MAXIMUM EITHER POSITIVE OR NEGATIVE GROUNDED.
     - (3) REGULATION: LESS THAN 0.2% OR 15 MILLIAMPERES, WHICHEVER IS GREATER, FOR INPUT VARIATIONS FROM 105-135 VRMS OR LOAD VARIATIONS FROM 0 TO RATED VOLTAGE.
   - L. MOUNTING: 30 INCH RACK MOUNTING.
   - M. PANEL MATERIAL: .185/.195 THK ALUMINUM PER QQ-A-327.
   - N. FINISH, PANEL (FRONT AND EDGES): PAINT 1 COAT OF TT-E-529 LIGHT GREY CLASS B SEMIGLOSS ENAMEL, COLOR NO. 26440 OF FED-STD-595, IN ACCORDANCE WITH MIL-F-14072, P 513 TYPE I EXCEPT THAT MIL-C-5541 CHROMATE FILM SHALL BE ELECTRICALLY CONDUCTIVE.
   - P. MANUFACTURER'S NAMEPLATE, IDENTIFICATION OF UNIT, ADDRESS, TRADEMARK, ETC, TO APPEAR ON REAR OF UNIT TOGETHER WITH THE NASA DRAWING NUMBER AND REVISION LETTER. (THIS INFORMATION NOT TO APPEAR ON FRONT PANEL).
   - R. FRONT PANEL MARKING: SILK SCREEN .12 & .19 HIGH BLACK CHARACTERS & .03 WIDE LINES PER ND 1002019 UNLESS OTHERWISE SPECIFIED.
2. FRONT PANEL HARDWARE TO BE CROSS RECESSED MS 35200, FLAT HEAD, WHERE POSSIBLE. PAN HEAD TO BE MS 35216.
3. CONTROL KNOBS TO BE PER MS 91528, BLACK MATTE FINISH, WHERE POSSIBLE.
4. UNITS SHALL BE FURNISHED WITH TWO COPIES OF AN OPERATING AND INSTRUCTION MANUAL INCLUDING SCHEMATIC.

ORIGINAL SOURCE OF SUPPLY:

LAMBDA ELECTRONICS CORP.
HUNTINGTON, N.Y.
CODE IDENT NO. 80103
MODEL NO. LE-102M (AS MODIFIED ABOVE)

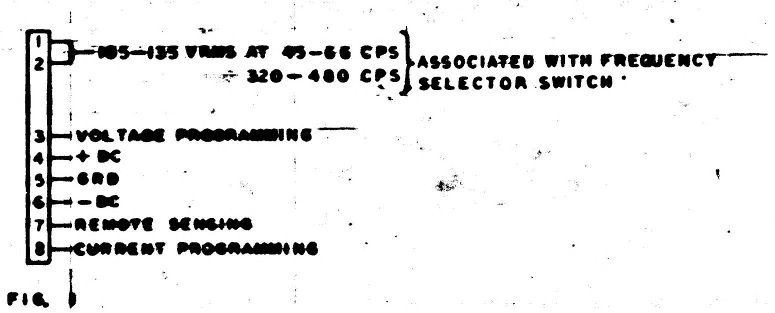

1
2
105–135 VRMS AT 45–66 CPS
320–480 CPS
ASSOCIATED WITH FREQUENCY SELECTOR SWITCH
3 VOLTAGE PROGRAMMING
4 + DC
5 GRD
6 – DC
7 REMOTE SENSING
8 CURRENT PROGRAMMING

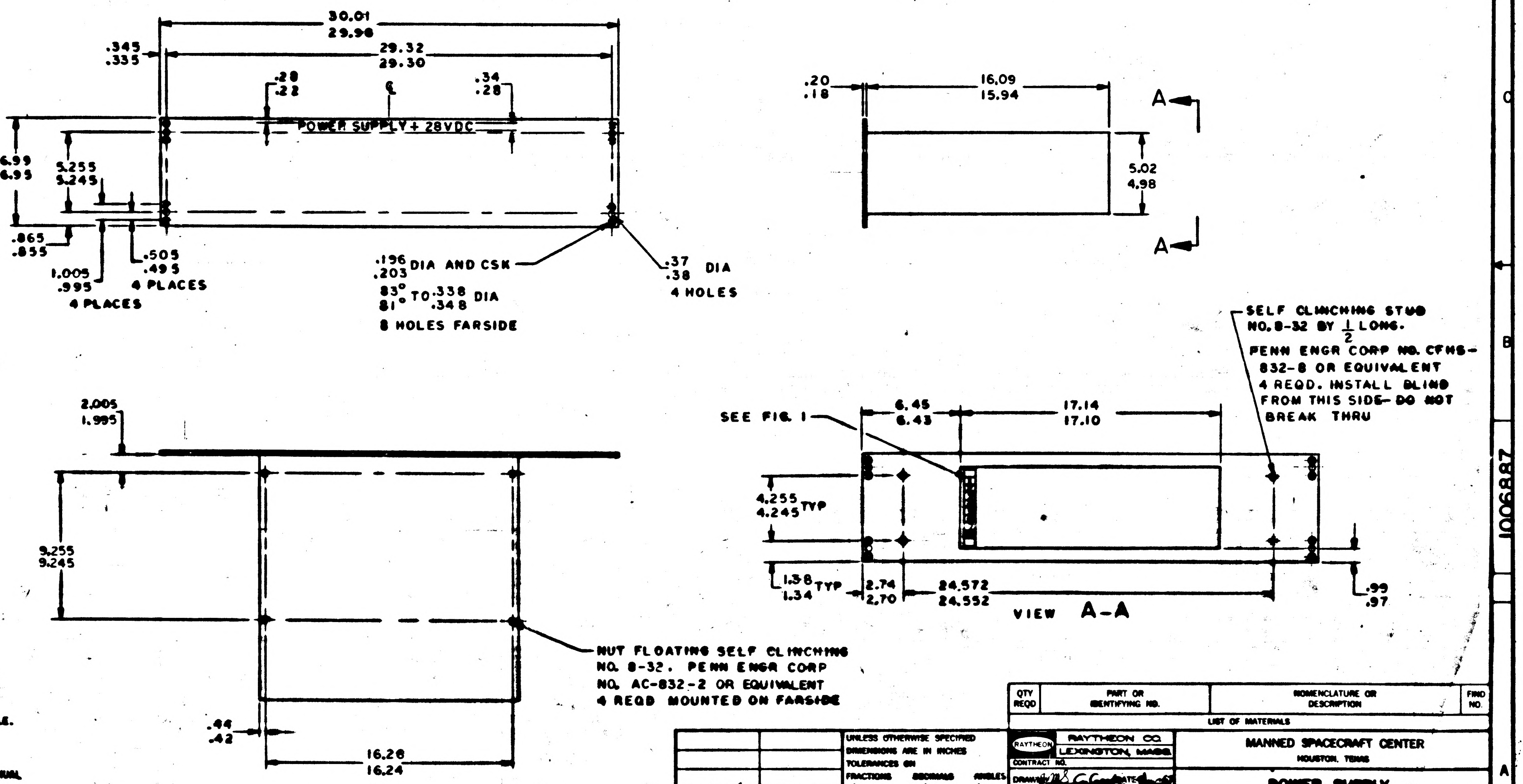
FIG. 1

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5310 DR C. Crespi CHK J. Ruggeri APPD	9-5-63	
B	CLASS II CHANGE PER RD-R5478 DR CHK J. Ruggeri APPD H. Maynard	10-15-63	
C	REVISED PER TDRR 08546 DR CHK APPD H. Maynard	6/1/64	KEB

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02301 DATE 7/31/63


30.01
29.98
29.32
29.30
.345
.335
.28
.22
.34
.28
℄
POWER SUPPLY + 28VDC
6.99
6.95
5.255
5.245
.865
.855
1.005
.995
4 PLACES
.505
.495
4 PLACES
.196
.203
DIA AND CSK
83°
81°
TO .338
.348
DIA
8 HOLES FARSIDE
.37
.38
DIA
4 HOLES
.20
.18
16.09
15.94
A
5.02
4.98
A
SELF CLINCHING STUD NO. 8-32 BY 1/2 LONG.
PENN ENGR CORP NO. CFHS-832-8 OR EQUIVALENT
4 REQD. INSTALL BLIND FROM THIS SIDE– DO NOT BREAK THRU
SEE FIG. 1
6.45
6.43
17.14
17.10
4.255
4.245 TYP
1.38
1.34 TYP
2.74
2.70
24.572
24.552
.99
.97
VIEW A-A
2.005
1.995
9.255
9.245
.44
.42
16.28
16.24
NUT FLOATING SELF CLINCHING NO. 8-32. PENN ENGR CORP NO. AC-832-2 OR EQUIVALENT 4 REQD MOUNTED ON FARSIDE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN C. Crespi DATE
CHECKED J. Ruggeri
APPROVAL
APPROVAL 7/1/63
APPROVAL 7/1/63
NASA APPROVAL
MIT APPROVAL 7-31-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
CONSTANT CURRENT/VOLTAGE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006887
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

1006887

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED

NOTES:

1. **GENERAL REQUIREMENTS:**
   - A. INPUT CURRENT AND DISSIPATION: 680 WATTS MAXIMUM INPUT, 320 W MAX INTERNAL DISSIPATION. 10 AMPERES TOTAL MAXIMUM CURRENT.
   - B. INPUT VOLTAGE: 105-135 VRMS AT EITHER 45-66 CPS OR 320-480 CPS. FREQUENCY SELECTED BY A SWITCH.
   - C. OPERATING AMBIENT TEMPERATURE RANGE: 0°C TO +50°C AT FULL LOAD CONTINUOUSLY.
   - D. STORAGE TEMPERATURE: -55°C TO +85°C.
   - E. INPUT AND OUTPUT CONNECTIONS: BARRIER TERMINAL BLOCK IN THE REAR OF CHASSIS.
   - F. METERS: RUGGEDIZED VOLTMETER AND AMMETER PER MIL-M-10304 FRONT PANEL MOUNTED.
   - G. CONTROLS:
     - (1) POWER: POWER ON-OFF SWITCH ON FRONT PANEL WITH INDICATOR LIGHT.
     - (2) OUTPUT CONTROLS: COARSE AND FINE VOLTAGE AND CURRENT ADJUSTMENT AT REAR OF UNIT.
     - (3) OPERATION MODE: SELECTOR SWITCH ON FRONT PANEL FOR "VOLTAGE REGULATED" OR "CURRENT REGULATED" WITH A SIGNAL LIGHT FOR AUTOMATIC DEPARTURE FROM MODE OF OPERATION.
     - (4) REMOTE SENSING: PROVISION FOR REMOTE SENSING TO ELIMINATE OUTPUT LEAD RESISTANCE EFFECT ON REGULATION
   - H. OVERLOAD PROTECTION:
     - (1) THERMAL: THERMOSTAT RESET BY TURNING POWER OFF.
     - (2) INTERNAL FAILURE: FUSE LOCATED ON REAR OF CHASSIS.
     - (3) EXTERNAL OVERLOAD: ADJUSTABLE, AUTOMATIC CURRENT-LIMITING CIRCUIT, INCLUDING SHORT CIRCUITS, FOR PRESET VALUES. FUSE ON REAR OF UNIT.
   - J. OUTPUT AND REGULATION (VOLTAGE REGULATED):
     - (1) REMOTE PROGRAMMING: 50 OHMS/VOLT OVER THE ENTIRE VOLTAGE RANGE.
     - (2) OUTPUT VOLTAGE AND CURRENT:
       - VOLTAGE RANGE: 0-36 VDC
       - CURRENT RANGE: 0-10 AMPS OVER ENTIRE VOLTAGE RANGE
       - INTERNAL IMPEDANCE: 2.0 MILLIOHMS MAXIMUM
     - (3) RIPPLE AND NOISE VOLTAGE: 0.5 MILLIVOLTS RMS MAXIMUM EITHER POSITIVE OR NEGATIVE GROUNDED.
     - (4) TEMPERATURE/VOLTAGE COEFFICIENT: 0.015%/°C MAXIMUM.
     - (5) REGULATION: LESS THAN 0.05% OR 8 MILLIVOLTS, WHICHEVER IS GREATER, FOR INPUT VARIATIONS FROM 105-135 VRMS OR LOAD VARIATIONS FROM 0 TO FULL LOAD.
     - (6) TRANSIENT RESPONSE, LINE: OUTPUT WITHIN REGULATION FOR ANY 15 VOLT LINE CHANGE WITHIN 105-135 VRMS.
     - (7) TRANSIENT RESPONSE, LOAD: OUTPUT CONSTANT WITHIN 25 MILLIVOLTS FOR LOAD CHANGE FROM 0-FULL OR FULL LOAD-0 WITHIN 50 MICROSECONDS.
   - K. OUTPUT AND REGULATION (CURRENT REGULATED):
     - (1) OUTPUT CURRENT AND VOLTAGE:
       - CURRENT RANGE: 1.0-10 AMP
       - VOLTAGE RANGE: 0-36 VDC OVER ENTIRE CURRENT RANGE
     - (2) RIPPLE AND NOISE CURRENT: 10 MILLIAMPS RMS MAXIMUM EITHER POSITIVE OR NEGATIVE GROUNDED.
     - (3) REGULATION: LESS THAN 0.2% OR 15 MILLIAMPERES, WHICHEVER IS GREATER, FOR INPUT VARIATIONS FROM 105-135 VRMS OR LOAD VARIATIONS FROM 0 TO RATED VOLTAGE.
   - L. MOUNTING: 30 INCH RACK MOUNTING.
   - M. PANEL MATERIAL: .185/.195 THK ALUMINUM PER QQ-A-327.
   - N. FINISH, PANEL (FRONT AND EDGES): PAINT 1 COAT OF TT-E-529 LIGHT GREY CLASS B SEMIGLOSS ENAMEL, COLOR NO. 26440 OF FED-STD-595, IN ACCORDANCE WITH MIL-F-14072, P 513 TYPE I EXCEPT THAT MIL-C-5541 CHROMATE FILM SHALL BE ELECTRICALLY CONDUCTIVE.
   - P. MANUFACTURER'S NAMEPLATE, IDENTIFICATION OF UNIT, ADDRESS, TRADEMARK, ETC, TO APPEAR ON REAR OF UNIT TOGETHER WITH THE NASA DRAWING NUMBER AND REVISION LETTER. (THIS INFORMATION NOT TO APPEAR ON FRONT PANEL).
   - R. FRONT PANEL MARKING: SILK SCREEN .12 & .19 HIGH BLACK CHARACTERS & .03 WIDE LINES PER ND 1002019 UNLESS OTHERWISE SPECIFIED.
2. FRONT PANEL HARDWARE TO BE CROSS RECESSED MS 35200, FLAT HEAD, WHERE POSSIBLE. PAN HEAD TO BE MS 35216.
3. CONTROL KNOBS TO BE PER MS 91528B, BLACK MATTE FINISH, WHERE POSSIBLE.
4. UNITS SHALL BE FURNISHED WITH TWO COPIES OF AN OPERATING AND INSTRUCTION MANUAL INCLUDING SCHEMATIC.

ORIGINAL SOURCE OF SUPPLY:

LAMBDA ELECTRONICS CORP.
HUNTINGTON, N.Y.
CODE IDENT NO. 80103
MODEL NO. LE-102M (AS MODIFIED ABOVE)

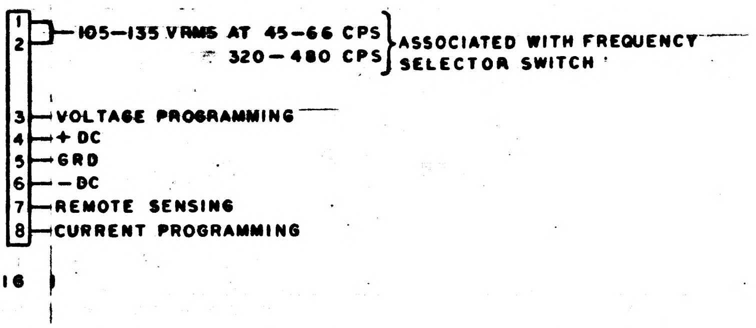
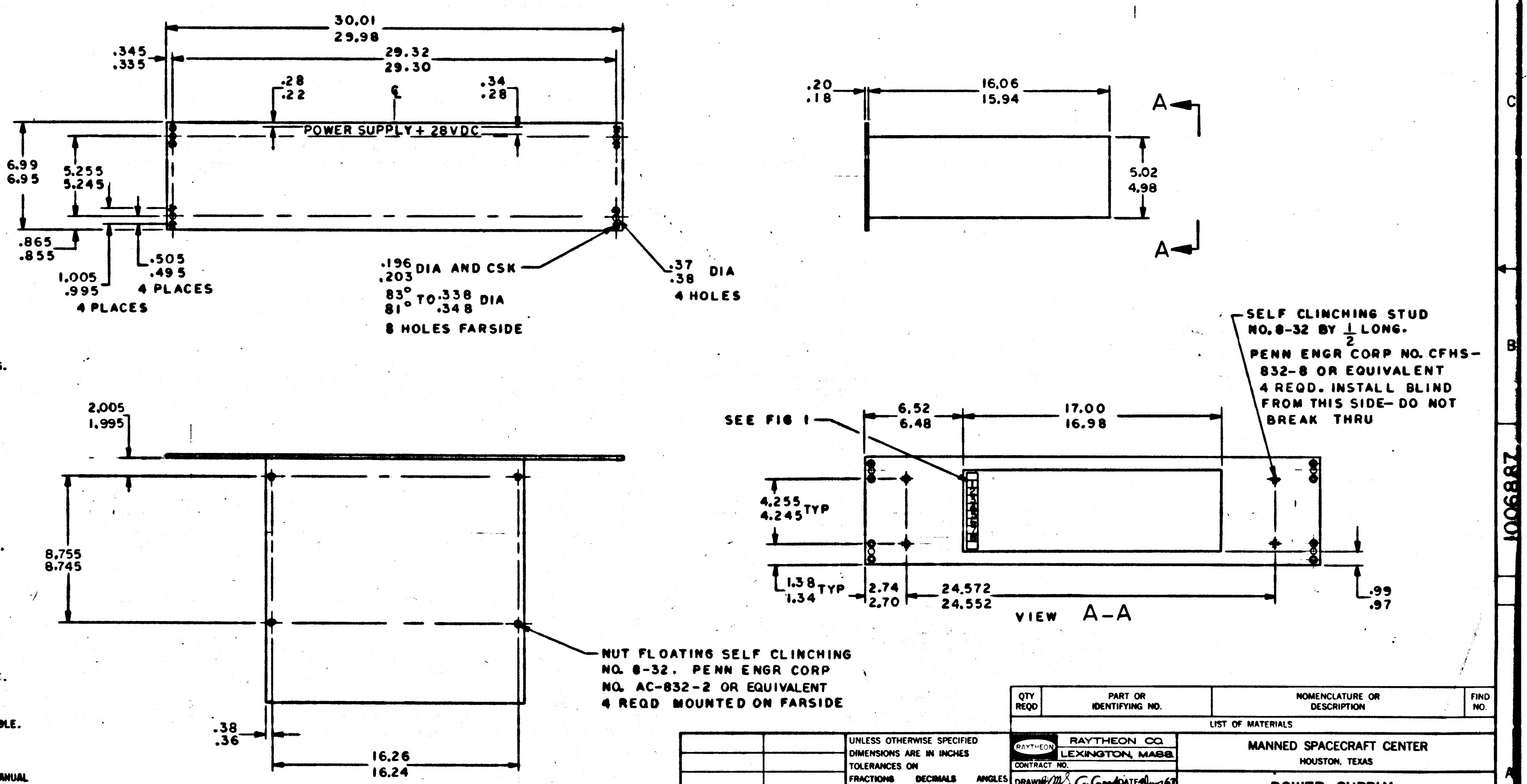

1
2
105—135 VRMS AT 45—66 CPS
320—480 CPS
ASSOCIATED WITH FREQUENCY SELECTOR SWITCH
3 VOLTAGE PROGRAMMING
4 + DC
5 GRD
6 — DC
7 REMOTE SENSING
8 CURRENT PROGRAMMING

FIG 1

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02301 DATE 7/31/63


30.01
29.98
29.32
29.30
.345
.335
.28
.22
.34
.28
POWER SUPPLY + 28VDC
6.99
6.95
5.255
5.245
.865
.855
1.005
.995
4 PLACES
.505
.495
4 PLACES
.196
.203 DIA AND CSK
83°
81° TO .338
.348 DIA
8 HOLES FARSIDE
.37
.38 DIA
4 HOLES
.20
.18
16.06
15.94
A
A
5.02
4.98
2.005
1.995
8.755
8.745
.38
.36
16.26
16.24
NUT FLOATING SELF CLINCHING NO. 8-32. PENN ENGR CORP NO. AC-832-2 OR EQUIVALENT 4 REQD MOUNTED ON FARSIDE
SEE FIG 1
6.52
6.48
17.00
16.98
SELF CLINCHING STUD NO. 8-32 BY 1/2 LONG. PENN ENGR CORP NO. CFHS-832-8 OR EQUIVALENT 4 REQD. INSTALL BLIND FROM THIS SIDE- DO NOT BREAK THRU
4.255
4.245 TYP
1.38
1.34 TYP
2.74
2.70
24.572
24.552
.99
.97
VIEW A-A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN M. S. C. DATE 7 June 63
CHECKED
APPROVAL 7/16/63
APPROVAL 7/16/63
APPROVAL 7/16/63
NASA APPROVAL 7-31-63
MIT APPROVAL 7/31/63
MIT APPROVAL 31 July 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
CONSTANT CURRENT/VOLTAGE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1006887
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1006887

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J Ruggeri APPD H Maynard	9/12/63	JGB
B	REVISED PER TDRR 04301 DR S. Crifice CHK PJ Rogers APPD H. Maynard	12/16/63	

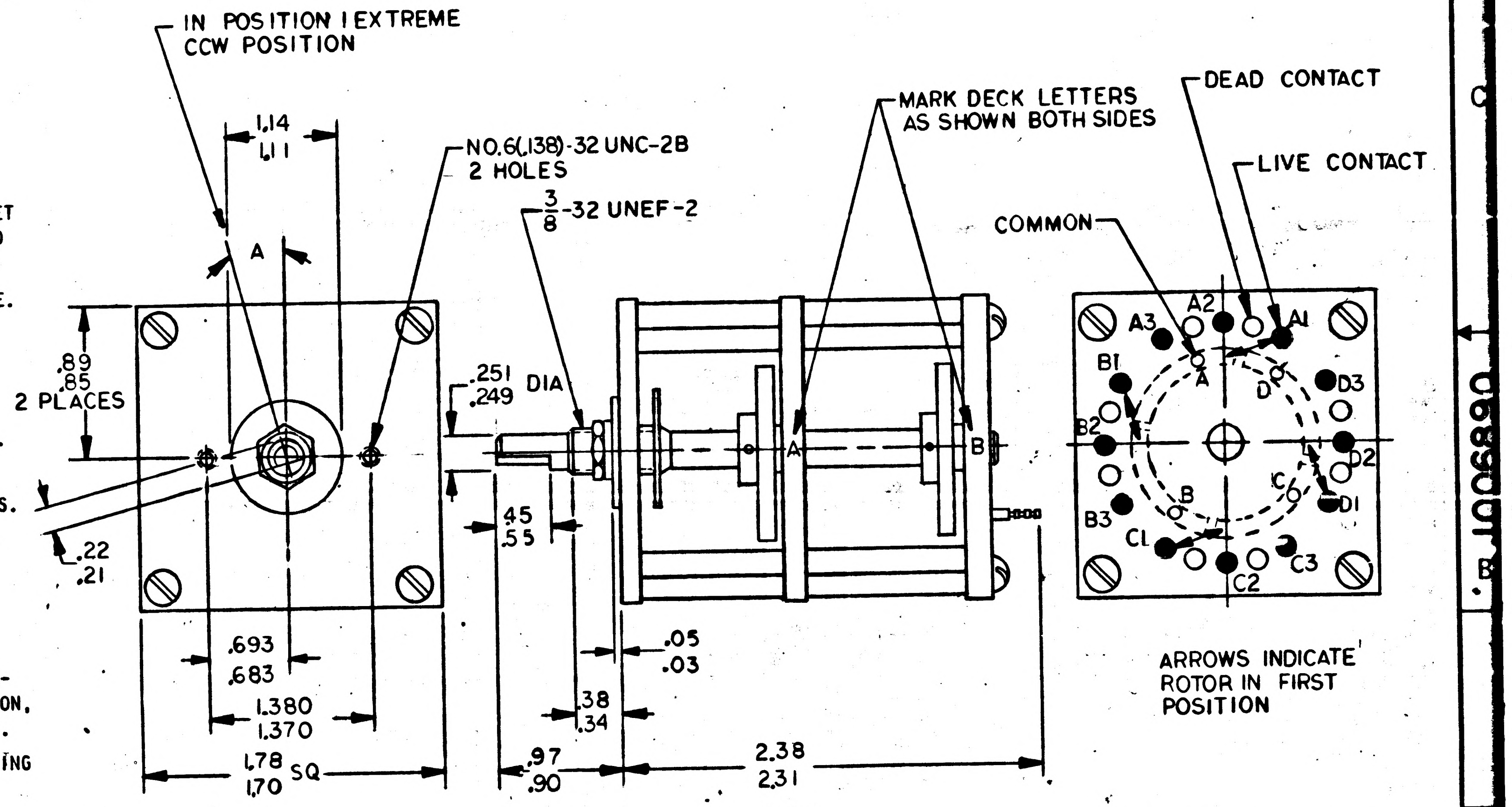
FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01454 DATE 6-5-63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 3 POSITION WITH ADJUSTABLE STOP PRESET AS SPECIFIED IN TABLE I, 30° INDEX, NON-SHORTING, ROTATION LIMITED BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 20 TO 112 INCH-OUNCES, MAXIMUM.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

TABLE I

DASH NUMBER	NO. OF POSITIONS	NO. OF DECKS	A DEGREES
-1	2	2	15°
-2	3	2	30°



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY. REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.

DRAWN Ray Wheeler DATE 7 May 63
CHECKED D Lindell
APPROVAL C S Rowling 27 MAY 63
APPROVAL A Dempsey 5/27/63
APPROVAL L. C. Spittman 5/27/63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL D. Sedomisse 5 June 63
MIT APPROVAL L Wahl 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
3 POSITIONS / POLE, 4 POLES / DECK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006890
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
–	CLASS B RELEASE PER TDRR 01454		
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD H. Maynard	7/16/63	
B	REVISED PER TDRR 04301 DR S. Arifice CHK PJ Rogers APPD H. Maynard	12/16/63	
C	REVISED PER TDRR 06340 DR R. DiGloria CHK A. Caggiano APPD H. Maynard	3/10/64	WK
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17078 DR J.P. Leonard CHK	3/27/6-	KGS

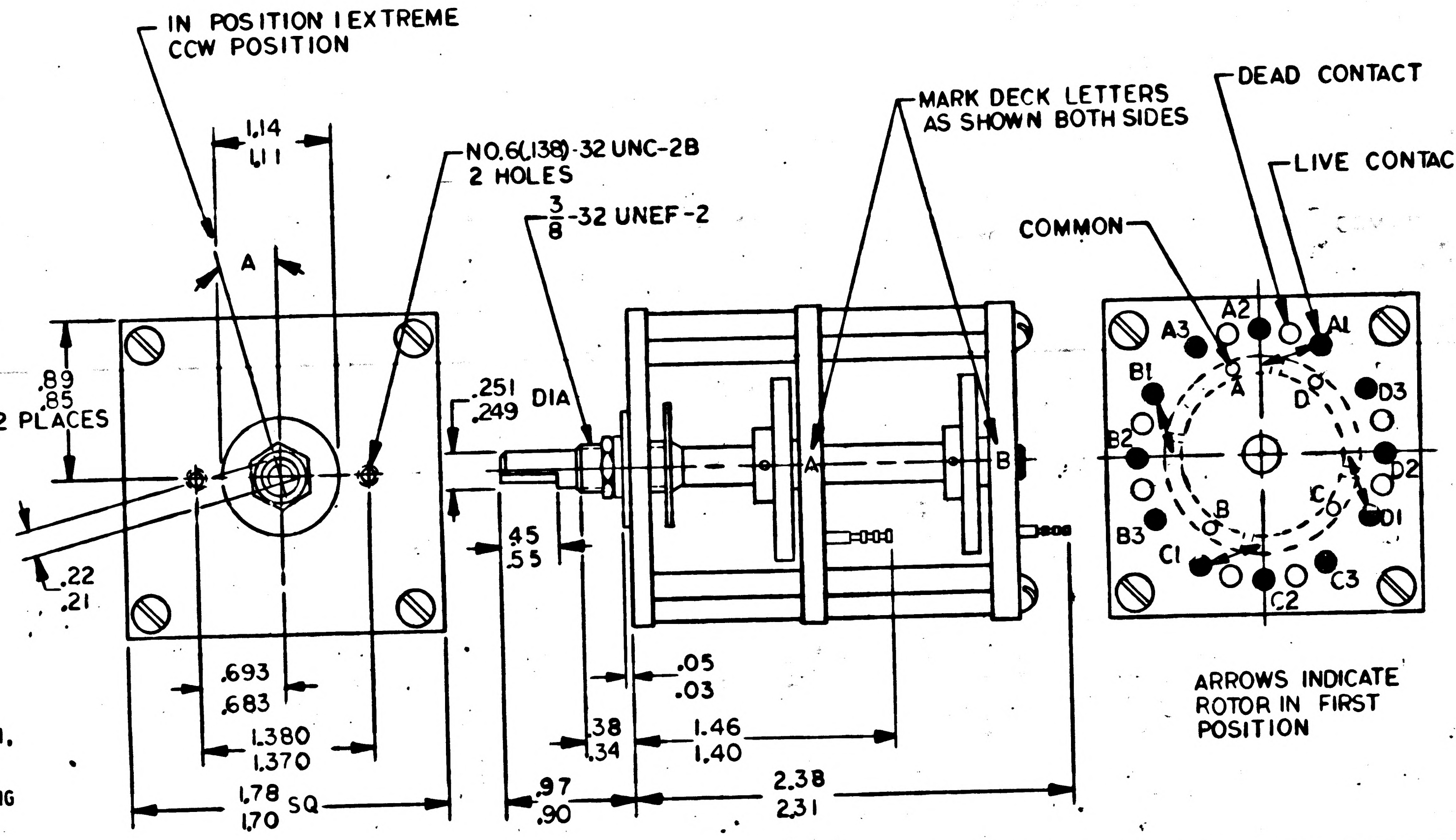
TABLE I

DASH NUMBER	NO. OF POSITIONS	NO. OF DECKS	A DEGREES
-1	2	2	15°
-2	3	2	30°
-3	3	1	30°

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 3 POSITION WITH ADJUSTABLE STOP PRESET AS SPECIFIED IN TABLE I, 30° INDEX, NON-SHORTING, ROTATION LIMITED BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 20 TO 112 INCH-OUNCES, MAXIMUM.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM SHAFT END.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



QTY. REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN Ray Wheeler DATE 7 May 63
CHECKED
APPROVAL 27 MAY 63
APPROVAL 5/27/63
APPROVAL 5/27/63
NASA APPROVAL 6-5-63
MIT APPROVAL
MIT APPROVAL 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
3 POSITIONS / POLE, 4 POLES / DECK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006890
SCALE NONE
WT
SHEET 1 OF 1

1006890

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 30° INDEX, NON-SHORTING, FLATTED SHAFT, FOUR POSITIONS, STOPS AND DECKS SEE TABLE I.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 20 TO 112 INCH-OUNCES, MAXIMUM.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM SHAFT END.

~~3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~

4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDOR'S LIST.

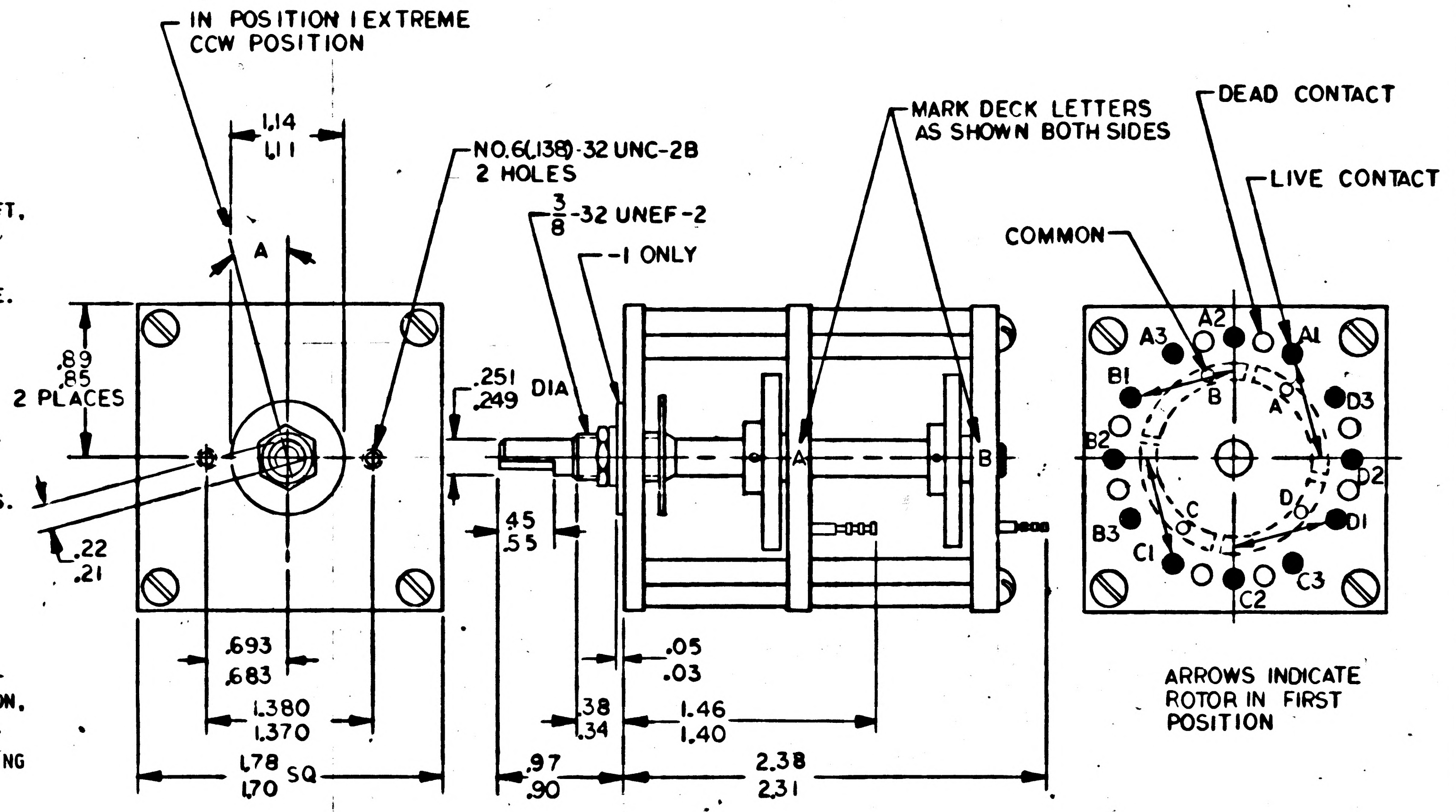
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

TABLE I

DASH NUMBER	NO. OF POSITIONS	NO. OF DECKS	A DEGREES	ADJ STOPS
-1	2	2	15°	YES
-2	3	2	30°	NO
-3	3	1	30°	NO

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 01454		
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J Ruggeri APPD H Maynard	9/12/63	
B	REVISED PER TDRR 04301 DR S. Orifice CHK APPD H Maynard	12/16/63	
C	REVISED PER TDRR 06340 DR R. DiGlen CHK A. Cappiano APPD H. Maynard	3/10/64	WK
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17078 DR J.P. Leonard CHK APPD H Maynard	3/24/65	KGS
E	REVISED PER TDRR 18252 DR H Wong CHK APPD H Maynard	19 Aug 65	



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.

DRAWN Ray Wheeler DATE 7 May 63
CHECKED
APPROVAL 7 MAY 63
APPROVAL
APPROVAL
NASA APPROVAL 6-5-63
MIT APPROVAL D. 5 June 63
MIT APPROVAL 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
3 POSITIONS / POLE, 4 POLES / DECK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006890
SCALE NONE
WT
SHEET 1 OF 1

1006890 B

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED

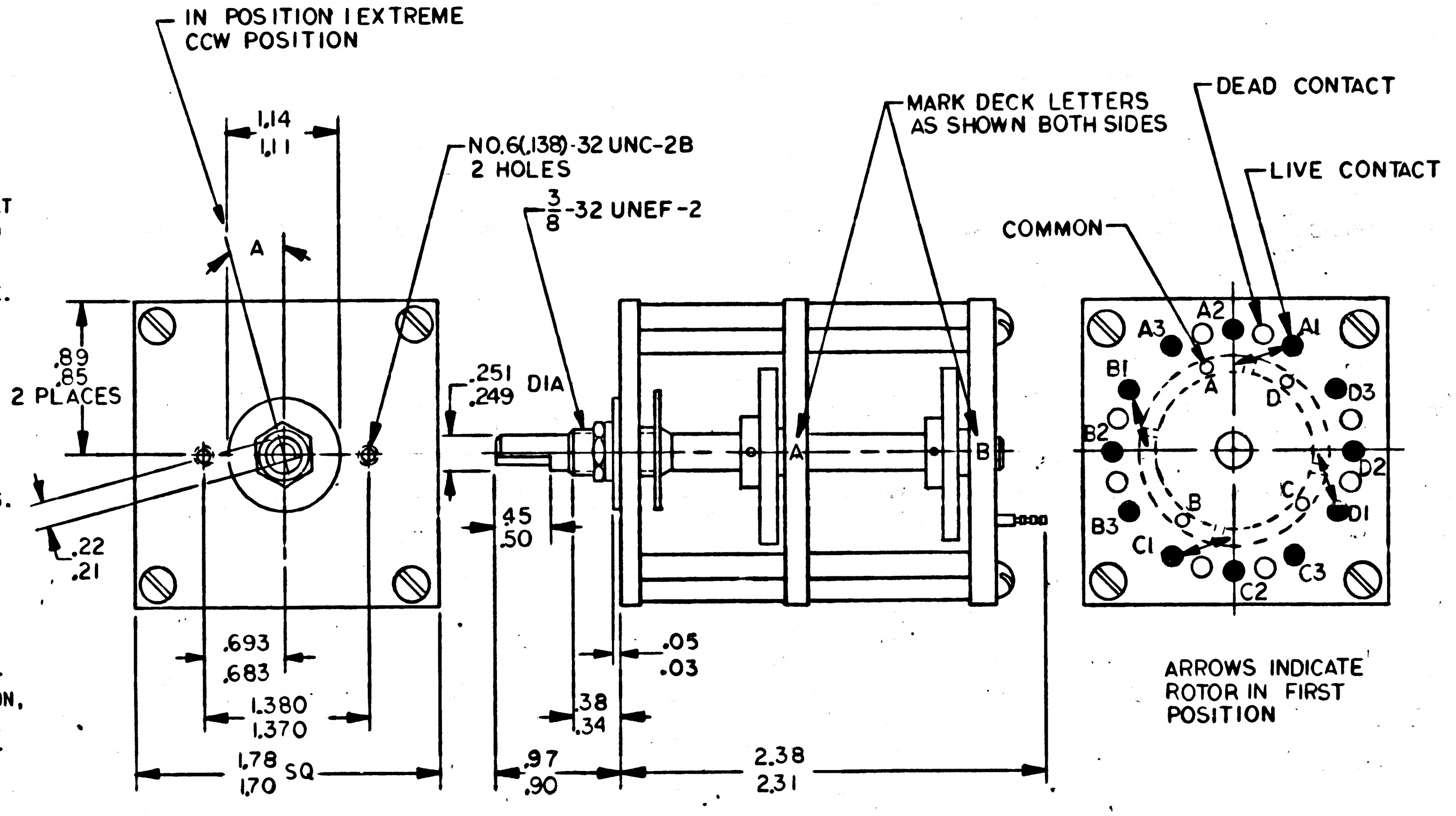
TABLE I

DASH NUMBER	NO. OF POSITIONS	NO. OF DECKS	A DEGREES
-1	2	2	15°
-2	3	2	30°

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 3 POSITION WITH ADJUSTABLE STOP PRESET AS SPECIFIED IN TABLE I, 30° INDEX, NON-SHORTING, ROTATION LIMITED BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 20 TO 112 INCH-OUNCES, MAXIMUM.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED IN SEQUENCE STARTING FROM SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01454 DATE 6-5-63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY. REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN Ray Wheeler DATE 7 May 63
CHECKED Lindell
APPROVAL C S Rexling 27 MAY 63
APPROVAL 5/27/63
APPROVAL 5/27/63
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL D. Sedlmeier 5 June 63
MIT APPROVAL L Wazel 6/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
3 POSITIONS / POLE, 4 POLES / DECK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006890

SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		
A	CLASS II CHANGE PER RD-R5287A DR Roy Wheeler CHK J Ruggeri APPD H. Maynard	9/12/63	JDS
B	REVISED PER TDRR 04301 DR S. Orifice CHK J J Ligon APPD H. Maynard	12/10/6	

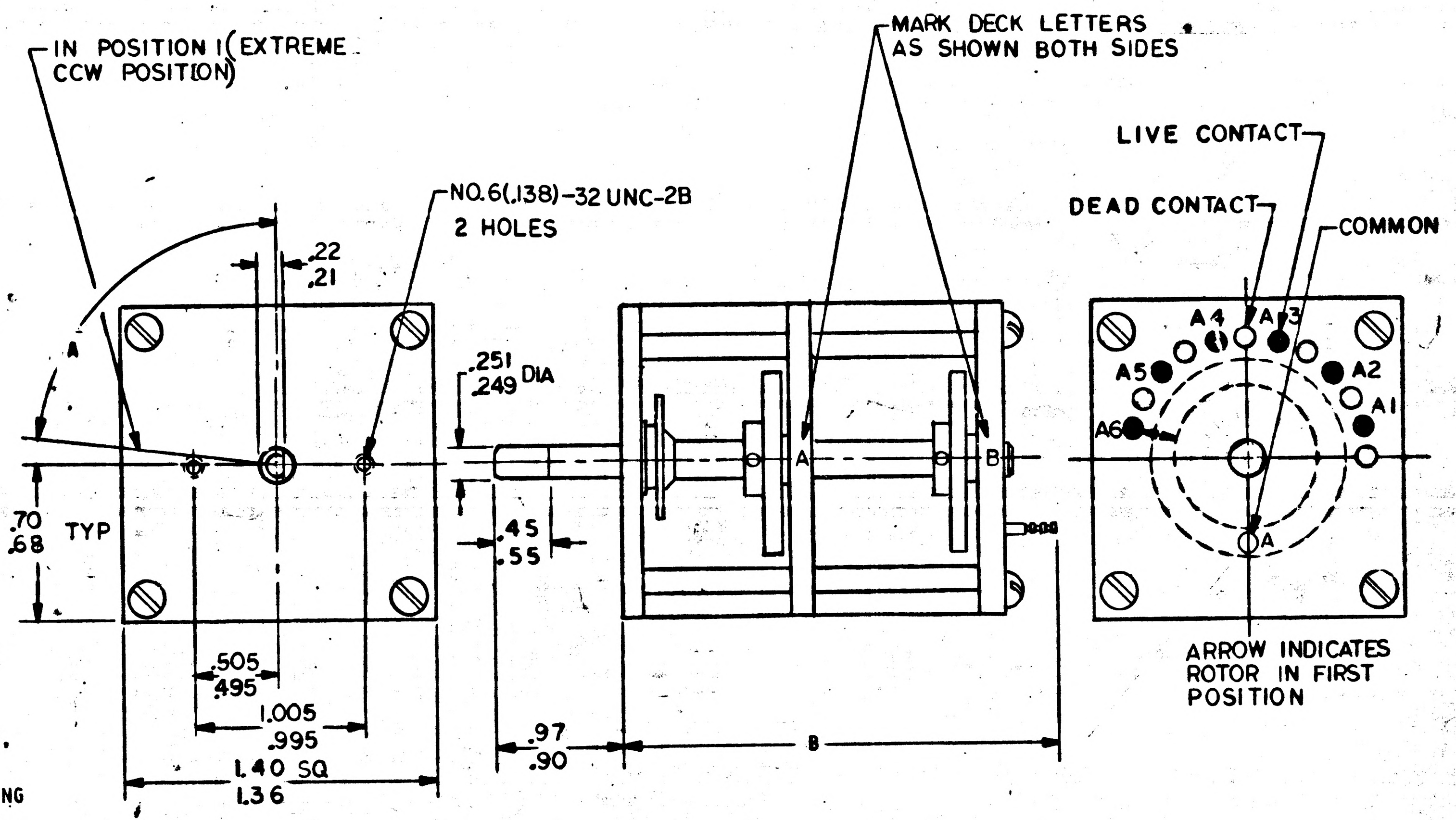
TABLE I

DASH NO.	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NO.	TOTAL ROTATION			B	A DEGREES
-1	6	150°	2	20 TO 55	2.51 2.43	76° 74°

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01562 DATE 12 June 63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 30° INDEX, NON-SHORTING, FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS AND NUMBER OF POSITIONS. ~~FOR WHICH THE ADJUSTABLE STOP IS PRESET.~~
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 25 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED, IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 9 MAY 63
CHECKED A. Barrows / H. Maynard 9 MAY 63
APPROVAL C. Sparling 6/3/63
APPROVAL 6/3/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 6/11/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
6 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006891
SCALE NONE	WT	SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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TABLE I

DASH NO.	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NO.	TOTAL ROTATION			B	A DEGREES
-1	6	150°	2	20 TO 55	2.51 2.43	76° 74°

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 01562		
A	CLASS II CHANGE PER RD-R5287A DR Boy Wheeler CHK J Ryan APPD A. Maynard	7/12/63	JDS
B	REVISED PER TDRR 04301 DR CHK APPD A Maynard		
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17070 DR J.P. Leonard CHK Lopez APPD A Maynard		KCD

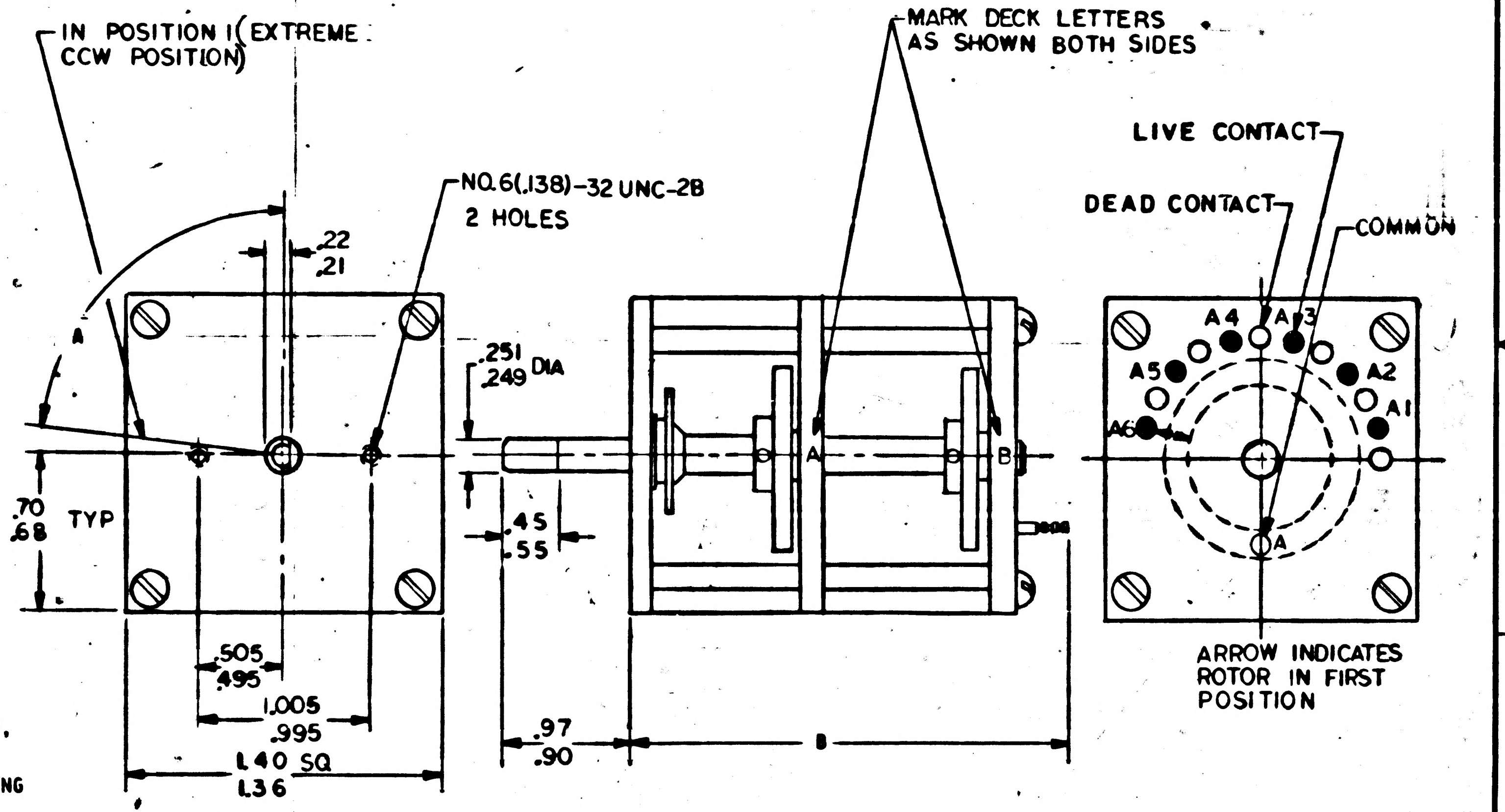
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 30° INDEX, NON-SHORTING, FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS AND NUMBER OF POSITIONS. ~~FOR WHICH THE ADJUSTABLE STOP IS PRESET.~~
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 25 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED, IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END.

~~3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~

4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



1006891 C

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Parmiss DATE 9 MAY 63
CHECKED A. / A Maynard 9 MAY 63
APPROVAL C Sparling
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 6/11/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
6 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006891
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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TABLE I

DASH NO.	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NO.	TOTAL ROTATION			B	A DEGREES
-1	6	150°	2	20 TO 55	2.51 2.43	76° 74°

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 0156e		
A	CLASS II CHANGE PER RD-R5287A DR Roy Wheeler CHK J Ruggeri APPD A. Maynard	7/12/63	JJS
B	REVISED PER TDRR 04301 DR S. Diaz CHK PJ Ryan APPD A Maynard	12 Nov 64	[illegible]
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17070 DR J.P. Leonard CHK P. Lopez APPD A Maynard	7/2/64	KCB
D	REVISED PER TDRR 18251 DR H. Wang CHK G. Gerber APPD A. Maynard	19 Aug 65	[illegible]

NOTES:

1. GENERAL REQUIREMENTS:
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   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
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   - A. SWITCH: SHALL BE SINGLE POLE, 30° INDEX, NON-SHORTING, FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS AND NUMBER OF POSITIONS. ~~FOR WHICH THE ADJUSTABLE STOP IS PRESET.~~
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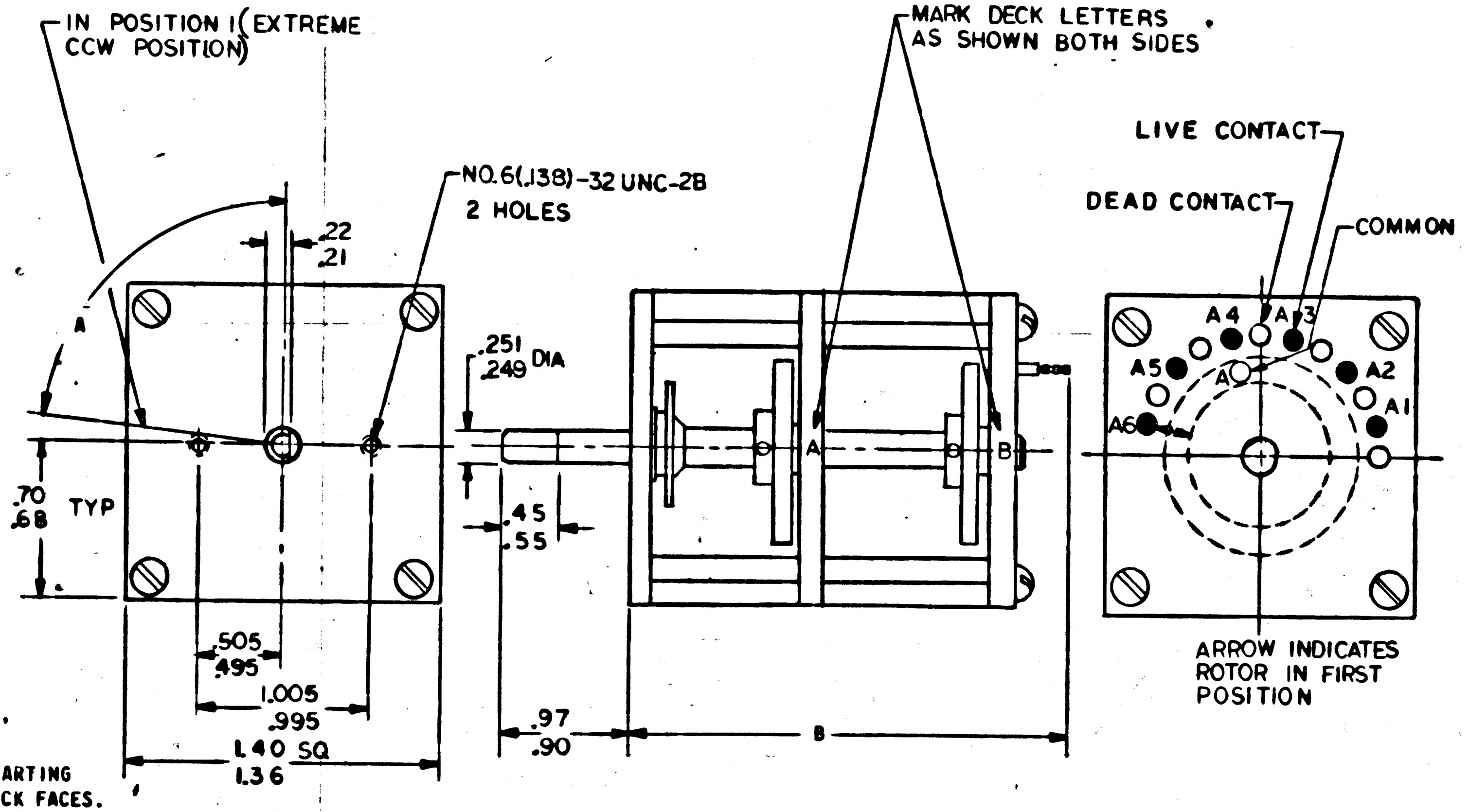
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 25 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SIDES SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END. FACE: SHALL BE MARKED A1 THRU A6 ON ALL DECK FACES.

~~3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~

4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.



IN POSITION I (EXTREME CCW POSITION)
A
.22
.21
NO.6(.138)-32 UNC-2B 2 HOLES
.70
.68
TYP
.505
.495
1.005
.995
1.40 SQ
1.36
.251
.249 DIA
.45
.55
.97
.90
B
MARK DECK LETTERS AS SHOWN BOTH SIDES
A
B
LIVE CONTACT
DEAD CONTACT
COMMON
A4
A3
A5
A2
A1
A6
A
ARROW INDICATES ROTOR IN FIRST POSITION

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Parsons DATE 9 MAY 63
CHECKED A. Simon / A Maynard 9 MAY 63
APPROVAL C. Sparling 6/3/63
APPROVAL [illegible] 6/3/63
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 6/11/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
6 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006891
SCALE NONE
WT
SHEET 1 OF 1

1006891 D

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 01562		
A	CLASS II CHANGE PER RD-R5287A DR Roy Wheeler CHK J Ruggi APPD A. Maynard	9/12/63	JDS
B	REVISED PER TDRR 04301 DR S. [illegible] CHK JJ Lyon APPD A Maynard	12 Nov [illegible]	[illegible]
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17070 DR J.P. Leonard CHK P. Lopez APPD A Maynard	4/2/[illegible]	KCB
D	REVISED PER TDRR 18251 DR H Wong CHK [illegible] APPD A. Maynard	19 Aug 65	[illegible]
E	REVISED PER TDRR 20226 DR H Wong CHK R Morta APPD A Maynard		8 HS 17 Jul 65

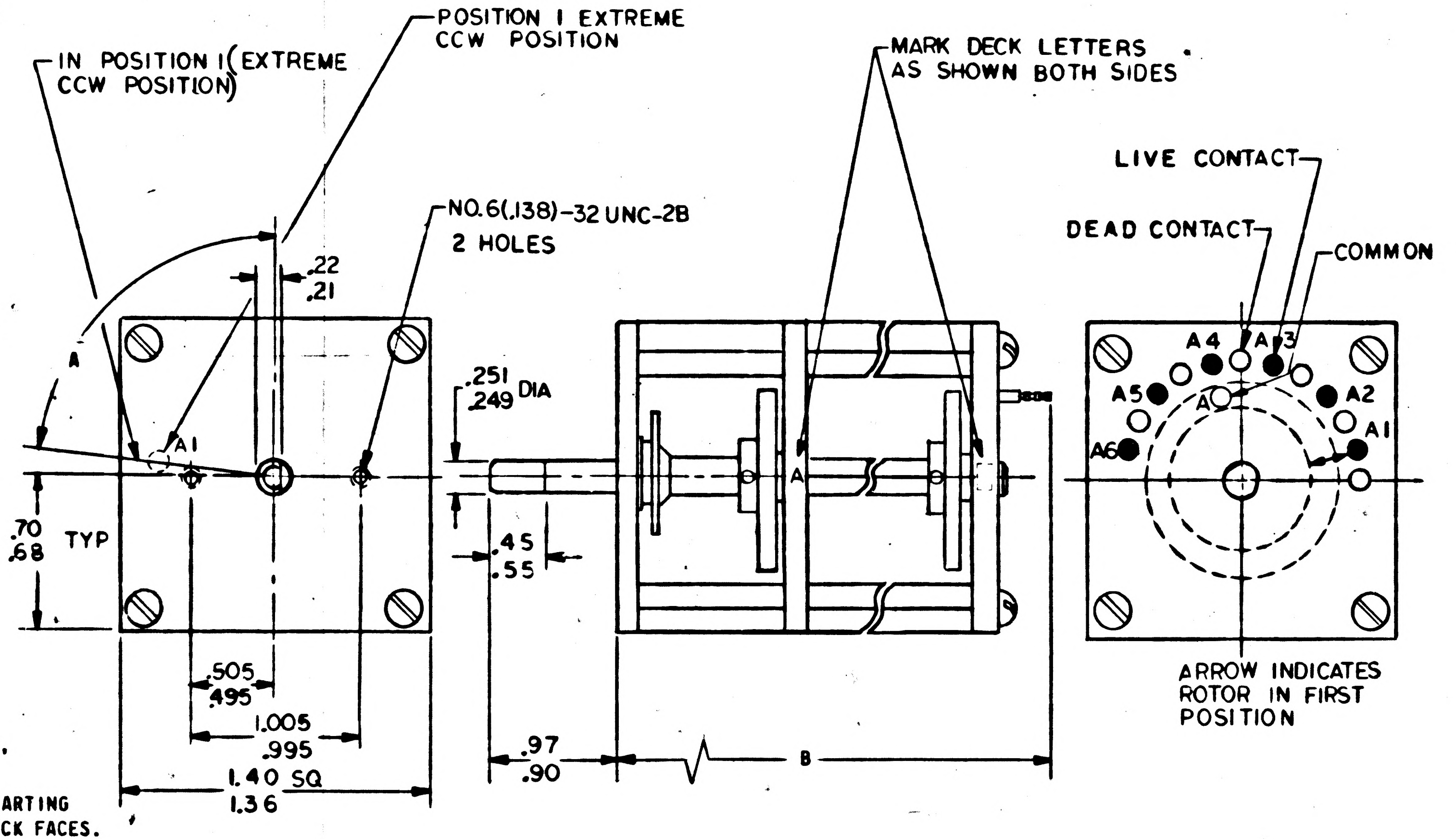
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 30° INDEX, NON-SHORTING, FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS AND NUMBER OF POSITIONS. ~~FOR WHICH THE ADJUSTABLE STOP IS PRESET.~~
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 25 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SIDES SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END. FACE: SHALL BE MARKED A1 THRU A6 ON ALL DECK FACES.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

TABLE I

DASH NO.	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NO.	TOTAL ROTATION			B	A DEGREES
-1	6	150°	2	20 TO 55	2.51 2.43	76° 74°
-2	6	150°	1	20 TO 55	1.60 1.52	76° 74°


IN POSITION I (EXTREME CCW POSITION)
POSITION I EXTREME CCW POSITION
NO. 6 (.138)-32 UNC-2B 2 HOLES
MARK DECK LETTERS AS SHOWN BOTH SIDES
LIVE CONTACT
DEAD CONTACT
COMMON
A
.22
.21
A1
.251
.249 DIA
.70
.68 TYP
.45
.55
.505
.495
1.005
.995
1.40 SQ
1.36
.97
.90
B
A
A1
A2
A3
A4
A5
A6
A
ARROW INDICATES ROTOR IN FIRST POSITION

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN H. Parmiee DATE 9 MAY 63
CHECKED A. Sam[illegible] / H Ma[illegible] 9 MAY 63
APPROVAL C Sparling 6/3/63
APPROVAL [illegible] 6/3/63
APPROVAL [illegible]
NASA APPROVAL Jack Barnard
MIT APPROVAL [illegible] 6/11/63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
30 DEGREE INDEX, NON-SHORTING, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
49956	C	1006891

SCALE NONE WT SHEET 1 OF 1

1006891 E

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

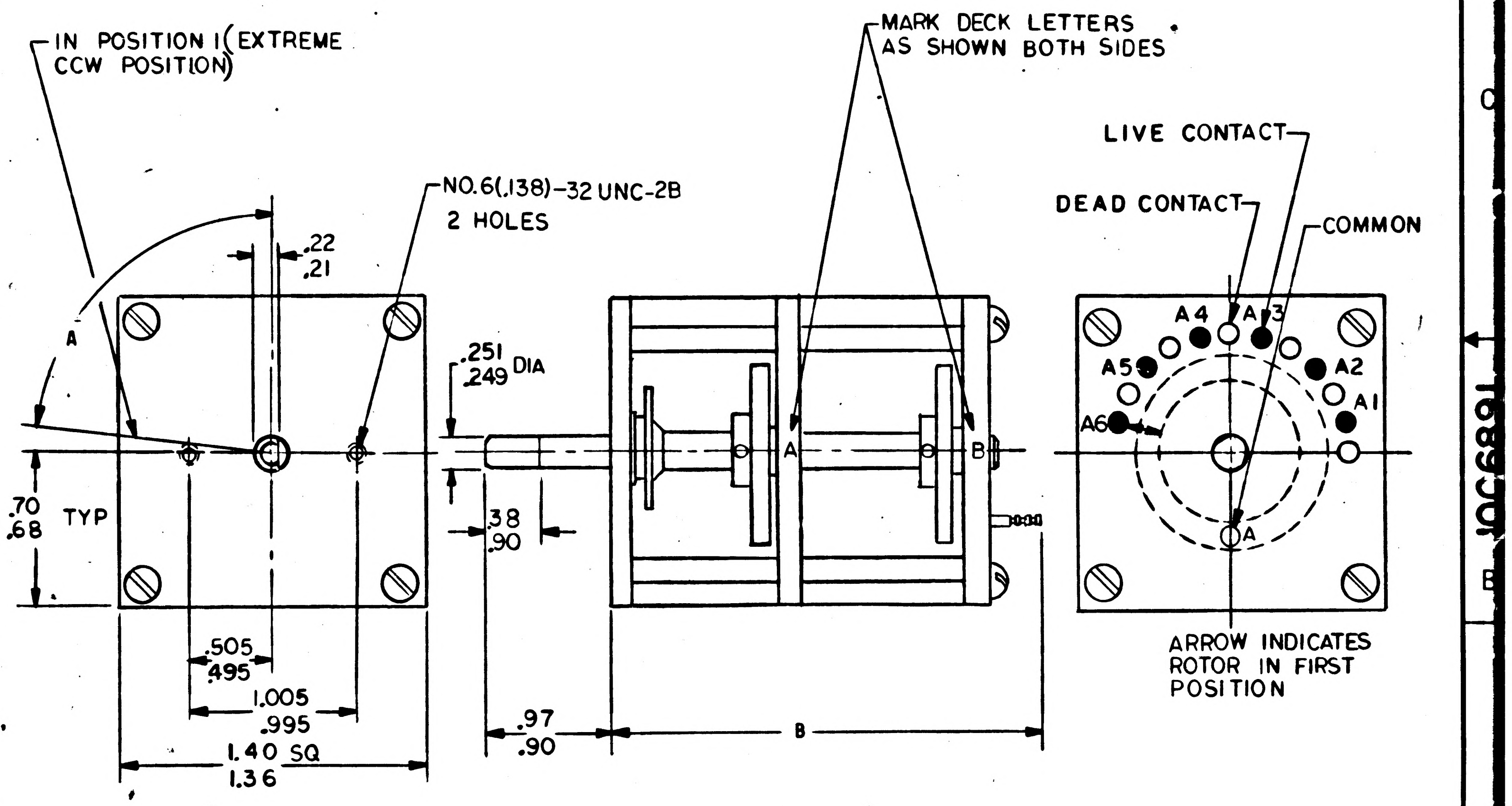
TABLE I

DASH NO.	POSITIONS		NO. OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSIONS	
	NO.	TOTAL ROTATION			B	A DEGREES
-1	6	150°	2	20 TO 55	2.51 2.43	76° 74°

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01562 DATE 12 June 63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 30° INDEX, NON-SHORTING, FLATTED SHAFT. SEE TABLE I FOR NUMBER OF DECKS AND NUMBER OF POSITIONS FOR WHICH THE ADJUSTABLE STOP IS PRESET.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 25 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED, IN SEQUENCE, STARTING FROM THE SHAFT END, ON OPPOSITE SIDES.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN H. Prunier DATE 9 MAY 63
CHECKED A. Serra / H. Martin 9 MAY 63
APPROVAL C. Sparling 6/3/63
APPROVAL J. S. 6/3/63
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL 6/11/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
6 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006891
SCALE NONE
WT
SHEET 1 OF 1

1006891

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggiri APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR A. Dufree CHK J S Ryer APPD H. Maynard	12/10/63	

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01394 DATE 5/25/63

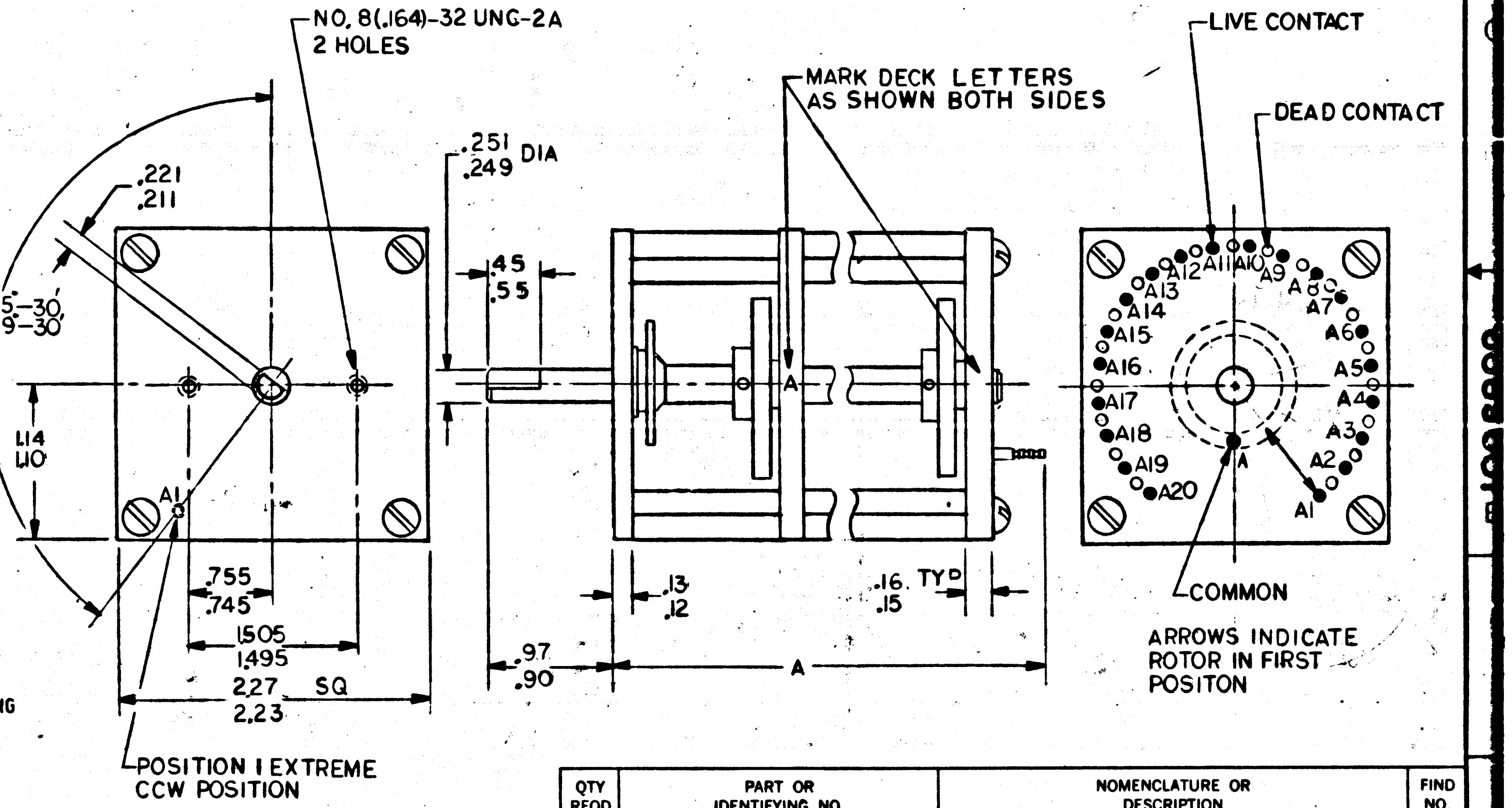
TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1-7/16±1/32
-2	5	20 TO 144	5-11/16±1/16

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 20 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 285° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END..
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Brennan DATE 6MAY63
CHECKED D. Lindell S. Gelenj 6MAY63
APPROVAL J. Nazpank 5/21/63
APPROVAL A. D. Dempsey 5/21/63
APPROVAL L. E. Gottwald Jr. 5/21/63
NASA APPROVAL Jack Barnard
MIT APPROVAL C. Swiener 5/29/63
MIT APPROVAL Hoffer 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
20 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006892
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR A. Aufiero CHK J J Rogers APPD H. Maynard	12/10/63	[illegible]
C	CHANGED PER TDRR 14116 DR D. Young CHK A. G. C. APPD D. Slaper	12/2/64	KCS

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01384 DATE 5/28/63

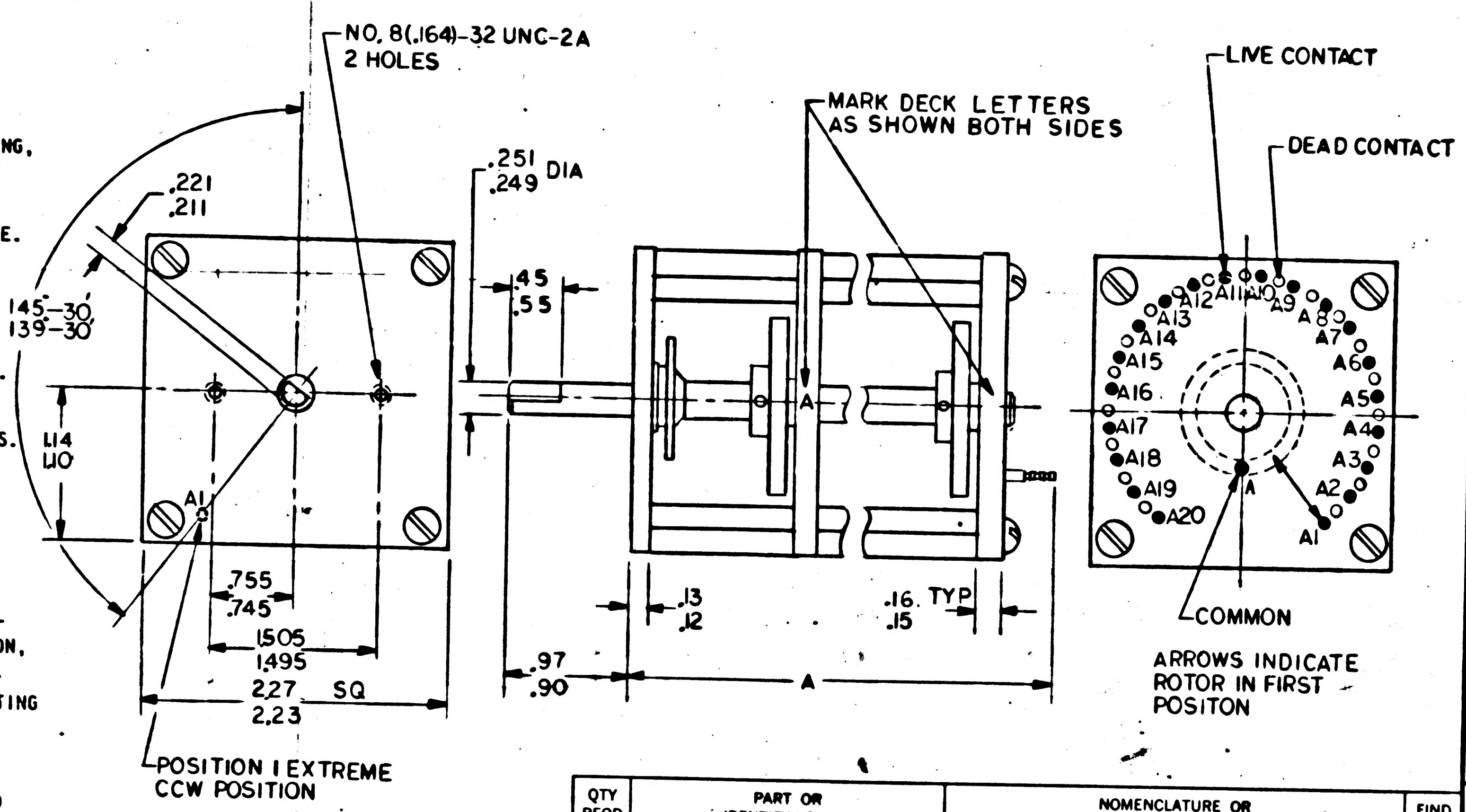
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 20 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 285° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END..
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
5. PREPARATION FOR DELIVERY SHALL BE PER ND 1002215, CLASS I, CODE 2.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1-7/16±1/32
-2	5	20 TO 144	5-11/16±1/16
-3	6	20 TO 160	6-3/4±1/16



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Brunner DATE 6 MAY 63
CHECKED D. Lindell A. Jelly 8 MAY 63
APPROVAL J. Kasperek 5/21/63
APPROVAL A. D. Dunjon 5/21/63
APPROVAL L. S. [illegible] 5/21/63
NASA APPROVAL Jack Barnard
MIT APPROVAL D. Solomon 5/29/63
MIT APPROVAL W. Koffer 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
20 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006892
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 20 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 285° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END..
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY SHALL BE PER ND 1002215.

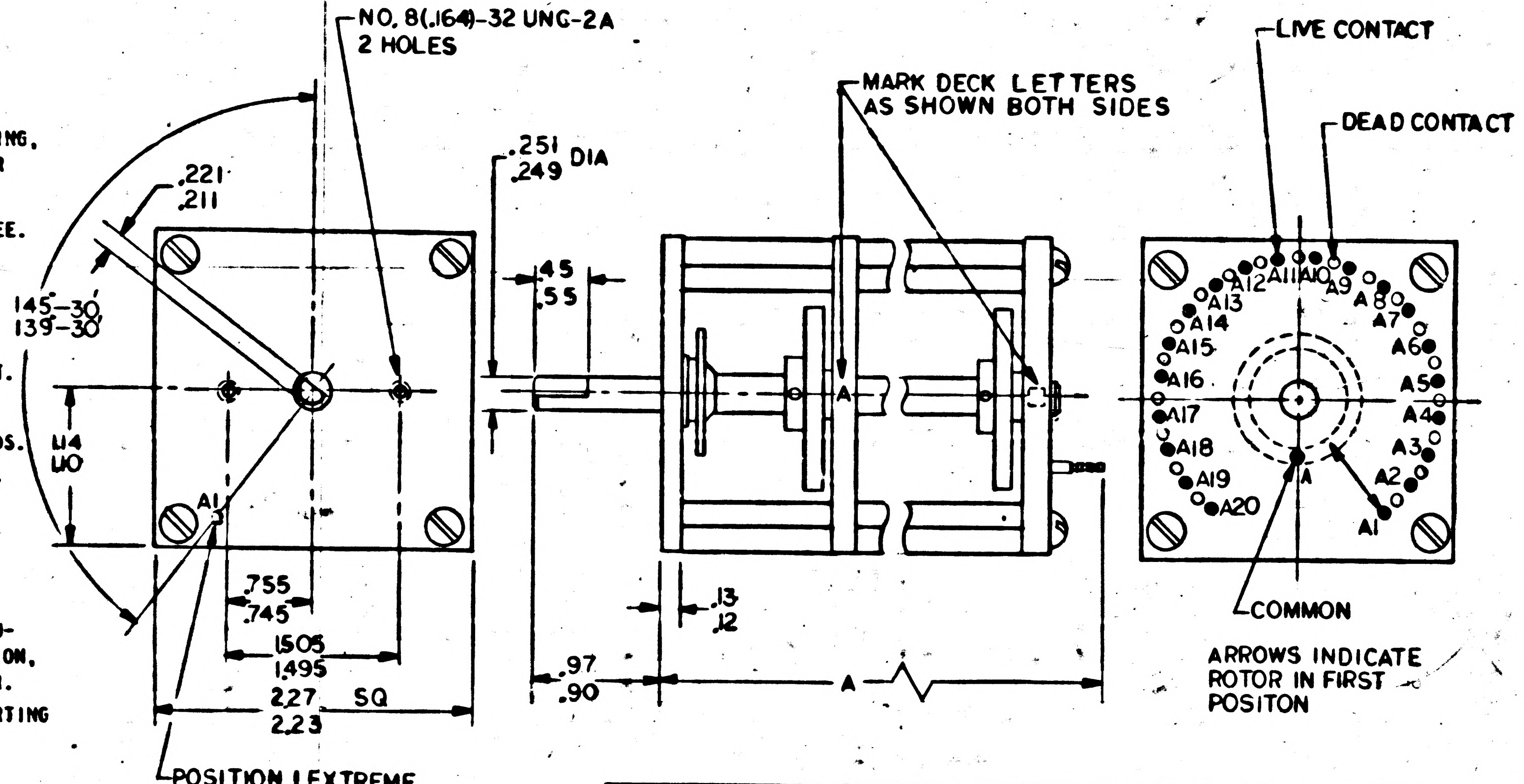
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1-7/16±1/32
-2	5	20 TO 144	5-11/16±1/16
-3	6	20 TO 160	6-3/4±1/16

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	RELEASED PER TDRR NO. 01394		
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggia APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR A. Anfuso CHK APPD H. Maynard	12/10/4	[illegible]
C	CHANGED PER TDRR 14116 DR D. Young CHK A. G. C. APPD D. Slaper	12/2/64	KCG3
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16747 DR R. Leblanc CHK APPD H. Maynard	3/11/65	NEO



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.

DRAWN H. Bernier DATE 6MAY63
CHECKED 8MAY63
APPROVAL 5/21/63
APPROVAL 5/21/63
APPROVAL
NASA APPROVAL
MIT APPROVAL 5/29/63
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
20 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006892
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–	RELEASED PER TDRR NO. 01394		
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggiero APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR A. Ourfee CHK J J Roger APPD H. Maynard	12/10/61	DW
C	CHANGED PER TDRR 14116 DR D. Mong CHK A. G. C. APPD D. Slaper	12/2/64	KCCS
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16747 DR R Leclair CHK J.F. APPD H. Maynard	3/11/65	KEO
E	REVISED PER TDRR 18711 DR R.M. Donohue CHK [illegible] APPD H Maynard	5/6/65	SRB

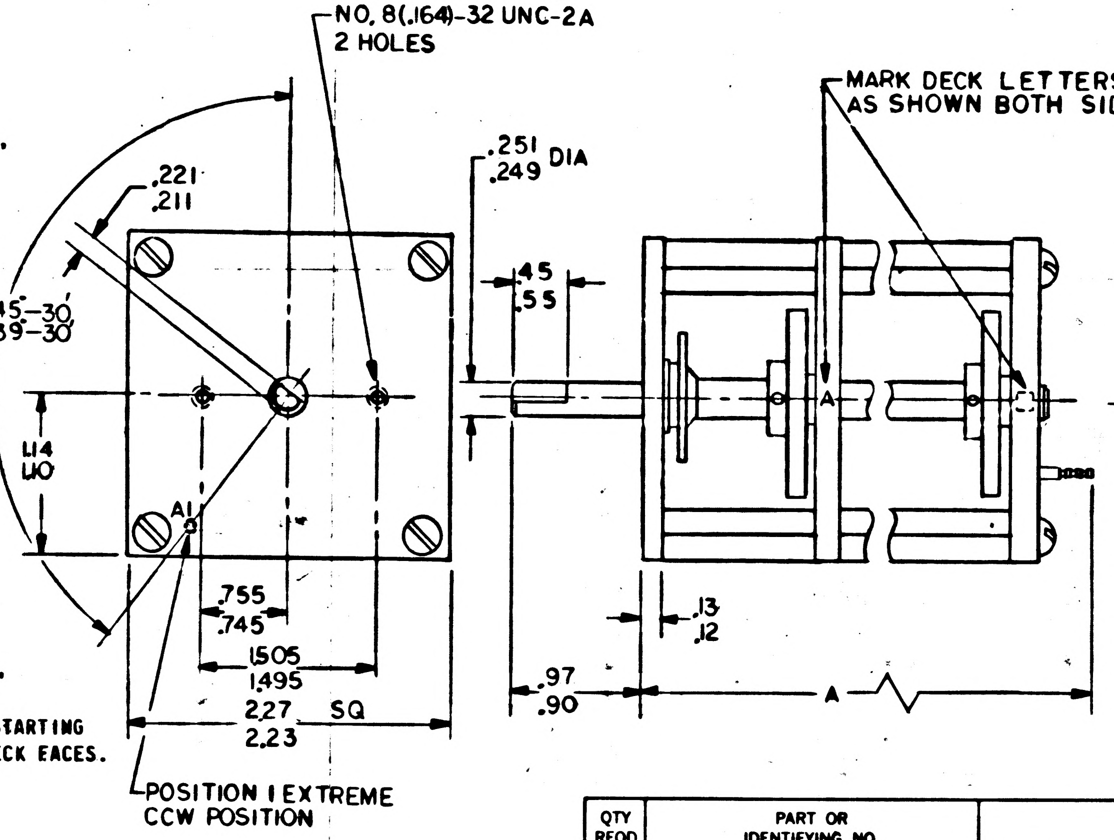
NOTES:

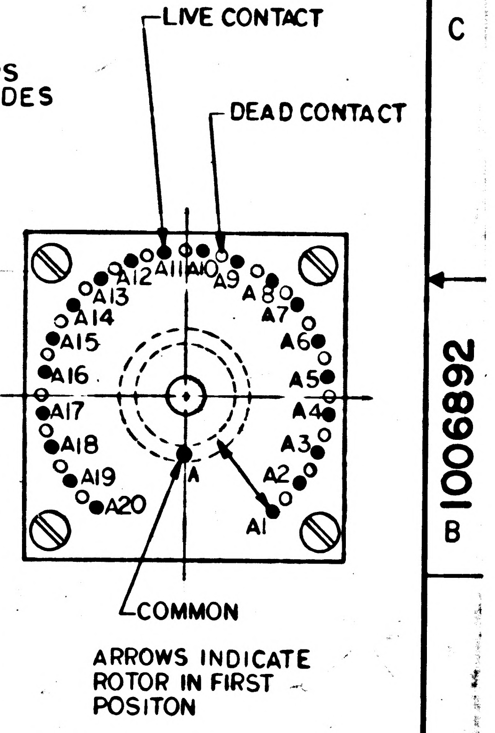
1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 20 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 285° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SIDES SHALL BE MARKED IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END. FACE SHALL BE MARKED A1 THRU A20 ON ALL DECK FACES.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY SHALL BE PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1-7/16±1/32
-2	5	20 TO 144	5-11/16±1/16
-3	6	20 TO 160	6-3/4±1/16





FACE VIEW

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H Bureau DATE 6 MAY 63
CHECKED [illegible] 8 MAY 63
APPROVAL J Kozak 5/21/63
APPROVAL [illegible] 5/21/63
APPROVAL [illegible]
NASA APPROVAL Jack Barnard
MIT APPROVAL D Solomon 5/29/63
MIT APPROVAL [illegible] 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
20 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006892
SCALE NONE
WT
SHEET 1 OF 1

1006892

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 20 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 285° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SIDES SHALL BE MARKED IN ALPHABETICAL SEQUENCE, STARTING FROM THE SHAFT END. FACE SHALL BE MARKED A1 THRU A20 ON ALL DECK FACES.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY SHALL BE PER ND 1002215.

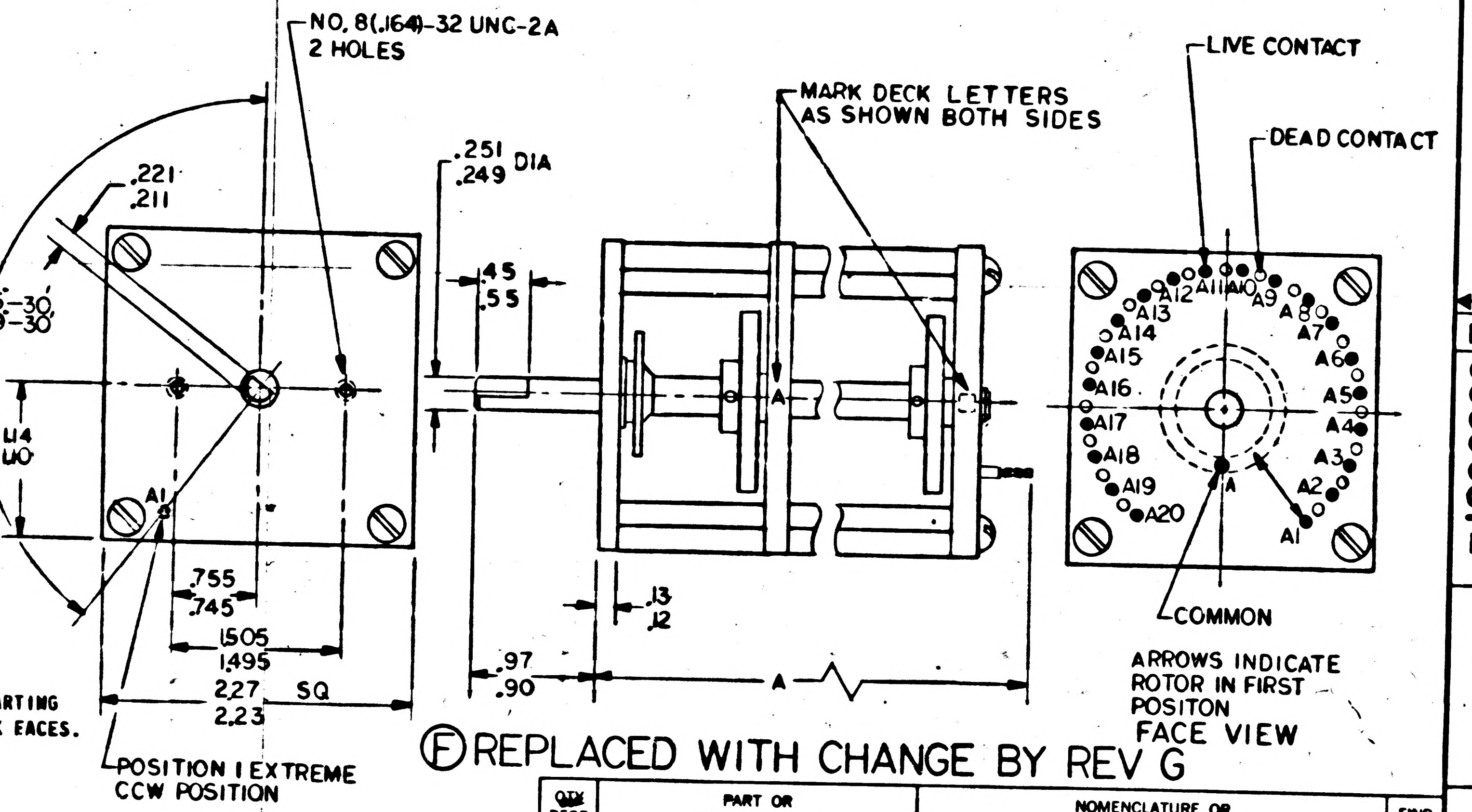
PROCURE ONLY FROM APPROVED SOURCES AS LISTED IN CONTRACTOR'S QUALIFIED VENDORS LIST.

TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1-7/16±1/32
-2	5	20 TO 144	5-11/16±1/16
-3	6	20 TO 160	6-3/4±1/16

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	RELEASED PER TDRR NO. 01394		
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. [illegible] APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR [illegible] CHK [illegible] APPD H. Maynard	[illegible]	[illegible]
C	CHANGED PER TDRR 14116 DR D. Wong CHK A. G. C. APPD D. [illegible]	12/2/64	[illegible]
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16747 DR [illegible] CHK [illegible] APPD H. Maynard	3/11/65	[illegible]
E	REVISED PER TDRR 18711 DR R.M. Donohue CHK [illegible] APPD H Maynard	[illegible]	[illegible]
F	REPLACED WITH CHANGES BY REV G PER TDRR 23572 DR H. Wong CHK [illegible] APPD [illegible]	12/8/65	S.F.S.



Ⓕ REPLACED WITH CHANGE BY REV G

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H [illegible] DATE 6 MAY 63
CHECKED [illegible] 8 MAY 63
APPROVAL [illegible] 5/2?/63
APPROVAL [illegible] 5/21/63
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 5/29/63
MIT APPROVAL [illegible] 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
20 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006892
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006892 F

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE SINGLE POLE, 20 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 285° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED IN NUMERICAL SEQUENCE, STARTING FROM THE SHAFT END..
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

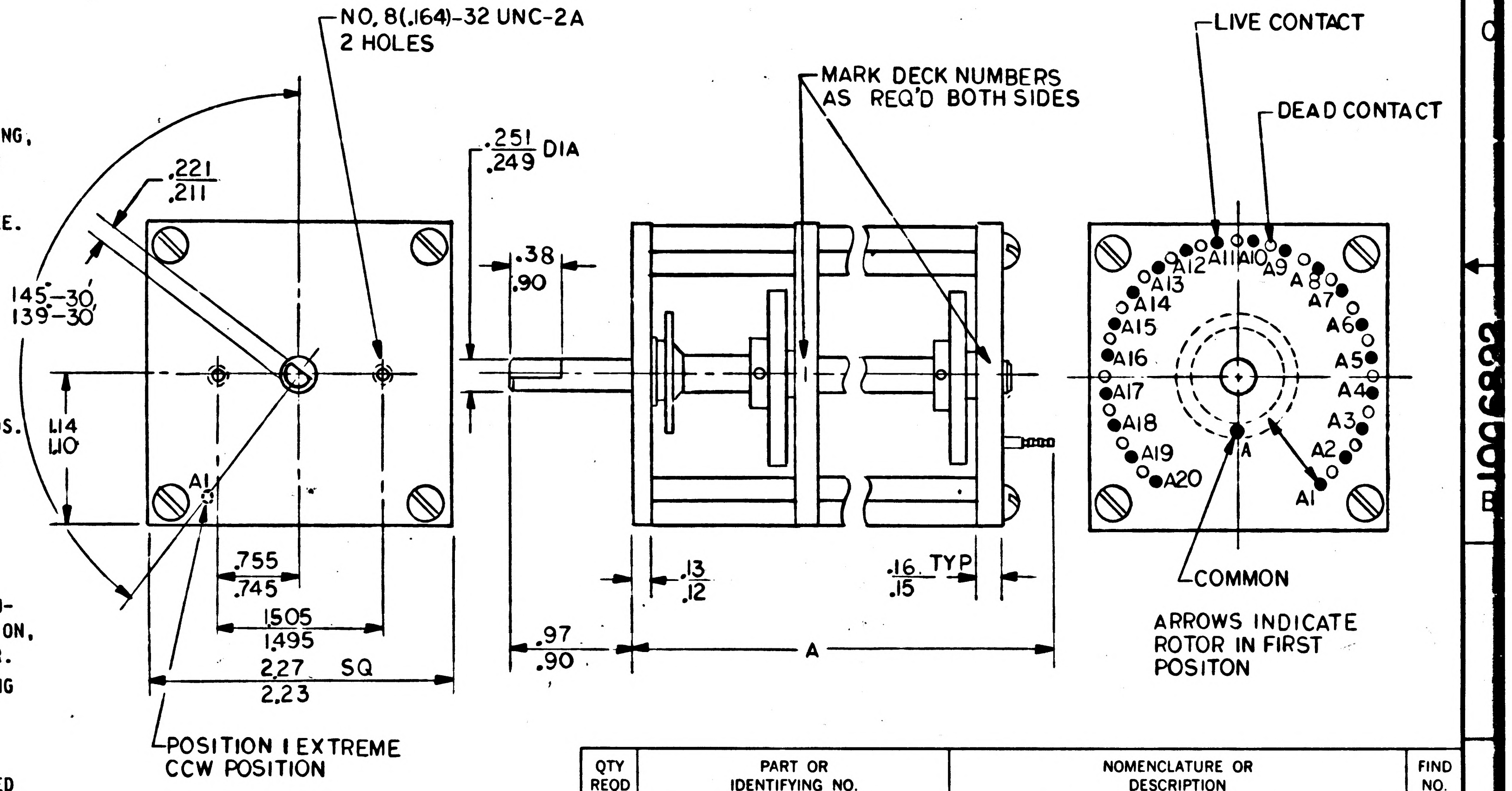
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	1	20 TO 80	1-7/16±1/32
-2	5	20 TO 144	5-11/16±1/16

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01384 DATE 5/25/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H Prunier DATE 6 MAY 63
CHECKED 8 MAY 63
APPROVAL 5/21/63
APPROVAL 5/21/63
APPROVAL
NASA APPROVAL Jack Barnard
MIT APPROVAL 5/29/63
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
20 POSITIONS / POLE, 1 POLE / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006892
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR L. Chifiso CHK J. F. Ligon APPD H. Maynard	12/10/63	

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 01384 DATE 5/28/63

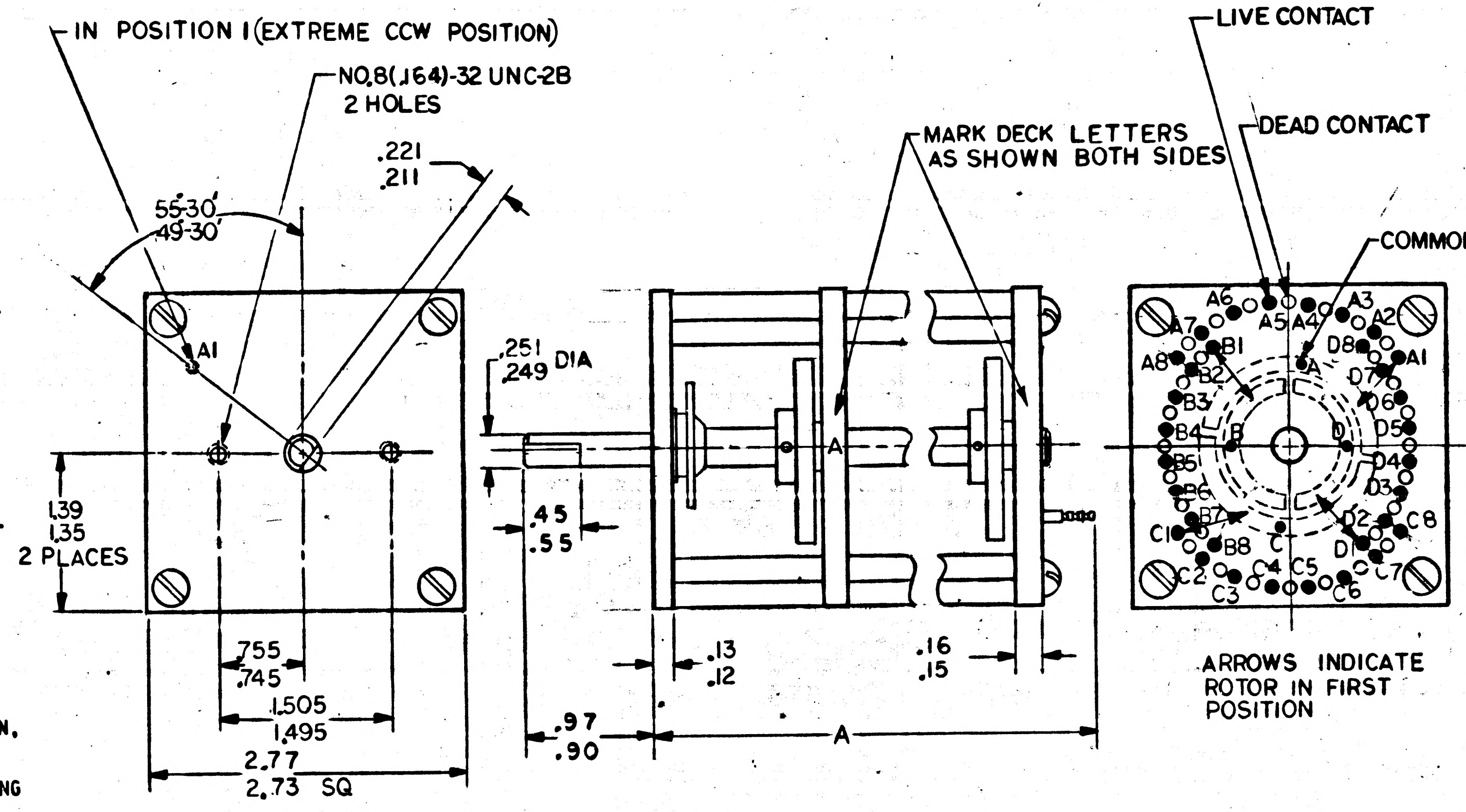
TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	4	20 TO 192	4-5/8±1/16

(M)

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 8 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 105° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARDS: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.



ARROWS INDICATE ROTOR IN FIRST POSITION

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO.
DRAWN DATE 3 MAY 63
CHECKED W. J. Gifford
APPROVAL 5/21/63
APPROVAL JJS 5/21/63
APPROVAL 5/24/63
NASA APPROVAL
MIT APPROVAL 5/29/63
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
8 POSITIONS / POLE, 4 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006893
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

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ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—			
A	CLASS II CHANGE PER RD-R5287A DR Gay Wheeler CHK J. Ruggeri APPD H. Maynard	9/14/63	JJS
B	REVISED PER TDRR 04301 DR CHK APPD H. Maynard	12/4/63	
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16752 DR J P Leonard CHK Alegre APPD H. Maynard	3/4/65	

TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	4	20 TO 192	4-5/8±1/16

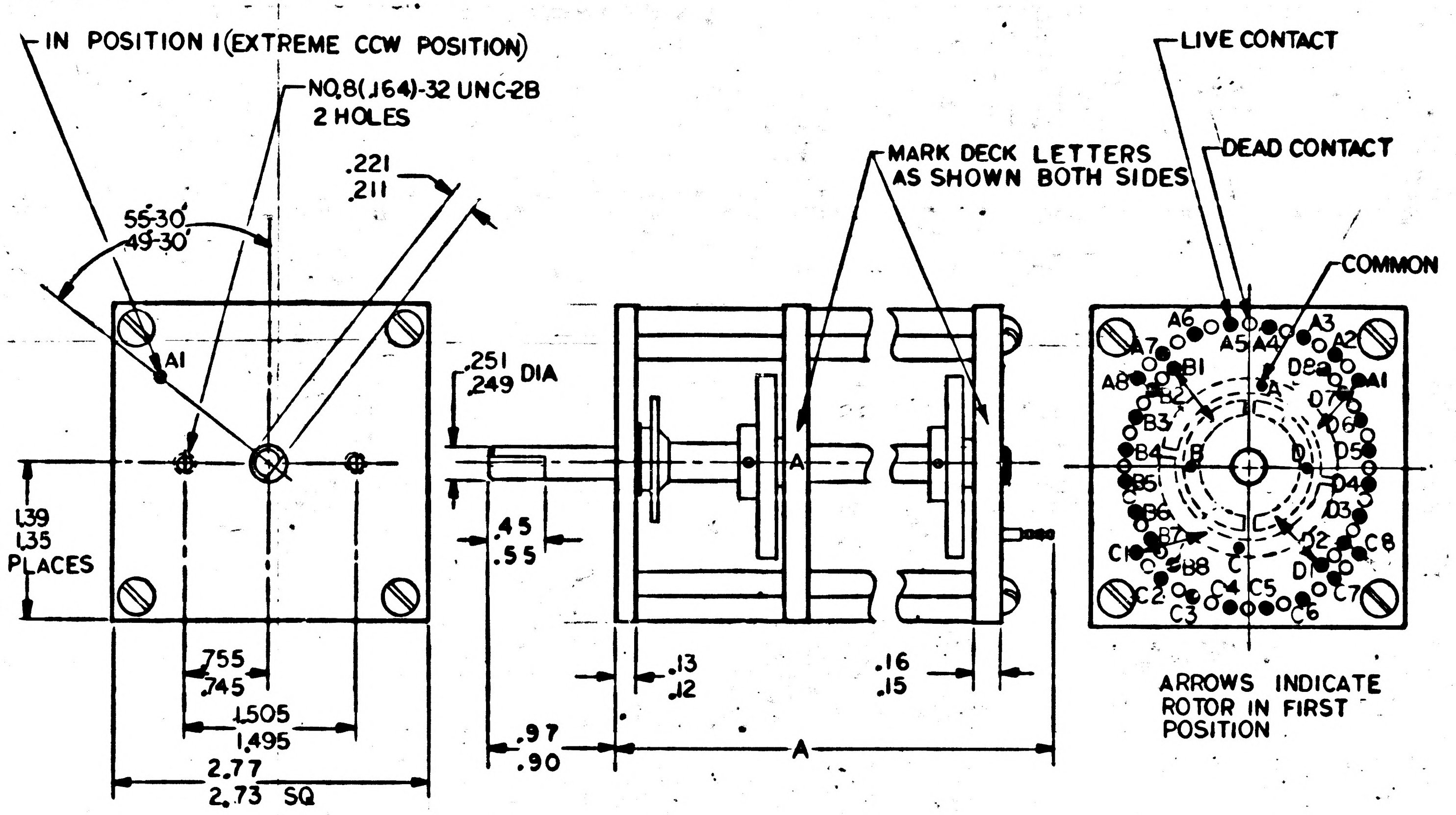
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX-INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 8 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 105° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARDS: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END.

~~3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~

4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



ARROWS INDICATE ROTOR IN FIRST POSITION

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 3 MAY 63
CHECKED W. J. Gifford
APPROVAL 5/24/63
APPROVAL JJS 5/31/63
APPROVAL JJS
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
8 POSITIONS / POLE, 4 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006893
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006893

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED

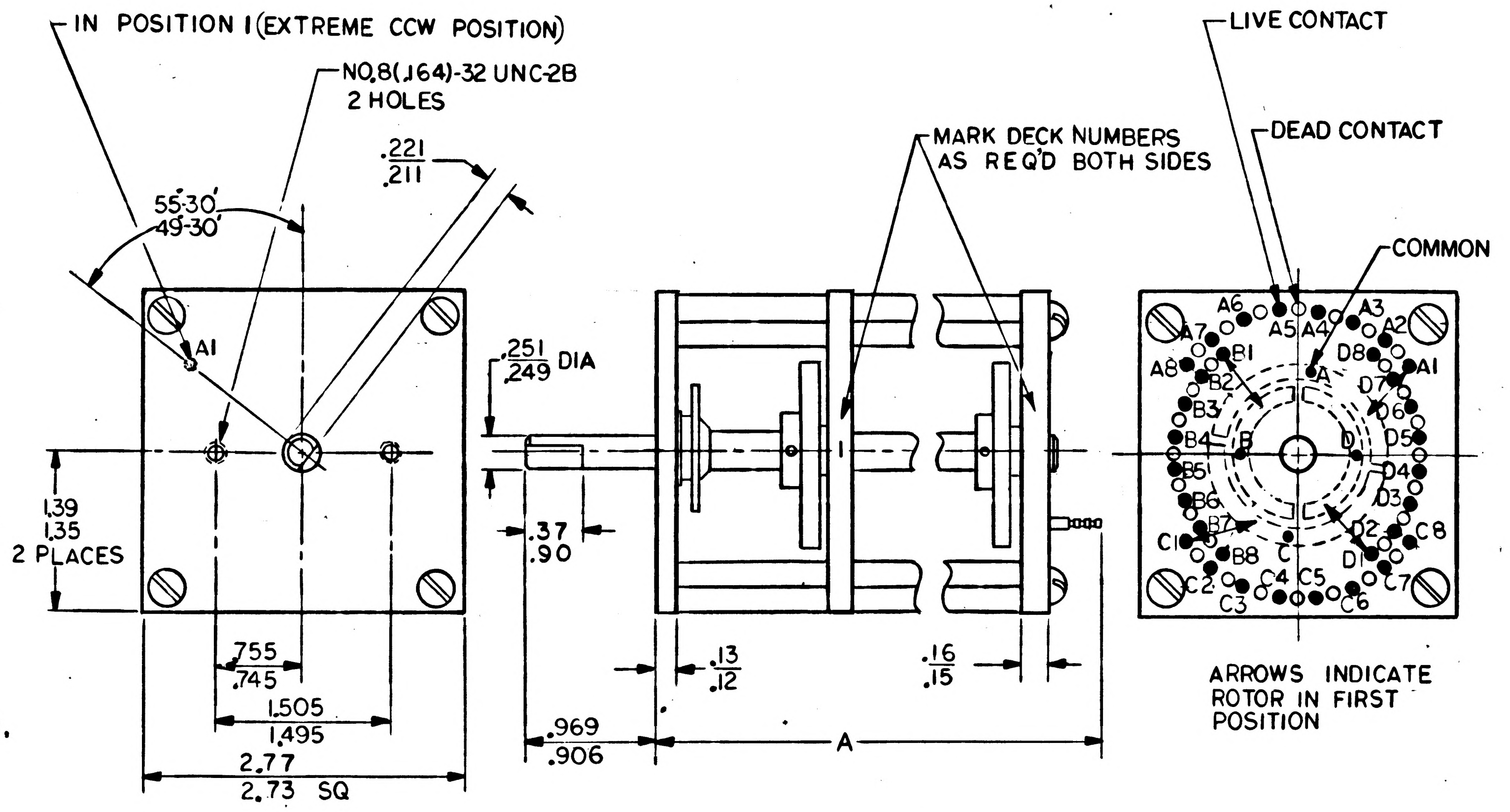
TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	4	20 TO 192	4-5/8±1/16

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 01384 DATE 5/28/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 8 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 105° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARDS: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED IN NUMERICAL SEQUENCE STARTING FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.


IN POSITION I (EXTREME CCW POSITION)
NO.8(.164)-32 UNC-2B
2 HOLES
.221
.211
55°30'
49°30'
A1
.251
.249 DIA
1.39
1.35
2 PLACES
.755
.745
1.505
1.495
2.77
2.73 SQ
.37
.90
.13
.12
.16
.15
.969
.906
A
MARK DECK NUMBERS AS REQ'D BOTH SIDES
LIVE CONTACT
DEAD CONTACT
COMMON
A1 A2 A3 A4 A5 A6 A7 A8 A
B1 B2 B3 B4 B5 B6 B7 B8 B
C1 C2 C3 C4 C5 C6 C7 C8 C
D1 D2 D3 D4 D5 D6 D7 D8 D

ARROWS INDICATE ROTOR IN FIRST POSITION

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Prunier DATE 3 MAY 63
CHECKED W. J. Gifford A. Yelasy 6 May 63
APPROVAL John Korpuk 5/21/63
APPROVAL A. Wampa J.J.B. 5/21/63
APPROVAL L. E. Spittuny J.J.B. 5/21/63
NASA APPROVAL
MIT APPROVAL D. Sclamiero 5/28/63
MIT APPROVAL A. Hopper 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
8 POSITIONS / POLE, 4 POLES / DECK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. SIZE C NASA DRAWING NO. 1006893
SCALE NONE WT SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	4	20 TO 192	4-5/8±1/16
-2	2	20 TO 144	2-1/2±1/16

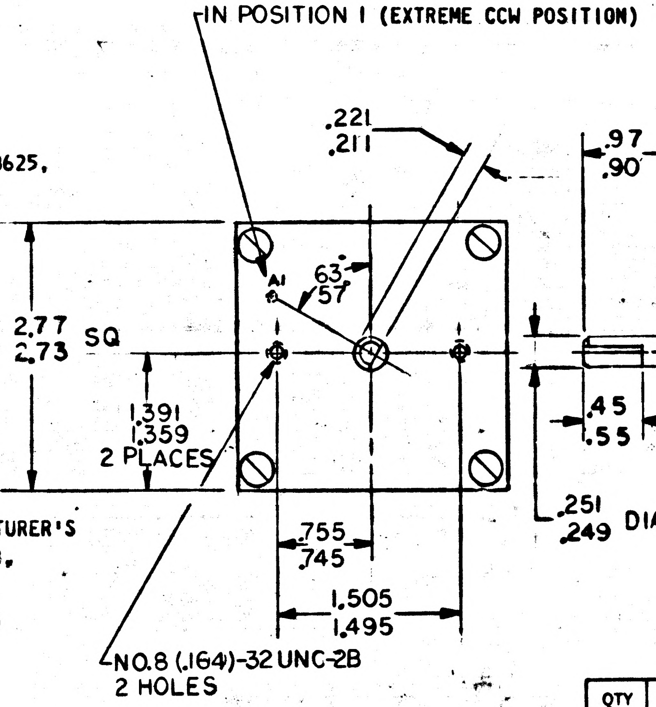
REVISIONS

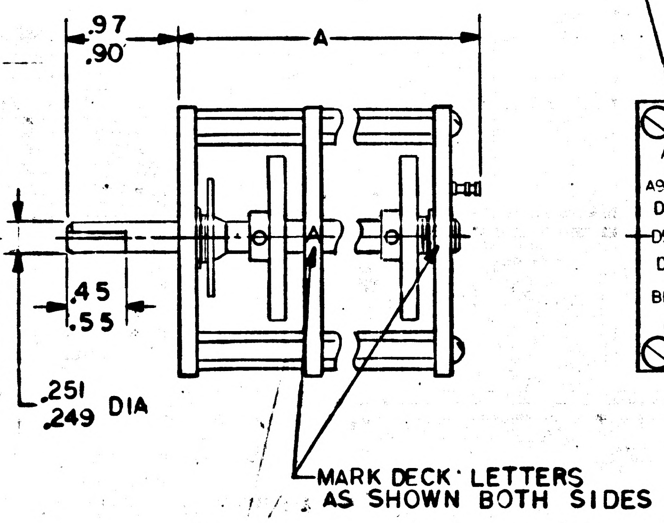
SYM	DESCRIPTION	DATE	APPROVED
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD H. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR J. Orifice CHK G. F. Logan APPD H. Maynard	12/10/63	

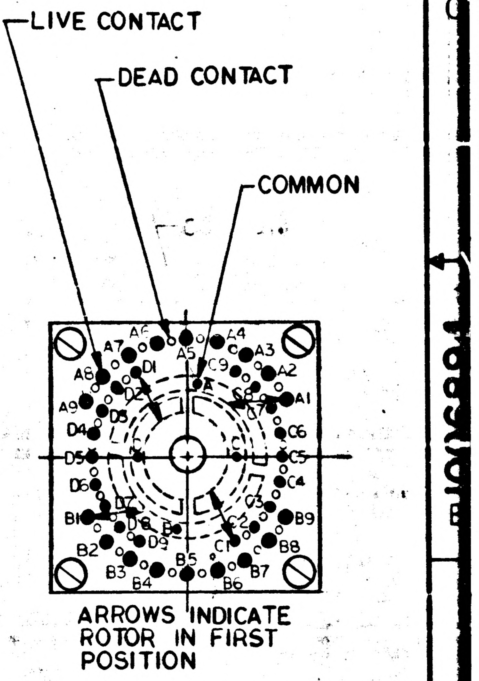
FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01384 DATE 5/28/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 9 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 120° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE-ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITH SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.







QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS
CONTRACT NO.
DRAWN H. Pennisi DATE 2 MAY 63
CHECKED W. J. Gifford 8 MAY 63
APPROVAL 5/21/63
APPROVAL 5/21/63
APPROVAL 5/24/63
NASA APPROVAL
MIT APPROVAL 5/29/63
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
9 POSITIONS / POLE, 4 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006894
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
—	CLASS B RELEASE PER TDRR 01394		
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD A. Maynard	9/12/63	JJS
B	REVISED PER TDRR 04301 DR [illegible] CHK [illegible] APPD A. Maynard	12/10/63	[illegible]
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17072 DR J.P. Leonard CHK C. Mazza APPD A. Maynard	7/29/65	KCB

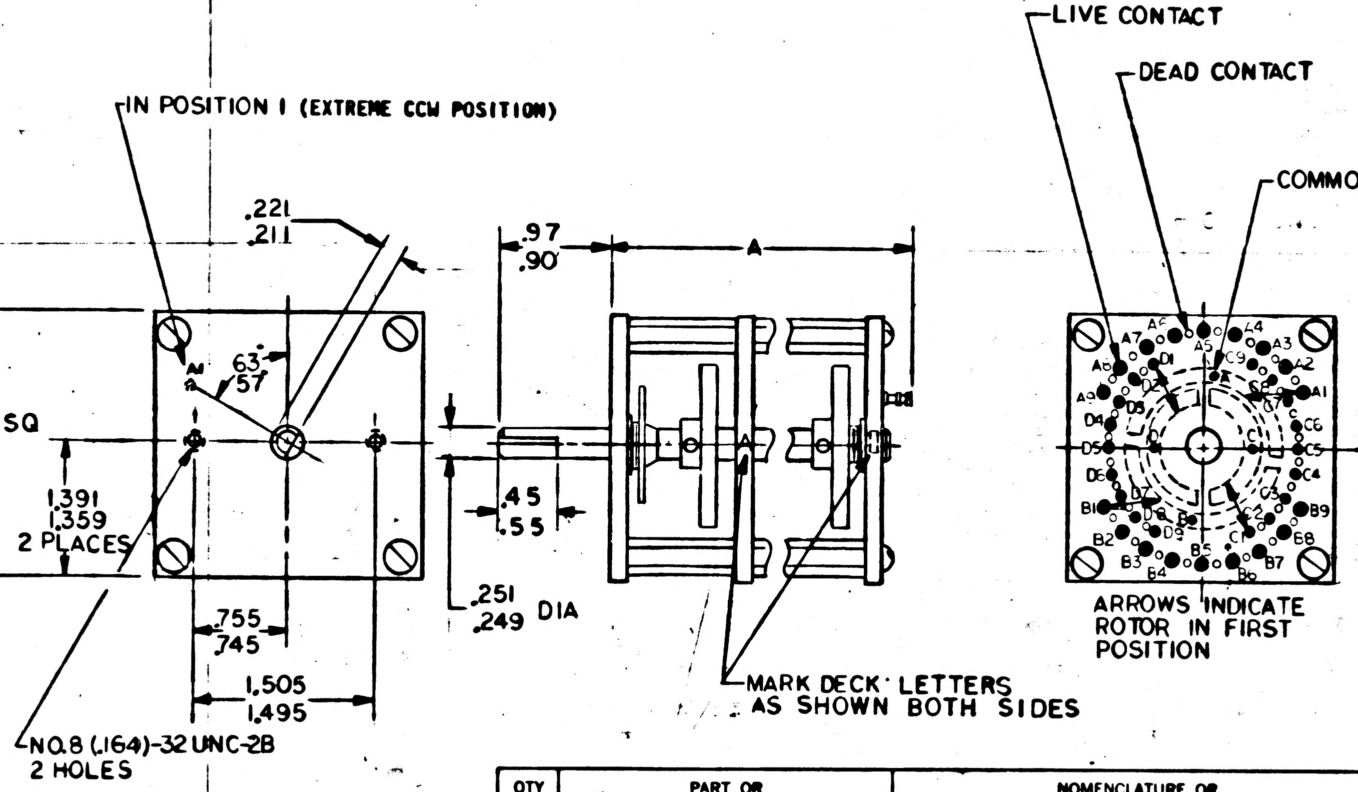
TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	4	20 TO 192	4-5/8±1/16
-2	2	20 TO 144	2-1/2±1/16

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 9 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 120° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITH SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858.
5. PREPARATION FOR DELIVERY PER ND 1002215.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Pruneau DATE 2 MAY 63
CHECKED W. J. Gifford [illegible] 2 May 63
APPROVAL [illegible] 5/2/63
APPROVAL [illegible] 5/21/63
APPROVAL [illegible] 5/21/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 5/29/63
MIT APPROVAL [illegible] 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
9 POSITIONS / POLE, 4 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006894
SCALE NONE
WT
SHEET 1 OF 1

1006894 B

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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TABLE I

DASH NUMBER	NUMBER OF DECKS	SWITCHING TORQUE INCH-OUNCES	DIMENSION A
-1	4	20 TO 192	4-5/8±1/16
-2	2	20 TO 144	2-1/2±1/16

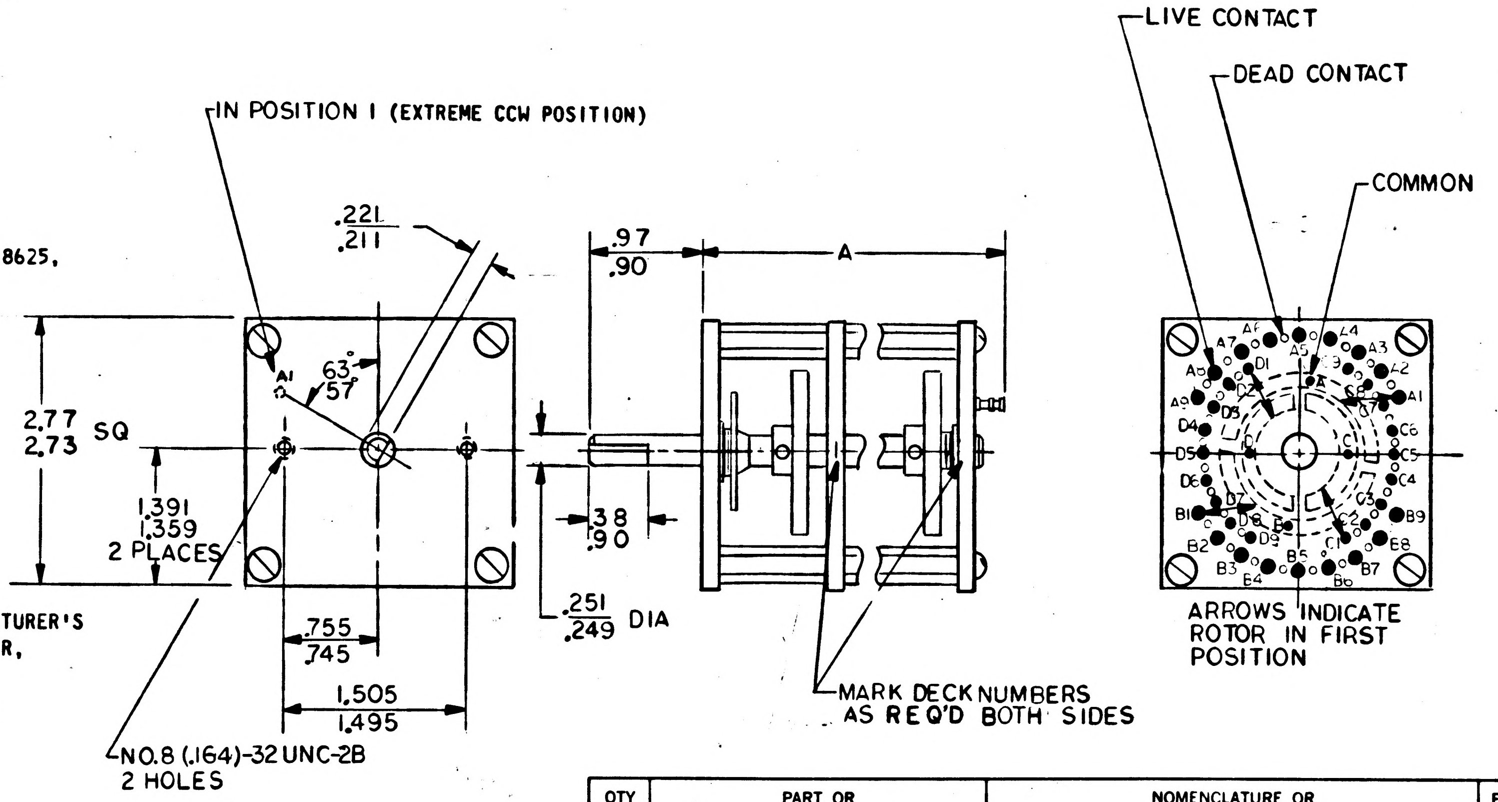
REVISIONS

SYM	DESCRIPTION	DATE	APPROVED

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE FOUR POLE, 9 POSITION, 15° INDEX, NON-SHORTING, ROTATION LIMITED TO 120° BY STOPS, FLATTED SHAFT, SEE TABLE I FOR DECKS.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITH SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: PER TABLE I.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 50 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK NUMBER: SHALL BE MARKED IN NUMERICAL SEQUENCE STARTING FROM THE SHAFT END.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01384 DATE 5/28/63



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Pruniee DATE 2 MAY 63
CHECKED W. J. Gifford [illegible] 8 MAY 63
APPROVAL [illegible] 5/21/63
APPROVAL [illegible] 5/21/63
APPROVAL [illegible] 5/21/63
NASA APPROVAL Jack Barnard
MIT APPROVAL [illegible] 5/29/63
MIT APPROVAL W [illegible] 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY
9 POSITIONS / POLE, 4 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006894
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE TWO POLE, 6 POSITION WITH ADJUSTABLE STOPS PRESET AS SPECIFIED IN TABLE I, 30° INDEX, NON-SHORTING, ROTATION LIMITED BY STOPS, FLATTED SHAFT.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 100 INCH-OUNCES, MAXIMUM.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END.
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4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

TABLE I

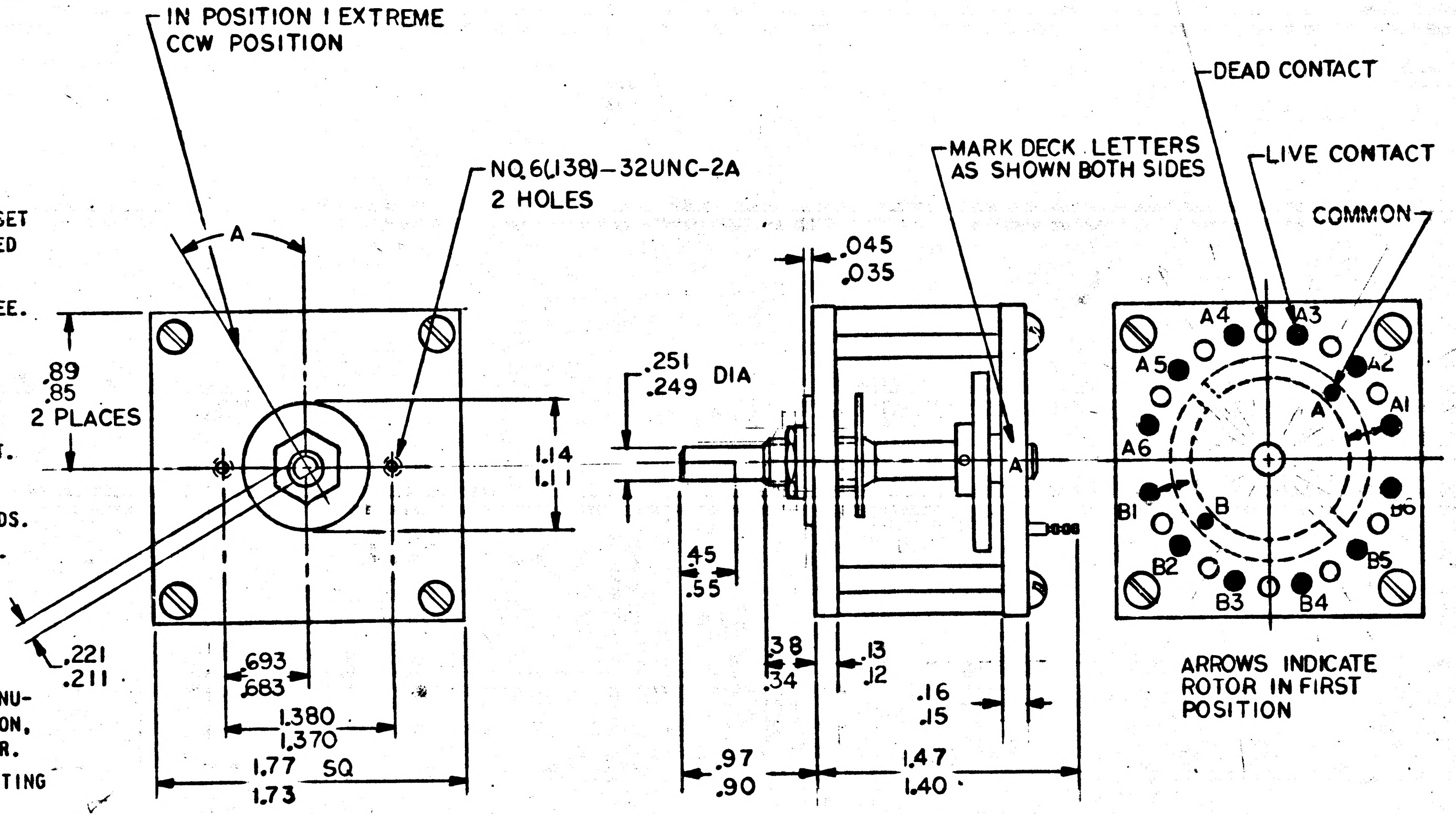
DASH NUMBER	NO. OF POSITIONS	NO. OF DECKS	DIMENSION A
-1	2	1	15°
-2	3	1	30°

(M)

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–			
A	CLASS II CHANGE PER RD-R5287A DR Ray Wheeler CHK J. Ruggeri APPD H. Maynard	7/12/63	JS
B	REVISED PER TDRR 04301 DR S. Orifice CHK J. Logan APPD H. Maynard	12/10/63	

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01384 DATE 5/29/63



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Pusinig DATE 7MAY63
CHECKED Donald S. Yelsky 9 MAY 63
APPROVAL J. Kasgusk 5/31/63
APPROVAL A.D. Dempsey J.S. 5/21/63
APPROVAL E. Sitton 5/21/63
NASA APPROVAL Jack Brown
MIT APPROVAL 5/29/63
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
6 POSITIONS / POLE, 2 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006895
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 2 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: .004 OHMS NOMINAL (.010 OHMS MAX INITIAL) AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
     - (2) 70,000 FEET: 450 VOLTS RMS.
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE TWO POLE, 6 POSITION WITH ADJUSTABLE STOPS PRESET AS SPECIFIED IN TABLE I, 30° INDEX, NON-SHORTING, ROTATION LIMITED BY STOPS, FLATTED SHAFT.
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   - E. CONTACT AREAS: SHALL BE TREATED WITH A HIGH MOLE ESTER LUBRICANT.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 100 INCH-OUNCES, MAXIMUM.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK LETTER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
     - (1) DECK LETTER: SHALL BE MARKED IN ALPHABETICAL SEQUENCE STARTING FROM THE SHAFT END.
3. ~~UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.~~
4. THE SUPPLIER SHALL CONFORM TO MIL-Q-9858
5. PREPARATION FOR DELIVERY PER ND 1002215.

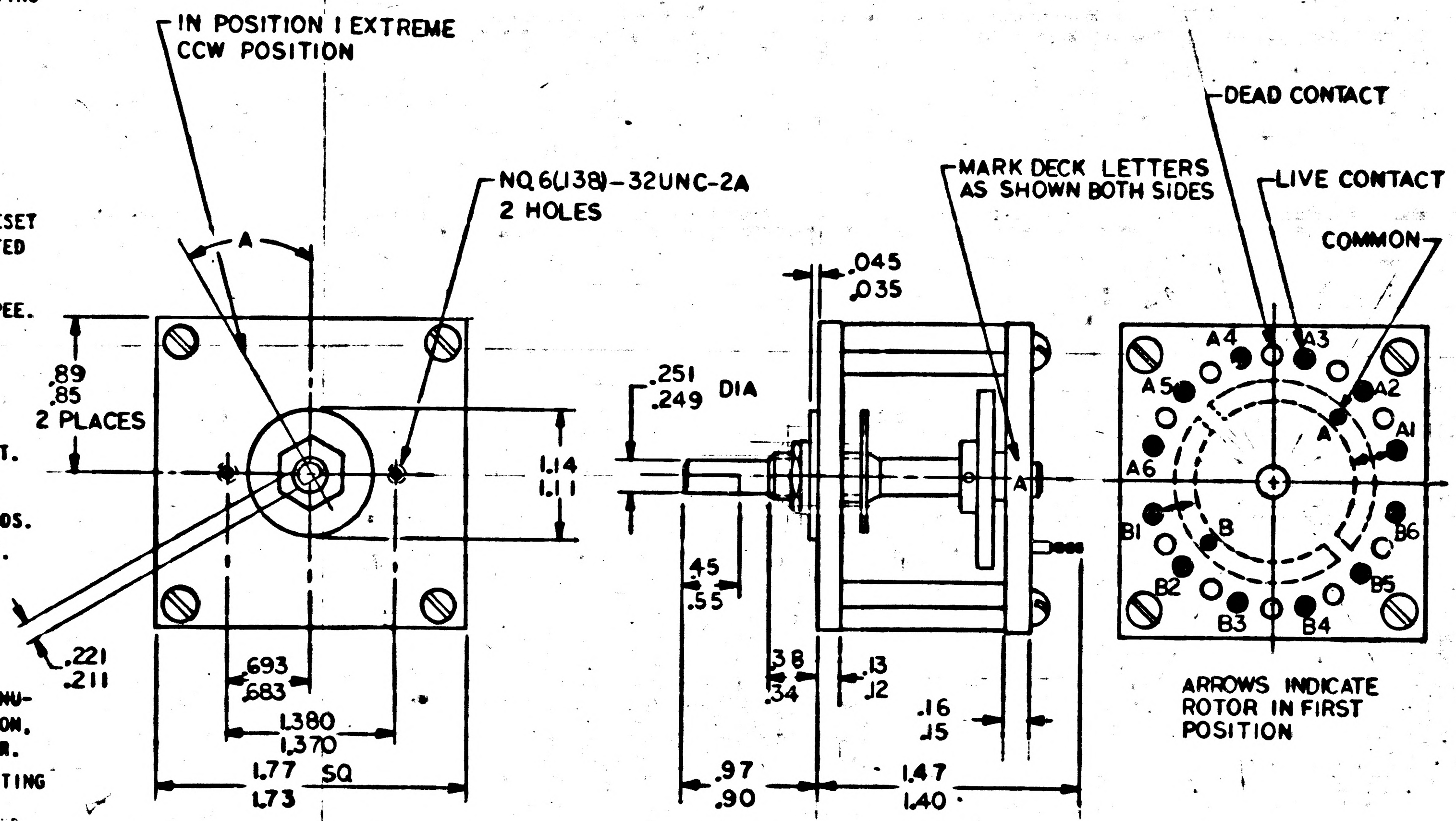
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

TABLE I

DASH NUMBER	NO. OF POSITIONS	NO. OF DECKS	DIMENSION A
-1	2	1	15°
-2	3	1	30°

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
–	RELEASED PER TDRR NO. 01394		
A	CLASS II CHANGE PER RD-R5287A DR Ray W Scales CHK J. Rogan APPD A. Maynard	9/12/63	
B	REVISED PER TDRR 04301 DR CHK APPD A. Maynard	12/10/63	
C	UPGRADE TO CLASS A WITH CHANGE PER TDRR 16750 DR R Dubois CHK APPD A. Maynard	3/11/65	KED



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTES

HEAT TREATMENT

FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN DATE 7MAY63
CHECKED 9 May 63
APPROVAL 5/21/63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
6 POSITIONS / POLE, 2 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006895
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED

TABLE I

DASH NUMBER	NO. OF POSITIONS	NO. OF DECKS	DIMENSION A
-1	2	1	15°
-2	3	1	30°

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01384 DATE 5/29/63

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-S-3786 AND THE ADDITIONS OR EXCEPTIONS SPECIFIED HEREIN.
   - B. CURRENT RATING (BREAKING): 5 AMPERES MAXIMUM AT 115 VOLTS RMS, 60 CYCLES, RESISTIVE LOAD.
   - C. CURRENT RATING, CONTINUOUS (NO-BREAKING): 10 AMPERES RMS MAXIMUM.
   - D. CONTACT RESISTANCE: 4 MILLIOHMS MAXIMUM AT 100 MILLIAMPERES WHEN A POTENTIAL OF 2 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - E. CAPACITANCE; CONTACT-CONTACT, CONTACT-SLIP RING: 2.5 PICO FARADS MAXIMUM.
   - F. DIELECTRIC STRENGTH: THE SPECIFIED POTENTIAL SHALL BE APPLIED BETWEEN ALL CURRENT CARRYING PARTS AND BETWEEN ALL CURRENT CARRYING PARTS AND THE METAL PANEL AND SHAFT.
     - (1) SEA LEVEL: 1500 VOLTS RMS.
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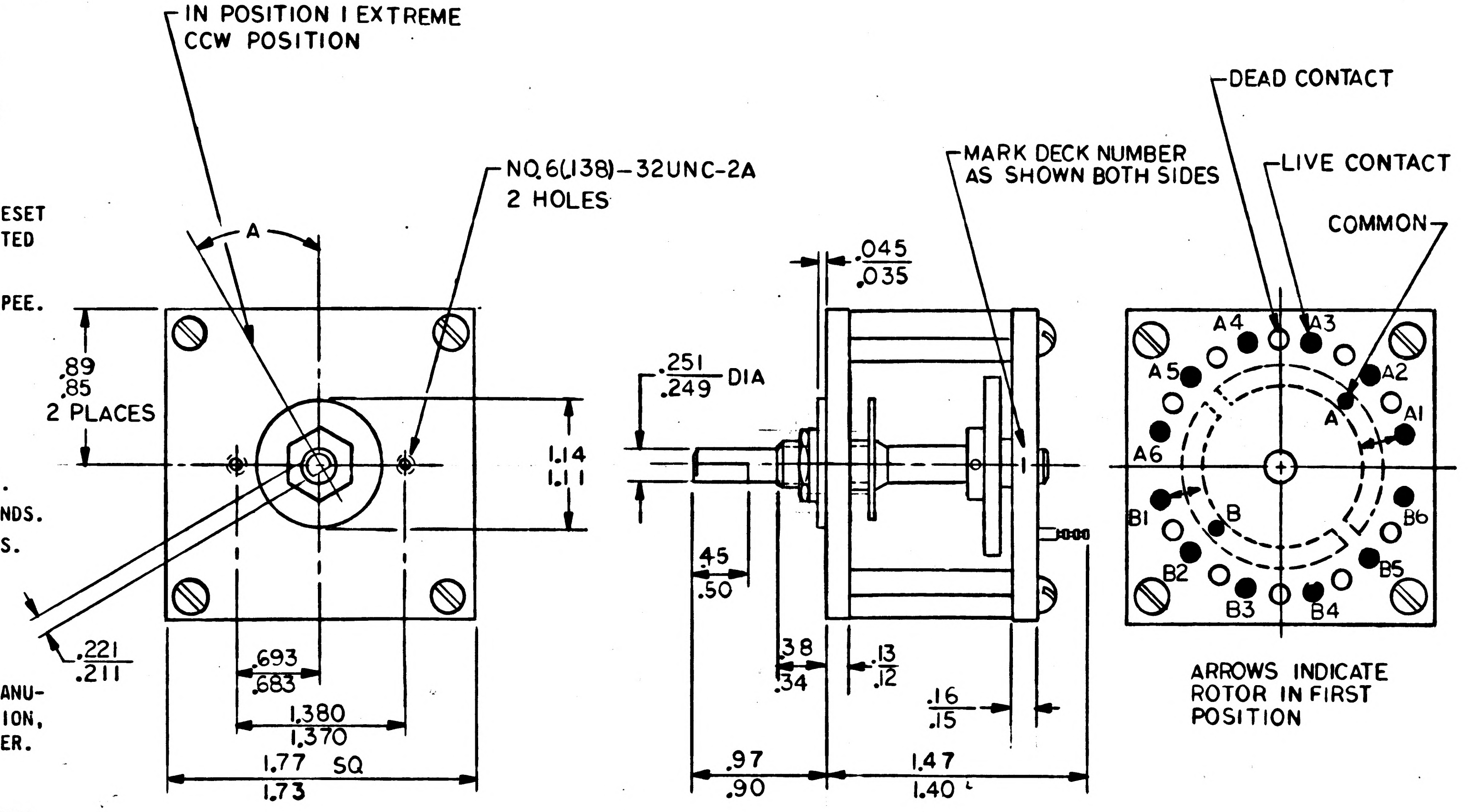
   - G. INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 1000 VOLTS DC SHALL BE APPLIED AS SPECIFIED IN DIELECTRIC STRENGTH.
2. CONSTRUCTION REQUIREMENTS:
   - A. SWITCH: SHALL BE TWO POLE, 6 POSITION WITH ADJUSTABLE STOPS PRESET AS SPECIFIED IN TABLE I, 30° INDEX, NON-SHORTING, ROTATION LIMITED BY STOPS, FLATTED SHAFT.
   - B. TERMINAL BOARD: EPOXY RESIN, PAPER BASE PER MIL-P-22324, TYPE PEE.
   - C. PANEL: ALUMINUM ALLOY PER QQ-A-355C, TEMPER T3, ANODIZED PER MIL-A-8625, TYPE 1.
   - D. WIPER BLADES: SHALL BE MULTILEAF TYPE.
   - E. CONTACT AREAS: SHALL BE TREATED WITH A LITHIUM BASE GREASE.
   - F. TERMINALS: SILVER ALLOY (90% SILVER, 10% COPPER), GOLD FLASHED.
     - (1) PULL: FIVE (5) POUND AXIAL PULL WITHOUT SHOCK FOR 10 SECONDS.
     - (2) TERMINALS SHALL ACCOMMODATE TWO #20 AWG STRANDED CONDUCTORS.
   - G. SWITCHING TORQUE: 100 INCH-OUNCES, MAXIMUM.
     - (1) STOPS, MECHANICAL: SHALL WITHSTAND 20 INCH-POUNDS.
   - H. ENDURANCE: 10,000 CYCLES PER MIL-S-3786.
   - I. MARKING: EACH UNIT SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, DECK NUMBER, NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
3. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
4. THE SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.



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RAYTHEON
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN H. Prunier DATE 7MAY63
CHECKED D. Lindell S. Yelsey 9 MAY 63
APPROVAL John Kaspick 5/21/63
APPROVAL A.D. Dempsey 5/21/63
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NASA APPROVAL Jack Barnard
MIT APPROVAL 5/29/63
MIT APPROVAL 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY, ADJUSTABLE
6 POSITIONS / POLE, 2 POLES / DECK
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006895
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

5 4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

ANY USE OF THIS DOCUMENT FOR OTHER THAN GOVERNMENTAL PURPOSES IS SUBJECT TO PRIOR WRITTEN CONSENT OF RAYTHEON CO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR		

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNITS SHALL BE CAPABLE OF CONFORMING TO THE REQUIREMENTS OF MIL-B-23071, TYPE FC1R6C11A, WITH THE EXCEPTIONS AND PARTICULAR REQUIREMENTS SPECIFIED BELOW.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, ON THE REAR SURFACE, WITH THE NASA PART NUMBER (DRAWING NUMBER, DASH NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE NASA PART NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, AND DATE OF MANUFACTURE. OTHER MARKING MAY BE APPLIED, BUT THE UNIT SHALL ONLY BE MARKED ON THE REAR SURFACE.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) AIR FLOW CHARACTERISTIC: WITH FILTER ELEMENT AND GRILL IN PLACE, THE FAN SHALL DELIVER 300 CFM MINIMUM AT 0.3 INCHES (OF WATER COLUMN) STATIC PRESSURE.
     - (2) MATERIAL AND FINISH: (CERTIFICATION REQUIRED WITH EACH SHIPMENT)
       GRILLE: STEEL, PAINTED WITH ONE COAT OF SEMIGLOSS ENAMEL PER MIL-F-14072. ENAMEL IS TT-E-529, CLASS B, COLOR NUMBER 26440 PER FED-STD-595.
       FLANGE, MOUNTING: STEEL, CADMIUM PLATED PER QQ-P-416, CLASS 2, TYPE II. CHROMATE SHALL BE ELECTRICALLY CONDUCTIVE.
       AIR FILTER: ALUMINUM MESH IN AN ALUMINUM FRAME ALL CHROMATED PER MIL-C-5541.
       BLOWER BOX: STEEL, PAINTED SEMIGLOSS LIGHT GRAY ENAMEL PER MIL-F-14072, P211, FILM E.
     - (3) RECEPTACLE CONNECTOR: MS 3112E-16-8P.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) POWER CONSUMPTION (MAXIMUM): 3.0 AMPERES AT 115 VRMS, 60 CPS, SINGLE PHASE WHILE RUNNING.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS CONTINUOUS DUTY MINIMUM AT ROOM TEMPERATURE AND HUMIDITY.
   - B. STORAGE LIFE: 1 YEAR MINIMUM.
   - C. CONSTRUCTION: CENTRIFUGAL BLOWER MOUNTED IN A METAL CASE DESIGNED TO FIT STANDARD 19" RACKS.
     INLET AIR IS FILTERED BY A VISCOUS-IMPINGEMENT TYPE, WASHABLE ELEMENT. THE FILTER SHALL REMOVE 85% OF DUST PARTICLES 5 MICRONS AND LARGER.
   - D. RF INTERFERENCE: UNITS SHALL BE CAPABLE OF ATTENUATING RF ENERGY 100 DECIBELS IN THE 15 KC TO 10 K MC RANGE. THE UNIT WILL NOT GENERATE RF ENERGY IN ACCORDANCE WITH MIL-I-16910, CLASS III.

ORIGINAL SOURCE OF SUPPLY:

MCLEAN ENGINEERING LABORATORIES
PRINCETON JUNCTION, NEW JERSEY
CODE IDENT NO.
PART NUMBER R2EB412AR30

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 02911 DATE 9-5-63

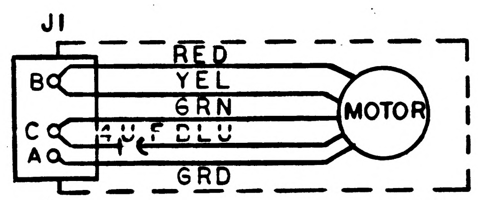
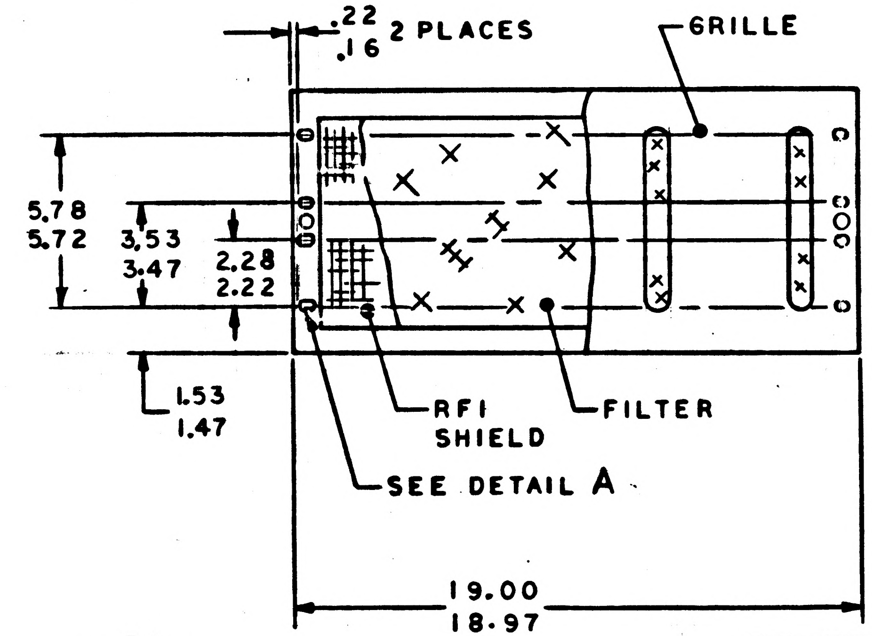
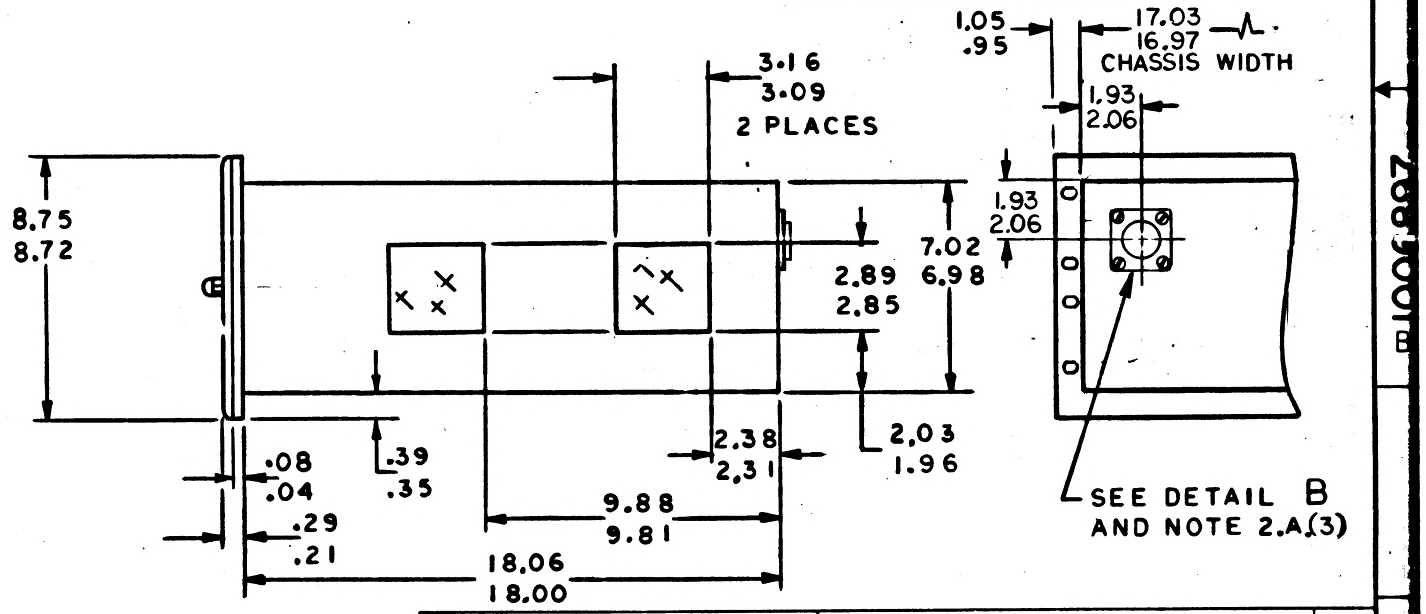
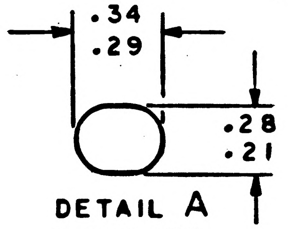


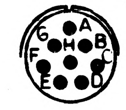
FIG. 1
WIRING DIAGRAM







DETAIL A
8 PLACES



DETAIL B

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN C. Carapi DATE 5 Aug 63
CHECKED J. Ruggiero 9 Aug 63
APPROVAL C. Sperling 19 Aug 63
APPROVAL 8/23/63
APPROVAL 8/19/63
NASA APPROVAL 9/5/63
MIT APPROVAL L. Gedimin 9/4/63
MIT APPROVAL 9/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FAN, VENTILATING,
RFI SHIELDED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006897
SCALE NONE
WT
SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1006897

5 4 3 2 1

INCHES
0 1 2
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DASH NO.	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11
LEGEND	MONITOR	TAPE LOAD	TAPE VERIFY	KEYBOARD LOAD	READ-AGC	TRANSFER CONTROL	RECORD	TAPE PREPARE	TAPE DUPLICATE	TAPE UP-LINK	MANUAL UP-LINK

TABLE I

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASE PER TDRR 02692		
A	CHANGED PER TDRR 03819 DR Roy Wheeler CHK J Ruggeri APPD H Maynard	12/63	WK

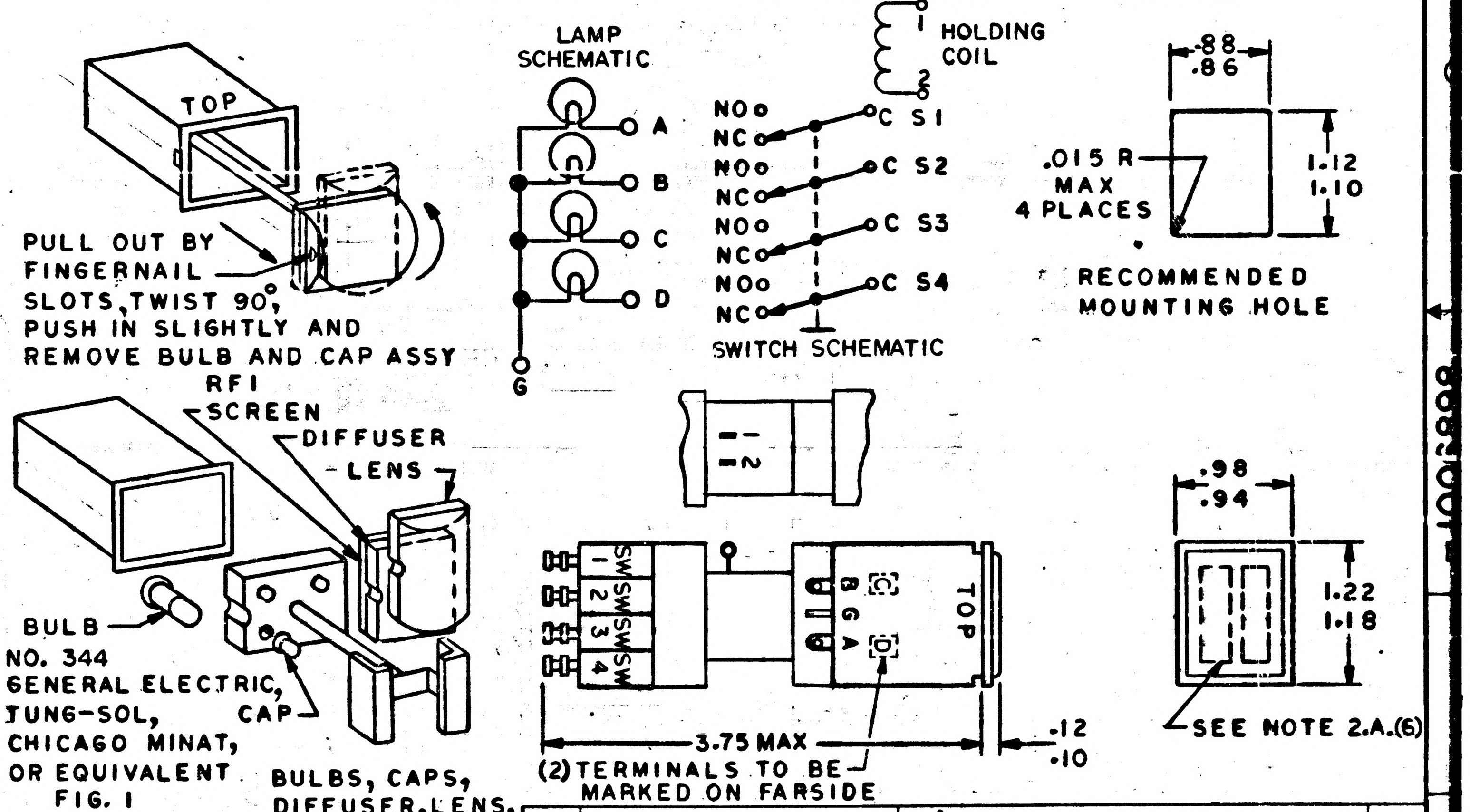
NOTES:

1. GENERAL REQUIREMENTS:
   - A. SWITCHES SHALL MEET THE REQUIREMENTS OF MIL-S-6743.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.
   - C. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - D. MARKING AND PACKAGING:
     - (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER AND DASH NUMBER), TERMINAL IDENTITY, SCHEMATIC, AND UNIT ORIENTATION.
     - (2) PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, AND THE NASA PART NUMBER. OTHER IDENTIFYING MARKS ARE PERMISSIBLE.
   - D. AMBIENT OPERATING TEMPERATURE RANGE: -65°C TO +71°C.
   - E. RATINGS FOR SWITCHES (AT SEA LEVEL)
     - (1) 125/250 VRMS, 60 CPS: 5 AMPERES
     - (2) 30 VDC, RESISTIVE: 5 AMPERES
     - (3) 30 VDC, INDUCTIVE: 3 AMPERES
     - (4) MAXIMUM INRUSH: 24 AMPERES
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (SAMPLING)
   - A. MECHANICAL PROPERTIES:
     - (1) TERMINAL STRENGTH: ALL TERMINALS SHALL WITHSTAND A 5 POUND AXIAL PULL FOR 5 SECONDS WITH NO PHYSICAL DAMAGE. THIS FORCE TO BE APPLIED WITHOUT SHOCK.
     - (2) TERMINAL FINISH AND SIZE: TERMINALS SHALL BE TINNED TO FACILITATE SOLDERING AND SHALL ACCOMODATE (2) TWO NO. 20 AWG STRANDED CONDUCTORS.
     - (3) OPERATION: THE FOUR SWITCHES SHALL BE MOMENTARILY ON WHEN THE FRONT LENS IS DEPRESSED WITH A FORCE BETWEEN 2 AND 5 POUNDS. THEY SHALL REMAIN ON IF THE HOLDING COIL CIRCUIT IS ENERGIZED WHEN THE LENS IS RELEASED AND WILL RETURN TO THE NORMAL POSITION WHEN THE HOLDING COIL IS DE-ENERGIZED.
     - (4) ASSEMBLY AND DISASSEMBLY: BULBS AND COLORED BOOTS CAN BE REPLACED BY REMOVING THE FORWARD ASSEMBLY (SEE FIGURE 1). FIVE POUNDS MAXIMUM PULL AND 100 INCH-OUNCES MAXIMUM TWIST ARE REQUIRED TO REMOVE THE ASSEMBLY.
     - (5) BULB BOOT COLOR: AMBER. (LOW INTENSITY)
     - (6) LEGEND: 1/8 HIGH ENGRAVED CHARACTERS FILLED BLACK IN THE CLEAR LENS REAR SURFACE AND CENTRALLY LOCATED. SEE TABLE I.
     - (7) LENS AND DIFFUSER: MILK WHITE ACRYLIC DIFFUSER AND CLEAR LINES.
     - (8) RFI SCREEN
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) SWITCH CONTACT ARRANGEMENT: SPDT (NC, MOMENTARY ON)
     - (2) SWITCH CONTACT VOLTAGE DROP: 1 MILLIVOLT MAXIMUM AT 100 MILLIAMPERES AND 2 TO 4 VOLTS THROUGH A SUITABLE DROPPING RESISTOR.
     - (3) HOLDING COIL DISSIPATION: 3 WATTS MAXIMUM AT 12 VDC.
     - (4) HOLDING COIL RESISTANCE: 92 OHMS ± 10%.
     - (5) DIELECTRIC WITHSTANDING VOLTAGE: 1000 VRMS.
     - (6) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM AT 500 VOLTS DC.
3. DESIGN REQUIREMENTS (AT 25°C UNLESS SPECIFIED)
   - A. OPERATING LIFE: BULBS; 750 HOURS MINIMUM AT 12 TO 14 VOLTS AND 80 MILLIAMPERES. AT +71°C AMBIENT TEMPERATURE BULBS SHALL LAST 48 HOURS MINIMUM. SWITCHES; 100,000 OPERATIONS MINIMUM.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT MECHANICAL OR ELECTRICAL DETERIORATION.
   - C. CONSTRUCTION: CURRENT CARRYING PARTS SHALL BE SILVERPLATED PER QQ-S-365. ALL OTHER METAL PARTS SHALL BE CORROSION-RESISTING STEEL. PLASTIC PARTS SHALL BE FUNGUS-RESISTANT.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 02692 DATE 8/21/63



TOP
PULL OUT BY FINGERNAIL SLOTS, TWIST 90°, PUSH IN SLIGHTLY AND REMOVE BULB AND CAP ASSY
RFI SCREEN
DIFFUSER
LENS
BULB NO. 344 GENERAL ELECTRIC, TUNG-SOL, CHICAGO MINAT, OR EQUIVALENT
CAP
LAMP SCHEMATIC
A
B
C
D
G
HOLDING COIL
1
2
NO
NC
C S1
C S2
C S3
C S4
SWITCH SCHEMATIC
.88
.86
.015 R MAX 4 PLACES
1.12
1.10
RECOMMENDED MOUNTING HOLE
1
2
SW 1
SW 2
SW 3
SW 4
B
G
A
TOP
.98
.94
1.22
1.18
3.75 MAX
.12
.10
(2) TERMINALS TO BE MARKED ON FARSIDE
SEE NOTE 2.A.(6)

FIG. 1

BULBS, CAPS, DIFFUSER, LENS, AND SCREEN MAY THEN BE REMOVED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES ON
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DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
FINAL FINISH

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RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN DATE
CHECKED J Ruggeri
APPROVAL
APPROVAL 8/13/63
APPROVAL
NASA APPROVAL 8/20/63
MIT APPROVAL 8/21/63
MIT APPROVAL 20 Aug 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH (DISPLAY LIGHTS & HOLDING COIL)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1006898
SCALE NONE
WT
SHEET 1 OF 1

INCHES
0 1 2
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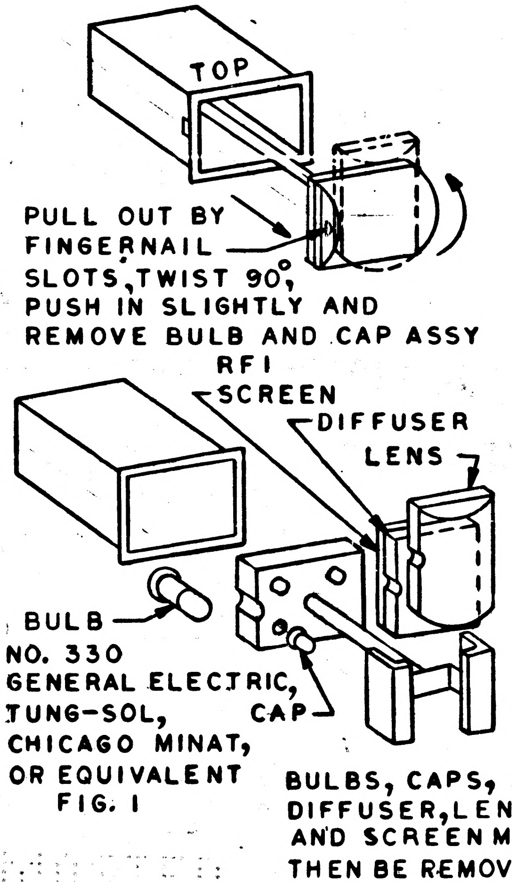
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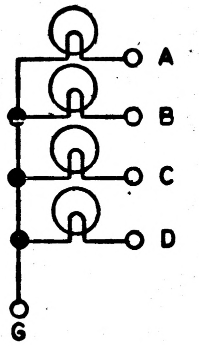
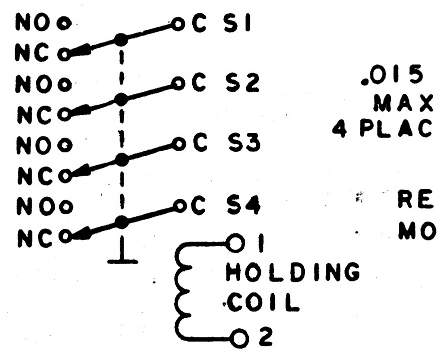
BULB
NO. 330 GENERAL ELECTRIC, TUNG-SOL, CHICAGO MINAT, OR EQUIVALENT
CAP
BULBS, CAPS, DIFFUSER, LENS, AND SCREEN MAY THEN BE REMOVED

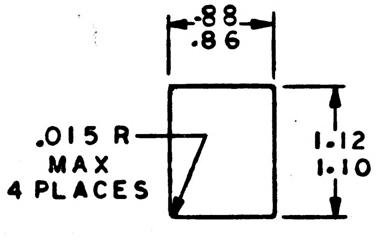
FIG. 1



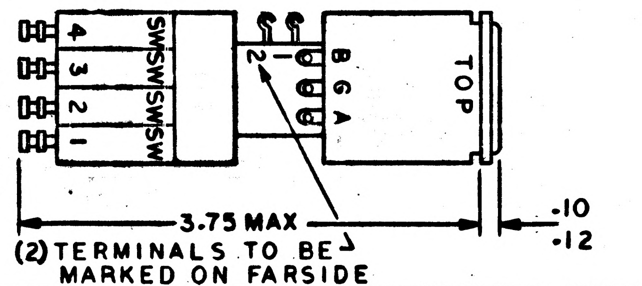
LAMP SCHEMATIC

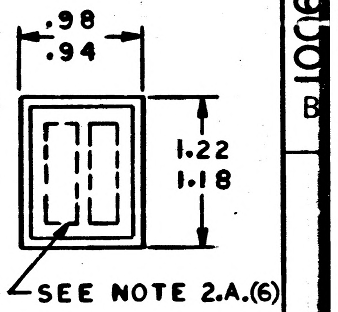


SWITCH SCHEMATIC



RECOMMENDED MOUNTING HOLE





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RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO.
DRAWN C. Crespi DATE 22 July
CHECKED
APPROVAL
APPROVAL 8/13/63
APPROVAL
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63
MIT APPROVAL 20 Aug 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH
(DISPLAY LIGHTS & HOLDING COIL)
SPECIFICATION CONTROL DRAWING

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